



PROCEEDING OF

2nd Student National Symposium

IR 4.0 (SNSIR 4.0) Webinar

14th June 2020

 <https://academicservices.hct.edu.om/ijicse/>
Information Technology Department
Higher College of Technology
Muscat -Oman



More Information



<http://www.hctsymposium.com/>

Foreword

Under the present unprecedented pandemic condition most of the colleges have suspended travels and cancelled classes altogether. Hence keeping motto “CHANGE FOR BETTER” the Symposium which was originally scheduled to be held at the Higher College of Technology Campus was rescheduled as a digital Symposium.

HCT continues a tradition of bringing together students, researchers, academics and professionals from all over the world, experts from multidisciplinary fields with hands-on experience in technological advancements with the goal of innovation and the transition to new business models and revenue sources with information and services as cornerstones.

The symposium particularly encouraged the interaction of research students and developing academics with the more established academic community in an informal setting to present and to discuss new and current work. Their contributions helped to make the symposium as outstanding as it has been. The papers contributed the most recent scientific knowledge known in the field of Machine Learning & AI, IoT, Block Chain, System Securities, Big Data and other various current trends in Information Technology.

Fusion of these technologies and interaction across the physical, digital and biological domains make IR 4.0 fundamentally different from previous revolutions. The symposium successfully covered all the six building blocks of the IR 4.0 such as Industrial Success Skills, Industrial Equipment and Technology, Smart Sensors and Smart Devices, Control Systems, Connectivity and Networking, Inform-Actionable Data.

HCT believes that addressing each such block in appropriate complexity at progressive levels of education becomes integral to producing a career-ready individual who possesses the right combination of skills and abilities needed by today’s advanced manufacturing companies.

A number of research papers, posters and workshops had been delivered. Keynote speakers and panel discussions had stimulated scholastically and technically stirred smart discussions.

Although we are in the second symposium, we have witnessed that the significant growth of submission of articles has increased cent percent compared to SNSIR 4.0’ 2019. This symposium represents the great efforts of many people of HCT. We want to express our gratitude to the members of the General Chair, Program Chair, Publication Committee and the Reviewers for their hard work in reviewing submissions. The Heads of various Institutions and Committees also helped us in many ways, for which we are grateful.

THE PROCEEDINGS

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Finally, the conference would not have been possible without the excellent papers contributed by the authors. The authors of the papers submitted, come from different educational institutions, industry and government organizations. We thank all the authors for their contributions and their participation in SNSIR 4.0' 2020!

Hope the proceedings will furnish the research community of the world, with an excellent reference book. We also trust that this will be an impetus to stimulate further study and research in Oman in different areas.

“LAST BUT NOT THE LEAST” we would like to thank all the attendees for sparing their valuable time and contribution towards this symposium.

With best wishes,

Editorial Committee, SNSIR4.0 2020

Research Papers

[1] **Title of Paper: Advanced Weather Monitoring System**

Author(s): Abdillah Said Salim

Affiliation: Higher College of Technology, Muscat

Abstract: *Advance weather monitoring system with IOT is the device which measures the environmental states of your home area. These climatic conditions including temperature, atmospheric pressure, humidity, rain value which are fundamental to be checked as often as possible because of their high significance which could help caution us about certain circumstance which is going to occur or would assist us with arranging our everyday exercises. The device is able to monitor the atmospheric condition of a location which the device is located and if there are any deviations in the reading such as high increasing of the temperature or rain detection, the system will automatically send a message to the owner of the device and thus the owner can control several automations features by using his mobile to prevent his home from the harm of this weather abnormalities. This system uses the Raspberry Pi 3 as its main processing unit and the cerebrum of the entire prototype. The raspberry Pi is interfaced with multiple sensors which monitors each of the weather parameters. These sensors are DHT11, BMP180, Rain value sensor, UV sensor and LDR. In addition, to control the automation actions and the message notifications of the system to the owner an Arduino UNO is used. This device is interfaced with the GSM module for messaging the owner if there are any abnormalities to the system and it controls the relay module which facilitates the automation in the owner's house. Never the less, a renewable power system is interfaced with this design for powering the main processing unit of the prototype. Renewable Energy is the energy that can be harnessed and used continuously without being obsolete. Solar Energy as a form of renewable energy which is utilized and collected by solar panel sufficient enough to power a rechargeable battery which will constantly power the device. Furthermore, for big data analytics as among the purposes of Internet of things, data which is read from the prototype is continuously recorded with their elapse of time and their instantaneous values for each of the parameters. This continuous collection of data over a long period of time could help forecast and predict the weather patterns of the future and would increase efficiency of the forecasting of weather in the surrounding area.*

[2] **Title of Paper: Inventory Management Portal**

Author(s): Shamsa Ali Abdullah Ali Al-Musharafi

Affiliation: Ibra College of Technology

Abstract: *This project we are trying to make inventory management system which will help employees to keep record of inventories in systematic way and help them produce report about the inventory or stock currently available in their department in automatic way to help then decision making about the stock.*

[3] **Title of Paper: A competitive study in security and policy of social media on mobile phone.**

Author(s): Nidaa Hilal Abdullah Al-Shanfari

Affiliation: Salalah College of Technology

Abstract: *Smart phone every day changing, every day we have new technology, new system and new policy. On other hand we have new hackers, various and malware. When you have a smart device that it is not enough; many users install social media that make it you be in dangers way. However, social media ask you in their policy to write your personal data to log in (e- mail, name, number, address) also they ask you to enable to access camera, location, photos album and contact. In fact, social media not protect your personal data. In fact, 2.71 billion People in the world own a Smartphone in 2019 [1]. Mobile owners worldwide will increase to 7.33 billion by 2023 [1]. 194 billion mobile phone apps were downloaded in 2019 [1]. That is meaning number of users is increases. Number of people that is download apps is very much bigger than number of people have smart phone. People cannot see the dangers. They not know their personality data is in public not private even if you chose private button. My research paper will show that the policy of application not security.*

[4] **Title of Paper: Employees' Performance Evaluation and Appraisal for SHCT (EPEA-ShCT)**

Author(s): Asma Khalfan Majad Al-Zaabi, Reem Khalfan Said Al-Maktumi, Ahad Hamed Khamis Al-Sinani

Affiliation: Shinas College of Technology

Abstract: *An employee performance appraisal is a process—often combining both written and oral elements whereby management evaluates and provides feedback on employee job performance, including steps to improve or redirect activities as needed. Appraisals are important to help staff members improve their performance and as an avenue by which they can be rewarded or recognized for a job well done. EPEA-ShCT is an online portal that provides simple visual way for employees to update their achievement(s) until a given/ specified Period of time. Once the deadline is over, the staff will not be able to upload/update any information. HOS can view the details of all the staff in his/her respective section. Hos or QA Coordinator also must update the Student Evaluation on Teacher (SET) mark of each staff. HOS can include Feedback/comments/appreciations for each staff. HOD can view the details of all the staff in his/her respective department. HR can View the details of all the staff in the college. They can generate report and can initiate to process best faculty in each department.*

[5] **Title of Paper: Smart Video-Based Sign Language App: Impacts On Communication For Deaf And Dumb Individuals**

Author(s): Rayan Nasser Al-Wahaibi, Noora Khalifa Sultan Al-Rabei, Fatma Said Al-Abri

Affiliation: Shinas College of Technology

Abstract: *Communication is the important means for everyone to remain actively updated with the world around us. Communication is vital means of transferring information. For any individual, communicating effectively is an important skill. There are different groups of people in the world around us. Some people are differently abled and are deaf and dumb. Communicating verbally is really a great challenge for these people. Deaf and dumb people they have their own language (sign language) and they can communicate with each other,*

but deaf and dumb people cannot communicate with normal people because they don't understand sign language and vice versa. This makes them feel an unimportant part of society, also they face many problems, and they do not know how to face it because others do not understand them. To address this issue of communication for the Deaf & Dumb people with society around them, this research propose an application that would assist in communication between these two parties. This application will help common people to understand the sign language used by deaf and dumb people. Therefore, deaf, and dumb people can communicate with people who do not know sign language without feeling embarrassed.

- [6] **Title of Paper: The Effectiveness of Exam Attendance System (EAS) using Mobile Phone and Quick Response (QR) Code for Shinas College of Technology**
Author(s): Khaloud Hamed Rashid Almaamari, Amina Sultan Said Al Badi
Affiliation: Shinas College of Technology

Abstract: *The research project aims to develop a system and to find out the Effectiveness of Exam Attendance System using Mobile Phone and Quick Response (QR) Code for Shinas College of Technology. It would like to determine the problems encountered in attendance checking during the examination by the staff and the effects to the students when they are asked to sign in the attendance sheet during the examination and finally to assess the effectiveness of the propose system in terms of ease of use, reliability, responsiveness and availability of devices. The propose system will have mobile application which will be used in taking the attendance of students during examination and a web-based application to manage users, exam scheduling and generating needed reports. An initial survey was conducted for the students and invigilators to find out the effects to the student when signing in the attendance sheet and the problems encountered by the students and staff during the examination. The initial survey results illustrate that there is indeed effects and problems to the student when they are asked to sign in the attendance sheet during examination such as they lose their focus or concentration, their time is wasted, annoyed and disturbed. They also encounter problems such as signing in a wrong name; their name is missing and forgot to write their computer number. Invigilators find themselves dividing their attention during examination due to tasks that are repetitive and unnecessary. The researchers believed that the propose system will minimize if not totally eradicate the effects and problems encountered by the students and invigilators. It will also help the intended users and the college to effectively conduct the examinations.*

- [7] **Title of Paper: Smart irrigation system by using IoT technology**
Author(s): Bushra Rashid Hamed Alhadi
Affiliation: Higher College of Technology, Muscat

Abstract: *Many farmers use large portions of farming land and getting to and monitoring each corner of a huge large land becomes very difficult. There is sometimes the risk of irregular sprinkling of water. It results in crops of poor quality, resulting in further financial losses. The smart irrigation system was developed to optimize water use for agricultural crops. It also helps in conserving water by automatically providing water to the plants/field depending on the water requirements. In this project, using the latest IoT technology, this proposed project aims to change the traditional and classical ways of irrigation system and convert it to smart irrigation system using Internet of Things (IoT) technology and try as much to reduce some of the problems farmers are experiencing using the old ways of irrigating the farm. In this project, a soil moisture monitoring system, will be implemented using the best available and most suitable sensor in the market, to reduce and regulate the amount of water used*

in farming. The purpose of this device is to detect the soil's moisture content and water pump depending on it. All this information will be sent to the cell phone of the user by using GSM module to inform the owner of the farm about the process of irrigation system.

- [8] **Title of Paper: IOT Based Hydroponic System in Greenhouse Farming**
Author(s): Fatma Rashid Ail AL-RUBIEI, Bushra Ahmed Abdul Rahman Al-BALUSHI
Affiliation: Shinas College of Technology

Abstract: *“Our Project title is Hydroponic System using IOT in Raspberry pi platform. The main purpose of our project is to use Hydroponic system with improved controllers and sensors for the growth of plants without soil for better results and improving the quality of plants cost effectively”. This system will provide complete maintenance of the humidity, temperature and pH level of the water used for growing the plants and it will be comfortable to farmer by reducing their work on greenhouse from outside the greenhouse. The most important perspective for the plant’s growth with quality and productivity is water, air, temperature and humidity. In this project we use Humidity and Temperature sensor, pH level sensor, water level sensor. The software we are using is python which provides the space for coding in Raspberry pi.”*

- [9] **Title of Paper: Supervised Machine learning approach for Credit Card Fraud detection based on Neural Network**
Author(s): Binte Marium
Affiliation: Waljat College of Applied Sciences

Abstract: *Payment in the form of bank cards has been on an increase in the last few years. Companies have also followed the technological trends and shifted to providing more online services such as e-commerce, information, and communication. Though it is convenient for the customers, it also increases the potential security threats. Over the last few years, credit card frauds have increased in number and are only believed to increase, leading to huge losses of money. The frauds tend to follow certain patterns that can be studied. The proposed neural network architecture is based on a class of feed-forward artificial neural network known as Multi-Layer Perceptron (MLP) classifier. An MLP classifier contains an activation function, weight optimization algorithm and one or more hidden layers. Our model detects these frauds by using a neural network with Adam as the adaptive learning rate optimization algorithm. The developed system operates on a dataset comprising of credit card transaction details to detect fraudulent transactions. This algorithm is a supervised learning technique with backpropagation as a way of fine-tuning the weights of a neural network based on the error rate obtained in the previous iterations. Hence generalizing the model and lowering the error generated. Our system has higher efficiency as it produces high detection rates, high accuracy and it is also suitable to work with huge datasets. Since nowadays time and costs are the highest priorities in every field, the model generates the output at a rate that is time and cost-efficient.*

- [10] **Title of Paper: Evaluating the effect of Smartphone on HCT female Student**
Author(s): Aya Abdul Aziz Sulaiman Al-Maawali, Kauthar Rashid Al-Hashmi
Affiliation: Higher College of Technology, Muscat

Abstract: *Worldwide, smartphones were used by 1.85 billion people in 2014. This number is expected to be 2.32 billion in 2017 and 2.87 billion in 2020 (Statista, 2017). As possession and accessibility to mobile smartphones became omnipresent, therefore has the necessity for analysis into the implications,*

like positive and negative academic Performance. Recent analysis suggests high screen media usage is related to poor sleep and diminished educational performance among college student. While Smartphone use has been increasing all across economic and age sectors, college students have been seen as one of the most important target markets and the largest consumers group of smartphone services. The technological revolution has provided the world with many inventions. However, every invention has brought with it both comforts and problems. Smartphones provide many conveniences in our life, however people need to be aware of the negative effects of smartphone use, the foremost regarding facet being smartphone addiction. Smartphone addiction may be a development that pertains to uncontrollability of smartphone use. folks with this drawback encounter social, psychological, and health issues.

[11] **Title of Paper: IoT based Application for Monitoring Warehouses**

Author(s): Amira Ali Salem Al Fazari, Mahra Said Al-Risi

Affiliation: College of Applied Science, Sohar

Abstract: *Due to the development of logistics and supply chain, daily management of warehouses encounters some problems, namely: the quality of products in the warehouse might be affected greatly by environmental parameters in the warehouse such as temperature, humidity, the degree of light, and other environmental parameters. Nowadays, warehouse environment management tends to be more instant, precise, and intelligent. Checking an online warehouse air quality from the emission of some potentially toxic gas emission is not addressed here in Oman. Therefore, this paper is seeking to design a web application to detect toxic gases in the warehouse and become environmentally friendly and affordable titled Aircom. The proposed system has a unique feature in which IoT technology embedded in its construction. Thus, the main parts set in its architecture are Arduino UNO and ESP8266 Wi-Fi for data processing and transmitting as well as a set of microsensors for sensing environmental data. The suggested microsensors will collect 14 parameters of air quality. All the collected data can be viewed later via the designed web application. An alert will be sent by the system instantly in case the level of air's parameters reaches above the average level. For further verification of our proposal, we employed a quantitative study to check if what we proposed will have a positive impact among different samples in the society. The results show that the proposed system gave a good indicator about air parameters measurements and represents a significant contribution to environmental warehouse management study. An experimental test of the Aircom' sensor has been made and the obtained results gives excellent performance in terms of measuring air parameters and might represent a significant impact on warehouse environments study.*

[12] **Title of Paper: IoT based smart vehicle**

Author(s): Fatma Al Salti, Alanood Juma Salem Al Maskari,

Affiliation: College of Applied Science, Sur

Abstract: *Indeed, the parent community is very much worried about the safety of their children while traveling in a school bus. The reason is due to the recent drastic increase in the number of unwelcome incidents like kids locked or leftover inside, over speed/rash driving, difficulty in tracking the School bus, difficulty in handling the emergencies like accidents, breakdowns, etc. A lot of researches done over these issues and solutions proposed, unfortunately still, there are so many issues leftover without address. The proposed system overcomes the drawbacks of the existing systems like limited SMS notifications, manual checking of children's presence, inadequate emergency management system, students movement tracking through CCTV cameras, absence of front and rear distance monitoring, lack of pollution control systems, absence of communication from the parents to the system. The*

proposed method includes an effective GPS monitoring system, an increased number of SMS notifications to the parents, an automatic counting system, an effective emergency management system to handle the unexpected incidents like accidents, fire, and natural disasters. The proposed system effectively handles emergencies by enabling a realtime communication with the local ROP, ambulance service, hospital emergency service, fire service, and School management based on the incident. The proposed system also monitors the movement of the students without destroying the driver's attention and continuously monitors the distance of the vehicles in the front and rear and alerts the driver when the range is less and effectively monitors air pollution inside and outside the bus. Our implementation shows, the proposed system is beneficial in handling emergencies and could be easily adaptable.

[13] **Title of Paper: An Intelligent Voice Enabled Web Portal for Visually Impaired Persons**

Author(s): Shahad Said Hamed Alwahaibi, Aya Salim Mubarak Alghaithi, Kumar Mohan

Affiliation: Shinas College of Technology

Abstract: *More than 20% of the world's population suffers from various types of disabilities, the most difficult of which is visual impairment. The number of people in the Sultanate of Oman is 21,200 visually impaired, approximately 19% of the population, according to the Ministry of Social Development, which announced in 2018, so it is difficult to go blind or deal with the environment and society without the help of others. But with the advent of artificial intelligence devices and applications, which is the ability of the machine to emulate the human mind, there has been a radical change in the lives of blind people in all aspects of their lives so that they can integrate into the lives of ordinary people, study, work and return to their destinations without anyone's help as we found through our study. At the Al Noor Association for the Blind in Oman, in Muscat, which showed that many of its blind members, were able to study, work and support families after having artificial intelligence. We will come out of this research on the importance of artificial intelligence in the lives of the blind and the need to use it because of its great impact in facilitating their lives in addition to the possibility of developing these devices and applications as desired by the blind.*

[14] **Title of Paper: Framework to prevent Carbon footprint in the campus and analysis of preventive measures to reduce the emission**

Author(s): Jamila Bakhit Marhoon Al Yaaqubi, Jitendra Pandey

Affiliation: Middle East College, Muscat

Abstract: *Artificial intelligence has become a focus of certain ethical concerns, but it also has some major sustainability issues. The Research focuses mainly on the carbon footprint of artificial intelligence technology that may affect the environment, either positively or negatively. As technology itself is considered aiding, conservative and developing the environment by following the suitable way because it helps to develop the state in most of its fields, as technology is manufactures products through machines also, it used artificial intelligence which is use it in most fields and perhaps all of them, so it makes easier for people to perform their activities with ease way. Consequently, scientific and technological independence is a necessary result and condition for achieving a true national lifestyle (Christen, 2004). This issue gets even more severe in the model deployment phase, where deep neural networks need to be deployed on diverse hardware platforms, each with different properties and computational resources.*

[15] **Title of Paper: Smart Home Security System Using Biometrics**

Author(s): Jinal Bakhai, Annie Eapen, Aishwarya Rao, Nidhishree Mendon

Affiliation: Waljat College of Applied Sciences

Abstract: *The field of science and technology has been advancing rapidly in a logical and pervasive manner. The current fast paced lifestyle has increased the dependency of people on technology for not only convenience but also to efficiently perform day to day activities. The Internet of Things has been widely accepted by various sectors; the most prominent of them all would be security and home automation. Home security is an evergreen need of the hour; it began as a mere key lock system and has been evolving constantly. The concept of home security can be considered from many perspectives but it comes down to 'who' is permitted access into the house. Thus, authentication evidently plays an important role. A smart method to facilitate authentication in an instantaneous and accurate manner is through biometrics. This paper focusses on IoT and Biometrics, their evolution and how they can be integrated in home security. A door lock system has been proposed to portray one of the many ways home security can be efficiently achieved. The primary aim of the project built using raspberry pi is to convert an ordinary door lock into a smart door lock using the concepts of IoT and Biometrics in a cost effective and sophisticated manner. It also aims to be hassle free and avoid the need to carry a physical access key or card that can be easily misplaced or stolen. This system allows the owner to be notified and to monitor the security of his or her house from anywhere, at any given time with the use of the internet. Face recognition using Open CV is used as the mode of identification in this project due to its quick method of detection, reduced manual effort and the benefit of no contact. Its accuracy can easily be enhanced by competently training the system with the required faces. In the case of an unrecognised visitor, the owner is notified with a picture of the visitor via email along with an OTP to be sent to the visitor to allow access if desired. The system also has a backup method of access which would be useful in the unlikely case of the recognition system being faulty- a 24 hour valid Pin. A detailed explanation of the system, how it was built, its additional features and possible future enhancements have all been depicted in this paper. In a world of such rapid advancements and technology dominating global markets, it is imperative to make sure that all sections of the society are able to stay up to date and experience these developments equally, especially if it holds the advantage of increasing one's security.*

[16] **Title of Paper: SHCT Symposium Management System**

Author(s): Laila Ali Mohammed al Balushi, Fatema Saif Marhoon Al Saidi, Maryam

Mohamed Juma Al-Shihi, Myra Patalay

Affiliation: Shinas College of Technology

Abstract: *Symposium management system is becoming much more common nowadays. Having a system to handle symposium details provide a good facility for communication and information dissemination. SHCT symposium management system can speed up the processes taking place in conducting a symposium at Shinas College of Technology, like submission of research work, reviewing the submitted researches, as well as moderating and paneling researches during presentation. Through the system it also save the different users' valuable time and efforts specifically the time spent on checking schedules, updates and status. It makes research life easier to manage.*

[17] **Title of Paper: Expert Finder through Data Mining, and Training Management for Collaborative Virtual Environment among Higher Educational Institutions: An Assessment of its Effectiveness**

Author(s): Sheikha Hassan AL-Zaabi, Kawther Mohammed AL-Amrani

Affiliation: Shinas College of Technology

Abstract: *Human resource is arguably the driving force for any organization in achieving its mission and strategic objectives. Effective and efficient use of this resource can spell out success or failure for an organization. With the modern technology that we have today that allows every organization to collect and analyze all forms of data effortlessly, still many organizations do not have computerized systems in place to track where their employees' skills are the strongest, their weakest point, and what they lack. This is also the scenario for most of the higher educational institutions (HEIs) in Oman where employees' knowledge and skills inventory is not maintained properly and efficiently. For this reason, the researchers were motivated to propose a study that will focus on the development and implementation of a web-based system that will be a useful tool to leverage the utilization of pool of professionals in HEIs and to equip the management in making better decisions with regard to human resources. The system will have the capability to find subject matter experts within the HEIs, by employing data mining techniques for efficient search performance, who can be tapped to perform needed tasks or who can serve as a resource speaker for in-house trainings to address skill gaps or to continually fine tune the skills of the staff. With this, sharing and collaboration of experts within and among the HEIs is made possible. The system will also have a feature to manage the training classes and registrations that will be conducted by any of the institutions. The goals of this undertaking are to: a. Gather a detailed set of system requirements specification; b. Set-out design and implementation approaches; and c. Conduct a pilot study at Shinas College of Technology by implementing the system to assess its effectiveness. In accomplishing the above goals, the researchers will use waterfall model in developing the application. The researchers will collect user requirements by employing various data gathering techniques from various users in the different HEIs. In the design phase, the researchers will use appropriate design models or tools. The system will be implemented in a multi-tier architecture. The developer platform that will be used is ASP.Net and MS SQL Server for the database. The system will be tested accordingly to verify and validate the different functionalities.*

[18] **Title of Paper: Framework of Voice and Gesture Based solution for Blind using AI and IoT**

Author(s): Maha Khalid Ali Al Badaai

Affiliation: Middle East College, Muscat

Abstract: *Many people are facing problems in their sight. It is not only blind people who the focus is on, but also those who have low sight problems. Starting with students, they face difficulties on reading or accessing the different resources that have been uploaded to them by their lecturer. Moreover, blind students are facing difficulties with the universities not taking into consideration blind students when building the university campuses. Therefore, you will see blind students having difficulties finding the right building or the right class. Blind people are not only students, but they can also be general people at different ages. For examples, it can be on others who would go for shopping with an assistant with them. This assistant is not always available, which can be a problem for the blind people who is connected to an assistant if he wants to go out. The Technology is now providing solutions for*

blind people, some of those solutions are physical and some of them are in from of a mobile device applications. Many literature shows that the physical devices such as the blind stick have limitations and only provide directions to the blind people to help the find their way out and to prevent them from hitting something they do not see such as stone thrown on the way or even a wall. These physical devices have sensors to warn the blind that there is something in front of them. Moreover, there are different technological solutions such as the mobile applications that are designed for blind users such as LookTel. These are more specific compared to the physical solutions because they gather most solutions in one device. These applications have helped the people who have vision problems a lot. The only problem is that some of the blind people might not have a smart phone. Even though it is hard to see someone without a smart phone now a day, but this is still an opportunity that can be faced by blind people and might prevent them from taking the advantage of such applications. This research will use the applications technology to make blind people easier than expected.

[19] **Title of Paper: Agrioasis: Online Farming Investment Platform**

Author(s): Zainab Matar Khadeem Aljabri, Hajer Khalfan Al Shamsi, Hajer Khalfan Al Fazari

Affiliation: Shinas College of Technology

Abstract: *Information Technology has changed the way we do business with other people. Online business platforms are launched here and there to help facilitate the exchange of goods and services in a cost-effective and hassle-free manner. These platforms make it possible for various stakeholders to interact with each other seamlessly beyond distance barriers. In this study, the researchers focus on the development and implementation of an online investment platform specifically intended for small-scale Omani farmers and private individuals in Oman who are looking for an opportunity for passive income, which is the first of its kind in Oman. This online platform serves as the focal point for farmers who do not have sufficient capital to fund their farming projects and private individuals who are interested in farming but do not own agricultural lands and are willing to take risks in investing. The farmers can easily post their farming projects which need funding while investors can choose which farming projects they can invest on at the comforts of their home. The researchers used the waterfall model in the development of the system. System requirements were captured using various data gathering techniques and were represented using Use Case Diagrams. The researchers designed user interface prototypes to visually represent the user requirements and the system workflow. The data design of the system is modelled through Entity Relationship Diagram. The online platform is designed with a multi-tier architecture. In the implementation, the researchers used PHP as the scripting language and MySQL for the database. Various testing strategies were performed to validate the required functionalities and to ensure the quality of the system. The researchers believe that this study is beneficial for small-scale Omani farmers as well as private individual who are into investing because of the fact that it serves as a bridge for these two entities to help one another in pursuing a business opportunity. Moreover, the researchers hope to contribute to Oman government in its initiatives to boost the agriculture sector for economic stability and sustainability especially now that revenues coming from the oil sector is decreasing year by year.*

[20] **Title of Paper: Towards a sustainable smart city: an IoT based prototype development for smart parking solutions**

Author(s): Samiya Said Ali Sulaiyam Al Badi

Affiliation: Middle East College, Muscat

Abstract: For many previous years the population has increased in cities around the world at high rapid rate. That cause looking of improvement in all facilities and services in many aspects of life. So, intelligent and innovative solutions are critical for increasing productivity, growing operational competences and decreasing management expenditures. Now most cities are transferring to smart facilities to ensure high performance, availability and flexibility. One of the major issues of the expansion is the traffic and finding free parking lots especially during rush hours. Modern technologies innovation makes many services easier to use and ubiquity. Internet of Things (IOT) can attach millions of devices any time with many applications depends on user's demands (Cynthia, Priya, and Gopinath 2018). One of the most substantial present research argument topics is about the smart car parking system. Because many studies reflect the effect of difficulties to find vacant parking space in cities. It estimated 30% of daily traffic is caused by vehicles in parking lots. In addition to wasting time in searching for free parking around 7.8 minutes (Mainetti et al. n.d.). The searching for parking is not only wasting of time and fuel but causes pollution, accidents and peoples obstruction. IOT make chances to improve and develop smart parking system to reduce all these issues.

[21] **Title of Paper: The effect of visual content with augmented reality to develop some visual culture skills for students with hearing and vision impairment (Case Study)**

Author(s): Amr Abdelazim Elsayed Ibrahim

Affiliation: USM-Barka

Abstract: The hearing and visual disability represent an impediment to the student if he does not find appropriate special care in all aspects of his social, psychological, and educational life. This is evident in the field of education for students with hearing - visual impairment. Moreover, the weakness of visual culture skills is one of the most important problems that students with hearing and vision impairment in their studying. Augmented reality technology offers a great advantage to make student learning more effective and attract their attention Thus enhancing several visual culture skills of them compared to traditional ways of presenting educational content. Therefore, this study aims to measure the effect of providing visual content by purifying augmented reality in developing some visual culture skills for Students with Hearing and Vision Impairment. The case study relied on a student with hearing and Vision impairment in the seventh grade at Al-Manara private School, in Barka in Sultanate of Oman, during the academic year 2018/2019. The study was conducted by designing and implementing an individual educational plan to providing an instructional content was presented through augmented reality technology. The results showed that there are statistically significant differences between the pre and post measurement in favour of the display technique by purifying the augmented reality and that it has contributed significantly to the development of some of the student's visual culture skills such as the skill of visual production and the skill of reading optics, It showed a positive attitude by the student towards it. This was measured through the experiment using the notecard, and the personal interview, to investigate the effectiveness of augmented reality technology and the student's attitudes toward it.

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- [22] **Title of Paper: Smart Book (IOT)**
Author(s): Maitha Rashed Mohammed Algaithi
Affiliation: College of Applied Science, Sohar

Abstract: *Nowadays, everyone wants to use smart technology to help people in our lifestyle and simplify our task. And the most use of technology is in education, the education sector is one of the popular sector that use smart technology on education to develop and provide various ways of learning and built educated community. At this project, we are designing Arabic smart device book which is especially for kids who are from 3 to 4 years old. All the contents are in Arabic language, and we choose educated content for pre-school children. This book will educate kids and will prepare them for studying at school when they grow. Smart book device has Arabic contents and it is especially a learning tool for kids. This smart book will effect on attracting kids for learning. They are many smart books and technologies for learning, but most of them are supporting English language. We believe our smart book will impact positively on human education, because the traditional ways are not that much efficient. It will simplify the educating and make it interesting and easy. The book has unique design which has different pages, and user need to use our designed cards to upload the new content of each page. Then, user need to fix the page at the surface of the book. Then, kid can use buttons and hear the sounds of that page. Currently we are implementing content for the following subjects: numbers, letters and words. We implement our smart book by using Arduino and recording our voice for the sounds of each content, and designing pages and cards by Photoshop. Smart book device is for children who are over than 18 years old. At this age children need to lean by using fun and exciting learning methodologies. This book is designed to attract children learns at. There will be a corporates between mother and children, because child will need some help in putting the cards and advise him how to use the smart book. Moreover, the book will help mother to get her child from using other games devices. On future, we are planning to import our smart book device to be used at schools to kids over than seven years. We are also planning to implement an online platform to manage kid's performance.*

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- [23] **Title of Paper: About Covid-19 (corona virus)**
Author(s): Mona Qasim
Affiliation: Oman medical college, Muscat

Abstract: *Coronaviruses is a common virus family known to cause a range of diseases ranging from mild respiratory infection to severe pneumonia. There is also another type of corona virus include MERS-Corona virus and SARS-Corona virus. SARS-CoV was identified in 2002 as the cause of severe acute respiratory syndrome (SARS). MERS-CoV was identified in 2012 as the cause of Middle East respiratory syndrome (MERS). SARS-CoV2 is a novel coronavirus identified as the cause of coronavirus disease 2019 (COVID-19) that began in Wuhan, China in late 2019 and spread worldwide. These coronaviruses that cause severe respiratory infections are zoonotic pathogens, which begin in infected animals and are transmitted from animals to people like SARS-CoV spread from infected civets to people, while MERS-CoV spreads from infected dromedary camels to people. While SAR-COV2 (covid-19) it is under study some scientists they said its spread from infected bat. That bat was injected by corona virus and was under studies in laboratory and then fly away and someone eat it and spread the disease. And some scientists said when scientists were doing researches and studies that lead to form corona virus which is a biological mistake. And by mistake leaked from laboratory. Until now the source of covid-19 is unknown. The target of corona virus is until now unknown and not clear, but due to the new England journal of medicine that coronavirus disease 2019 (Covid-19) interface with the RAAS through angiotensin-converting enzyme 2(ACE2), an enzyme that physiologically counters RAAS activation. The interaction between the SARS viruses and ACE2 has*

been proposed as a potential factor in their infectivity. After the initial engagement of SARS-CoV-2 spike protein, there is subsequent down-regulation of ACE2 abundance on cell surfaces. Continued viral infection and replication contribute to reduced membrane ACE2. Down-regulation of ACE2 activity in the lungs facilitates the initial neutrophil infiltration in response to bacterial endotoxin and may result in unopposed angiotensin II accumulation and local RAAS activation which mean dysregulation of ACE2 may mediate acute lung injury. That show also people who infected show their blood test that they have high blood level of cytokines, chemokines IL1- β , IL1RA, IL7, IL8, IL9, IL10, basic FGF2, GCSF, GMCSF, IFN γ , IP10, MCP1, MIP1 α , MIP1 β , PDGFB, TNF α , and VEGFA. However, nowadays (COVID-19) represents the causative agent of a potentially fatal disease that is of great global public health concern. Based on the large number of infected people and every day the number is increase and increase around the world. The first cases were reported in December 2019. From December 18, 2019 through December 29, 2019, five patients were hospitalized with acute respiratory distress syndrome and one of these patients died By January 2, 2020, admitted hospital patients had been identified as having laboratory-confirmed COVID-19 infection, less than half of these patients had underlying diseases, including diabetes, hypertension, and cardiovascular disease . These patients were presumed to be infected in that hospital, likely due to nosocomial infection. It was concluded that the COVID-19 is not a super-hot spreading virus (spread by one patient to many others), but rather likely spread due to many patients getting infected at various locations throughout the hospital through unknown mechanisms. In addition, only patients that got clinically sick were tested, thus there were likely many more patients that were presumably infected. To test for COVID-19, a health care provider uses a long swab to take a nasal sample. The sample is then sent to a lab for testing. If you are coughing up saliva (sputum), that may be sent for testing. You can protect yourself and help prevent spreading the virus to others if you: Do Wash your hands regularly for 20 seconds, with soap and water or alcohol-based hand rub. Cover your nose and mouth with a disposable tissue or flexed elbow when you cough or sneeze. Avoid close contact (1 meter or 3 feet) with people who are unwell. Stay home and self-isolate from others in the household if you feel unwell. Do not Touch your eyes, nose, or mouth if your hands are not clean.

[24] **Title of Paper: Self- checkout smart cards for Smart Shopping**

Author(s): Maroa Abdullah Said Al Zidi, Shahed Yaqoob Juma Al Raisi, Jitendra Pandey

Affiliation: Middle East College, Muscat

Abstract: *Smart cities are built-up area that implement different types of electronic Internet of things (IoT) sensors to collect the data. The data that the sensors are collecting are used to manage assets resources and services efficiently. Those cities are digitally transferring to improve the financial, environmental, and social aspect of urban life. (M. Saraju P., etc. 2016) The traditional consumer of buying is continuing to evolve, that what makes the merchants thinks about their sales opportunities. Lots of people are searching for the fast and easies way to collect the products that they need. (H. Blanca., etc. (2010). The main objective of this project is to implement a smart shopping cart with the help of RFID technology to optimize the purchase. Is to use the RFID-related implementation practice in the cart. In this project, the RFID card is used as a protection entry to get the goods in the mall. If the item is placed in the shopping cart, the price of the product will appear, and therefore the total amount will be displayed. If we want to remove the product from the cart, you can withdraw the product and get the amount of this specific product deducted from the total amount, thus enhancing security performance and speed during purchase in shopping complexes. The key point of the proposed framework is to give innovation that is geared to a minimum of effort, adaptable effectively, and efficiently to assist shopping individually. So much time is saved on billing counters. (Megana 2018). This paper presented*

smart shopping cart that is implemented of Internet of things (IoT). This technology is drive IoT research in the future. The smart shopping trolley is implemented by using RFID card. The trolley is full of sensors and it giving the customers there needs.

- [25] **Title of Paper: Smart Technologies to improve Student Engagement in Campus**
Author(s): Zahra Al Harthy, Ahmed Al Muqaddam, Vikas Rao Naidu
Affiliation: Middle East College, Muscat

Abstract: *Smart cities are rapidly developing in every part of the world. Almost every education institution has their own well-established IT infrastructure to support student learning experience, in higher education sector. Usage of smart devices are becoming very common during the classes and now the concept of Bring-Your-Own-Devices (BYOD) has given a different shape to the teaching and learning process. Besides this, many tasks are being automated by means of these smart devices. Earlier smart devices were used only in the classroom teaching, but now a days some of the educational institutions have started using smart devices for their other activities, which involves, registration process, examination process, extracurricular and co-curricular activities. This research paper proposes two ideas of usage of smart devices for non-teaching purpose in the campus which can be very beneficial to speed up of some processes like, e-hall ticket scan for the invigilators and automatic point system calculation for students' participation in extracurricular activities. Keeping various HCI aspects for user interface design, the paper also recommends a framework for the design process of this system.*

- [26] **Title of Paper: Importance of Smart Applications highlighting Natural Reserves and Unexplored Destinations to Promote Oman Tourism – Post COVID19 Strategies**
Author(s): Sara Al Tuwaiya, Uroosa Fatima, Vikas rao Naidu
Affiliation: Middle East College, Muscat

Abstract: *Tourism is one of the important sources of revenues for any Country. Some countries around the World have very attractive tourist destinations and every year attracts millions of tourists. However due to the prevailing situations of COVID-19, travel and tourism industries are facing a big amount of loss which was totally unpredictable. Nobody has exact predictions of these losses in upcoming days. Now it's a challenging situation for each country to think of design of some innovative strategies to re-start their tourism once the situation comes to normal. Although smart technologies could support to a great extent by means of providing a very good promotion, still the concern authorities need to think of other innovative approaches. This research paper discusses proposal of an of such innovative approach, which could be adopted post COVID-19 situation. There are several natural reserves in Oman which are still unknown to many residents and tourists. Moreover, there are many unexplored destinations of Oman which needs to be brought to the limelight. Based on analysis of survey and interviews, this research paper suggests a framework to develop a mobile application for this purpose. Various technologies such as Virtual Reality and Augmented Reality are discussed in this paper along with their roles in the new strategy design. The data is collected from the people in Oman using online surveys and online interviews. The research paper will also consider various usability aspects of user interface design.*

- [27] **Title of Paper: Role of Augmented Reality based E-Learning Application in Enhancing**
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Teaching and Learning Experience in Education Sectors**Author(s): Mahmood Al Raisi, Hanin Mohammed Abdulsalam, Vikas rao Naidu****Affiliation: Middle East College, Muscat**

Abstract: *Augmented reality is an emerging technology in the field of interactive multimedia. It is being widely used in gaming industries apart from entertainment purposes. Some of the commercial product visualizations are planned in augmented reality-based platforms in order to provide exact look and feel of the final product to the customers. Education sector has started using Augmented reality based in some areas. Where practical components of lab are becoming challenging to teach, Augmented Reality based applications are playing a vital role in teaching those parts. For example, in Civil and Mechanical engineering, if the labs do not have any heavy machine, they can teach it with the help of Augmented reality-based models. The experience of augmented reality-based learning is so immersive that the students can get a 360-degree view of the actual hardware products without even stepping into the challenging situations. This research paper studies and analyses the requirement of augmented reality-based applications that are being used in the education sectors to enhance teaching and learning experience of the community of learners. As a part of the final recommendations and conclusion, this paper would provide a framework to implement augmented reality-based teaching methods in education field.*

[28] Title of Paper: Smart Health System for Elderly house residents**Author(s): Malak Rashid Mohammed Al Rawahi****Affiliation: Middle East College, Muscat**

Abstract: *Several health problems can happen to residents in elderly houses which can lead in some cases to death if it is not detected urgently. In order to help the medical team in elderly houses to monitor the health of residents and intervene immediately in case of any health problem, we are planning to design a smart system based on Internet of things that will monitor the most common factors of health problems using a smart watch which will sense the body and identify the health problems that will occur in the patient's body. If a health problem occurs, the smart watch will send a signal to the administrators. This signal shows patient data as well as health diagnosis. To this end, I shared a questionnaire with the health team in elderly houses asking about the common health problems and their related detection factors. In addition, I conducted interviews for staff working in a nursing home. Moreover, a literature review on smart health systems has been studied. The results demonstrated the importance of monitoring the most common diseases faced by aged people such as diabetes, high and low blood pressure, high body temperature, and low heartbeat. Sensors such as glucose monitoring, Ingestible sensor, coagulation testing and heart beat are the most important sensors in the field of health care.*

[29] Title of Paper: Analysing the Importance and Impact of IT Skills during COVID -19**Author(s): Ahmed Abdellatif Abdelhamid****Affiliation: National University, Muscat**

Abstract: *COVID-19 has brought the world to a standstill and everyone is experiencing the virtual world, to different degrees, and students are no exception. Learning has changed a lot in the present pandemic time. The most essential equipment in today's day and time is the laptop. It is the most important machine used for connection and communication. IT skills which had limited and restricted use have overnight become the most important skill to be learned and trained at. Everyone's IT skills were tested and challenged. Students had no choice but to upgrade their skills. Typing replaced writing. This meant handling the keyboard and all the shortcuts. What was limited to cut, copy, paste*

had broadened to upload, download of videos and adjusting to online assessments. The whole experience is surreal. Also, to keep up with the change in the teaching and learning process, various applications were used. The aim of the paper will be to examine how the laptop was used? Which other devices were used? How was it different to do these in a mobile phone? Also, it will study how students improved their IT skills, for example, typing skills, reading on the screen, making the videos and uploading them? Followed by how they self-taught and adjusted to Zoom, Google classroom and others. Besides this, to what extent social platforms were used for education. All these changes will leave a permanent impact on how, in future, teaching and learning will be delivered and perceived.

[30] **Title of Paper: Human Computer Interaction Considerations in Design of Mobile Application for National Statistics and Information (NCSI, Oman) for Educational purpose**

Author(s): Miad Al Amri, Vikas rao Naidu, Suad Al Qassabi

Affiliation: Middle East College, Muscat

Abstract: During this era of smart technology, almost every organization is well connected with their respective stakeholders by means of smart platforms. Almost every public and private establishment has their own websites or portal to interact with their stakeholders, which includes their employees as well as customers. But for the past 6-7 years we have noticed increase in the number of mobile applications for various services being provided by these organizations. Some of these applications are meant for just passing on the regular updates and information. E.g. News application. Whereas some of the mobile applications are also interactive in nature. The interactivity design of any mobile application should follow some guidelines when it comes to the user interface. Jacob Neilson's Usability heuristics are very famous in order to evaluate the user interface in terms of usability. National Centre for Statistics and Information (NCSI) is one of the important government organizations in Oman which is responsible for many data related to the population of Oman. Census is just one of those. At present, some of the schools are taking tremendous interest in introducing various services of NCSI to the students, so that from the school level itself, they could learn various statistics related to the country. Hence this paper presents a requirement for designing a mobile application for this purpose, considering the user interface as it is meant for young users. This research paper studies various HCI aspects of user interface of such application design and provide recommendations since the proposed application is meant for the school children.

[31] **Title of Paper: Impact Of Higher Education On Economic Growth Of Oman**

Author(s): Shifaa Nasser Salim Al-Hinai, Raya Nasser Abdullah Al-Mawaali, Gnana Rajesh.D.

Affiliation: Al Musanna College of Technology

Abstract: Education is the major and an important part of our life it's the power to get knowledge and skills. Education can improve the life style of people as well as it improves our society and expand to improve the economy of the country. Higher education is become an important part of our life. Each person that have certificate is as an important one in our society for that each organization in every city try to provide all skills, requirement and enough experience for their student. In this research we highlight in higher education topic and how it affects our life and what is the impact of it in Oman's economy. The aim of conduct this research is to show for the world how is higher education be necessity in our life and what is the relation between the higher education and economy. The objectives of conducting this research are gathering more information about the relation between the higher education and economy in Oman, showing the impact of higher education in people life style, society and country, the necessity of higher education and prove that higher education can improve the

infrastructure of any country. In this research, we first search about some existing research papers that have same topic to see the methodology that used in it and how they conducted their research. After that we collect the data for our research by conducting electronic questionnaire for students of Al-Musanna College of Technology and some of our friends. In addition, we analysed the results of each question in the questionnaire and from this quantitative research we found many results from the questionnaire which are many people are agree that higher education is the reasons to improve their live style and increase their salary moreover they have such knowledge about that higher education can improve our economy by have many students have experience in many specializations. At the end of our research, we understood that growing the economy of the country is related essentially by the citizen's level of education, if the citizens have high level of education, they will have better life, salary, life style and thinking which will reflects on the development of country's economy. In addition, our research encouraged students to complete their education to the highest level possible. In future, our research can be developed by expanding the area of searching like comparing the economy of Oman with the developed countries that have high level of education as well as comparing with the poor countries that do not have high education to see the relationship between the lack of higher education and the economy growing.

[32] **Title of Paper: A Study of Digital Transformations in banking sectors for School Students in the Sultanate of Oman**

Author(s): Zahra Al Harthy, Vikas Rao Naidu

Affiliation: Middle East College, Muscat

Abstract: *Digital technology has profoundly altered nearly every aspect of our lives. Incredible advances in computing, the growth of artificial intelligence and the emergence of big data are transforming all facets of life and work in leaps and bounds. As a result, the skills that are required to enter go beyond what is traditionally taught in schools. Sultanate of Oman is one such country which is continuously working towards the adaption of latest trends and technologies in almost every sector in order to boost the economy of the country and provide various opportunities to its residents. Banking sectors are playing a vital role by working on various strategies so that the residents/account holders could invest for future usage and long-term plans. As a part of this, one of the leading banks has introduced a program called 'Little investor'. Little Investor program was conducted for elementary and preparatory school students. They were introduced to business and economics with a focus on mathematics, reading and writing skills. The module was aligned with their school curriculum and it encouraged students to apply creative thinking and social skills to learn financial management. Students were engaged in the number of interactive and informative sessions using group-based activities and a specific set of materials designed specifically for this program. The program motivated students to have ambitions related to their career and created awareness on the relevance of this knowledge in their real world and the value of their contribution to the local and national economy. This research paper studies and analyses the requirement of digital transformations with advanced technologies for school students in Oman. Finally, the authors will provide their findings, recommendation and conclusions, in order to justify if this program at this level would be helpful for the children at the school level or not.*

[33] Title of Paper: Survey to Network Administrators**Author(s): Hafsa Abdullah Ali Al Sinani****Affiliation: Middle East College, Muscat**

Abstract: *Today's Campus networks have an increasing demand on providing fast and easy access to the WIFI, lab and library in order to provide a suitable learning environment for the students. This may impact negatively on the security of the network by exposing the network to different kinds of attacks such as physical intrusions and unauthorized access to the network. In order to overcome these security challenges, we decided to design and implement a smart network monitoring system for a higher institution. The current research is based mainly on a review of the relevant literature in this field and also on distributing a survey to network administrators in order to study the most important features and characteristics of the intended system. The results demonstrate a strong need to control the physical access to labs and other open resources in an implicit way. This requires the use of usb cameras and artificial intelligence capabilities in order to analyze the behavior of suspect intrusions and send notifications to the administrator. There is also a need to monitor the physical access to switch ports and Data Link layer errors and data amount in order to maintain the good performance of the network and to identify any abusing use of the resources. In the light of these results, we decided to design and develop a project covering the most important identified features based on IoT and RMON services.*

[34] Title of Paper: Student- Self- Centered Development Powered by Direct Remote Learning (DRL)**Author(s): Ibitisam Abdullah Al Moqbali****Affiliation: Sohar University**

Abstract: *Student representatives play a key role in improving the education system. This presentation intends to discuss how during the Directed Remote Learning phase in one of the private universities, the leadership skills of the representatives got enhanced. Once the Coronavirus gripped the entire globe, the educational institutions in Oman hastily turned to online learning in order to offer the students flexible learning opportunities while staying safe at home. However, this huge jump from the face to face teaching and learning mode to online platforms posed numerous challenges to all. Instructors had to design the teaching and learning materials in such a way that their physical absences are not felt. The learners too had to shake off their take-it-for-granted attitude and be fully attentive and cooperative. One way to bring the teachers and the students together was to involve the student representatives. In addition to the main platforms which are the Moodle and the MS Team, WhatsApp groups were created for (1) all courses, (2) for section leaders and (3) for the instructors and the student representatives. This structure helped the students and the instructors to interact in a very constructive manner. Through constant interactions with the instructors, the presenter, as a student representative, learned much more about material designing, assessment strategies and teaching approaches than she would have in normal circumstances. The presenter would therefore, like to share in detail how her DRL experience has empowered her and the other student representatives with professional skills that would help them succeed in their future workplaces.*

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- [35] **Title of Paper: Computer aided tool for Early Detection of Alzheimer's Disease**
Author(s): Salima Sulaiman Said Alhinai, Marfa azhari Ahmed, Alaa Ali Alsheikheh
Affiliation: Middle East College, Muscat

Abstract: *Multidisciplinary approach in research is of paramount importance that can offer sufficient and relevant solutions to issues including healthcare problems. Over the recent years, medical imaging research has increased to its zenith that employs principles of engineering utilizing Artificial Intelligence techniques and image computing techniques to medical modalities to yield efficient healthcare solutions. Alzheimer's disease (AD) is a devastating condition that leads to significant memory loss due to neurodegeneration. An early identification of such conditions is significant to reduce the disease progression which subsequently improves the life of patients. MRI scan has been the best modality to visually diagnose the brain tissue state. In fact, visual inspection by the radiologists has its limitations to accurately detect the amount of cell death happened. Moreover such a volumetric analysis is of great importance to identify the progression rate of neurodegeneration of brain tissues over a period of time. Hence an automated system that provides a volume of neuronal death of individual brain tissues from MRI scan images helps to reduce time and effort of radiologists to diagnose the disease progression. This research aims to develop such a system to accurately measure the pixel volume of brain tissues. Methodology includes the image pre-processing steps followed by segmentation of brain tissues into Gray matter, White matter and Cerebrospinal fluid. Medical informatics has been found to be very successful in finding solutions of scientific problems through which advanced computational techniques are utilized to decipher the language of medicine.*

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- [36] **Title of Paper: Study of proton exchange membrane fuel cells**
Author(s): Chaudhry Taimoor Niaz
Affiliation: German University of Technology, Muscat

Abstract: *Nowadays internal combustion engines (ICE) is something which we need to drive forward in life, and it is the very thing which runs airplanes, gas-turbine engines, rocket-propulsion systems and most importantly our cars. However, we face many problems due to its normal usage such as consumption of large amount of energy which leads to pollution. Fossil fuels as a whole are used in most industries let alone in automobiles. These fuels such as petroleum and carbon-containing coal are harmful towards the environment, contributing to a consequence known as global warming which is slowly causing permanent alterations to our planet (Dharmalingam, Kugarajah, & Sugumar, 2019). In order to confront these ascending matters, technologies are being utilized to produce energy from renewable energy sources such as solar, wind, hydro, and geothermal. However, one of the most prevalent and efficient ways of producing clean energy is by using a Fuel Cell, which offers numerous advantages over other renewable technologies (Dharmalingam, Kugarajah, & Sugumar, 2019).*

Typically, fuel cells are made up of a cathode, an anode, and an electrolyte layer. The cells endure oxidation-reduction chemical reactions which generates a stream of electrons, flowing from the fuel (anode) to the Oxidant (cathode) through an external circuit to produce electrical energy. Most fuel cells require Hydrogen only to produce an electrical output which can be used as desired (Matthey, 2020). Proton exchange membrane (PEM) fuel cells, also known as polymer electrolyte membrane fuel cells, involve a water-based, acidic polymer membrane electrolyte along with platinum electrodes. PEM fuel cells can function normally below a temperature of 100 °C and generate enough power for the needed application. Pure hydrogen is needed for operation due to the low temperature and the

precious metal-based electrodes (Matthey, 2020). PEMFCs are given more attention when compared to other fuel cells due to them being able to support various applications on a broader scale, offering a higher volumetric power density, and being able to operate at lower temperatures. Due to these reasons, 90% of the research and development in the scientific community is devoted to PEMFCs rather than its competitors. This has resulted PEMFCs being widely used in automotive in this modern era. This thesis project deals with the basic working principles of fuel cells, and progresses towards the manufacturing and working aspects of the PEMFCs. Furthermore, safety precautions regarding typical hydrogen fuel cell systems are also discussed. The main application of this thesis was to be at the event of Shell Eco-Marathon Asia 2020, where a prototype vehicle is to be manufactured by teams to achieve the best fuel economy. The team at GUTech also took part in this event (cancelled due to COVID-19), and a commercial PEMFC stack called H-1000XP by Horizon Fuel Cell Technologies was being used as the engine of the vehicle. The report also discusses all the working principles of the H-1000XP, along with its components and their function.

[37] **Title of Paper: Poisonous Gas Detection and Alert System in Oil Field using IOT**
Author(s): Haitham Ali Al-Yaqoubi, Mohammad Zahir Al-Lamki, Duhai Khalifa Al Shukaili
Affiliation: Ibri College of Technology

Abstract: *Poisonous gases leakage accidents are considered the major type of risks that is facing the petroleum extraction companies since natural gases rising is part of the process. Poisonous gases accidents led to an actual dangerous environmental and health risks like: the death of the staff or the perforation of the atmosphere layers. Hydrogen Sulfide H₂S could be the most harmful hazard gas in the industry. It has both long and short effect in human health. Fatigue, headache, dizziness, nausea, irritation to the eyes and nose and loss of consciousness are some of its syndrome. In addition to that, methane CH₄ is flammable gas that react with a low rate of heat which can create huge fires in the working fields. Also CO₂ Carbon dioxide which is a main reason of perforation of the atmosphere layers. When the extraction companies start to face this kind of hazard gases they put standard rules and methods to avoid the impact of this gases. Many gas detection systems and tools has been used in most of the extraction companies. Most of the companies are using separate devices to detect the hazard gases and manual methods to alarm the staff, but by the rise of technology and the 4th industrial revolution and IoT, companies started to build systems that can detect more than one hazard gas at the same time and automatically alarm the staff in the working field. Our project idea is based on similar concept with added features through the use of Arduino MKR 1000 which can be connected to the Internet, Gas sensor, Methane sensor, CO₂ sensor, H₂S sensor and Air Quality Sensor. After fixing these sensors in different locations in the RIG (working Location). It must send it readings to the MKR 1000 after that it will send it the web server. If one if the sensor reading was more than the normal rate/level the system will send a verbal alert to the staff in the field and to the server. All the alerts will be recorded in the server for future processing. The main idea in the project is not to detect these gases only but configuring the Arduino remotely without touching it directly.*

[38] **Title of Paper: Technology-Led Car Park Management System - The Case of Ibri College of Technology**

Author(s): Mohammad Al-Lamki, Someshvar K. Vashisht, Qais Qassim

Affiliation: Ibri College of Technology

Abstract: *The car parking management system is one of the notable applications of smart-city. It helps the beneficiaries of the system to find the available parking spots quickly and effortlessly besides providing necessary guidelines to ease the parking, reducing frustration and saves time. The project has been designed and implemented to cater staff members of Ibri College of Technologies in finding the available parking slots more conveniently and timely. One of the difficulties confronted our staff members is finding the available parking lots within the eight existing parking areas which are located in different locations across the campus. Therefore, an efficient, reliable and convenient car park management system is required.*

[39] **Title of Paper: Fish Farming in Oman Using IoT**

Author(s): Abdul Aziz Al-Rasbi, Ibrahim Mohammed Al-Harhi, Aahid Al-Harhi

Mohammed Al-Saadi, Mr. Mohammed Tauqeer

Affiliation: Ibra College of Technology

Abstract: *Fishes in oman like many alive creatures have precise tolerant range of various ecological bounds, thus fish agri-business of specific types of fish types requires certain conditions that have to be reached. Moreover, the people that work in the fish agri-business in oman have to be engaged in all day activities to maintain the living fish environment. Therefore, monitoring and taking actions to maintain the environment's sustainable atmosphere for certain fish species inside of fishing area over distributed machine to machine communication, which will shorten the time needed for some basic actions, is the main motivation for this paper. In this paper we present an improvement on a functional Internet of Things (IoT) system for monitoring fish farming in seas. The IoT system consists of various sensors that measure important factors of the water quality like temperature, light intensity or water level, as well as small board computer that processes the data and sends sound and visual notifications to the fish farming manager. The current system lacks the ability to process the data to the end-user via web or mobile platform. Due to remote distance of the fish farming ponds and their location dependence of clean fresh water, one solution of this problem is using expansion module like Wivivity modem to enable the end users in real time to monitor and control certain aspects of the fish agri-business area IoT system. Wivivity modem allows user to communicate to the IoT system via WiFi connection, cellular, LoRaWAN or satellite communication; all in one product. Later on, this module can be integrated with IoT platforms including ThingSpeak, Ubidot, Microsoft Azure or Amazon Web Services.*

[40] **Title of Paper: IoT based Live pollution and temperature monitoring system for smart cities**

Author(s): Jawahar Khamis Obaid Al Sheidi, Khadija Musabah Mohammed, Abdallah Al Saaidi

Affiliation: Shinas College of Technology

Abstract: *One of the most disturbing concerns in big cities is the air quality level, where air pollution has caused extra deaths a year in Europe and 8.8 million worldwide [1]. Air pollution causes more extra death a year than tobacco smoking even though smoking is avoidable but air pollution is not. The World Health Organization emphasized that 97% of cities in low- and middle- income countries with more than 100 000 inhabitants do not meet World Health Organization (WHO) air quality guidelines. Because of poor air quality, potential increases in health risks such as possibility of stroke, heart disease [2], lung cancer, asthma and others as well [2], indispensably need to install an air quality monitoring system in major big cities to ensure the air is not contaminated in consequences of air pollution temperature will also raise our proposed system will also monitor the temperature and humidity level continuously and this information can be shared with authority and decision makers as well as to the public through smartphones, it will bring awareness, where the smartphone app allows people to monitor real-time data of the current air quality level in the area. Hence, through these implementations, better quality of life can be achieved.*

[41] **Title of Paper: IoT Based Remote Monitoring of Environment Related Parameters in Smart Home Patient Health Care Domain**

Author(s): Hajar Said Ali Al Maamaari

Affiliation: Shinas College of Technology

Abstract: *This Paper provides the solution to monitor and regulate the environment parameters like room temperature, air quality, toxic waste and ambient noise level of the patient's home with the help of a software Bot from both local and remote location. Nowadays the number of home patients after their major treatment required to stay at home for further observation, among various parameters for the observation, monitoring and regulating the environment parameters plays a vital role. With the support of IoT technology this paper aims to provide the solution by extracting various environment parameters with the help of relevant sensors and provided as input to the machine learning algorithm to decide whether the environment is suitable or it needs to be regulated. To automate all the process and to avoid anybody to enter the patient environment, a software Bot is designed to monitor and regulate the environment parameters. Patient home and software Bot will be connected to cloud and communication between patient's home and Software Bot will be enabled with the help of relevant APIs, so that monitoring and regulation can also be done from remote location.*

[42] **Title of Paper: Tracking Sysem**

Author(s): Sheikha Khalifa Ali Al Quyudhi

Affiliation: Ibri College of Technology

Abstract: *A tracking system is an electronic device installed in a vehicle or anything to enable the owner or a third party to track the vehicle's location. This project proposed to design a vehicle tracking system that works using GPS and GSM technology, which would be the cheapest source of vehicle tracking and it would work as anti-theft system. It is an embedded system which is used for tracking and positioning of any vehicle by using Global Positioning System (GPS)and Global system*

for mobile communication (GSM). This design will continuously monitor a moving Vehicle and report the status of the Vehicle on demand. For doing so an arduino microcontroller is interfaced serially to a GSM Modem and GPS Receiver. A GSM modem is used to send the position (Latitude and Longitude) of the vehicle from a remote place. The GPS modem will continuously give the data i.e. the latitude and longitude indicating the position of the vehicle. The same data is sent to the mobile at the other end from where the position of the vehicle is demanded. When the request by user is sent to the number at the GSM modem, the system automatically sends a return reply to that mobile indicating the position of the vehicle in terms of latitude and longitude in real time. This tracking system useful for track our cars or personal things to save it from thieves and is going to save our time while searching in other places it's very easy to use just by send SMS to the tracking system and then will get the location in the APP directly.

[43] **Title of Paper: IoT Clever Security System for Community**

Author(s): Amira Abdullah Nasser Aljaafariya, Sumaiyh Mohammed Bani Oraba

Ramesh Palanisamy

Affiliation: Ibra College of Technology

Abstract: *Today in the current global scenario, the prime question in every girl's mind, considering the ever-rising increase of issues on people harassment in the recent past is mostly about her safety and security. This paper suggests a new perspective to use technology for people's safety. We propose an idea, which changes the way everyone thinks about people's safety. A day when media broadcasts more of people's achievements rather than harassment, it's a feat achieved! Since we (humans) can't respond aptly in critical situations, the need for a device that automatically senses and rescues the victim is the venture of our idea in this paper. We propose to have a device, which is the integration of multiple devices, hardware comprises of a wearable "Smart band" which continuously communicates with a Some component like GPS and GSM that has access to the internet. The application is programmed and loaded with all the required data, which includes Human behavior and reactions to different situations like anger, fear, and anxiety. With the help of all electronics devices store the information to the controller which can operate the system automatically with intelligence. Also, it has fingerprint each finger have function such as, pinky is used for sea problems, Ring finger used for healthy problems, Middle finger used for missing persons, Index finger used for accident and Thumb used for burning.*

[44] **Title of Paper: Evaluation of the Perception, Attitude and Readiness of Healthcare Providers and Medical Students in Oman Toward the implementation of Artificial Intelligence in Healthcare**

Author(s): Saleh Al Maskari

Affiliation: Sultan Qaboos University, Muscat

Abstract: *Artificial intelligence (AI) is "the ability of computer systems to perform tasks that would usually require human levels of intelligence". AI has recently experienced an exponential growth across many industries including healthcare industry. It basically, includes the use of sophisticated algorithms such as machine learning, representation learning, deep learning, and natural language processing to mine for patterns and association in the fast growing clinical data. Regardless of the technique used, the general aim of AI in medicine is to use computer algorithms to uncover relevant information from data and to assist clinical decision-making. Despite all of the advances and application of AI in other businesses, its implementation in the healthcare is in its infancy. This is*

attributed to many factors such as privacy and confidentiality issues raised with sharing data, sensitivity of healthcare information and data storage infrastructure in health institutes. There are differing perspectives on AI, a pessimistic view that AI will replace humans and an optimistic view that it will augment human work so they can direct their time toward more cognitive skills.

[45] **Title of Paper: Research writing Challenges Encountered By Undergraduate Students**

Author(s): Reem Salim Alkindi, Taif Anwar Albusaidi

Affiliation: Mazoon College, Muscat

Abstract: *Research is a compulsory component of success for knowledge development. This study attempts to determine and analyze the challenges faced undergraduate students in conducting researches and find a solution to overcome these problems. This has been motivated by the realization that several undergraduate students experience difficulty while conducting research. Mixed research methodology is applied in this study. Questionnaires and interviews will be conducted with participant which will be selected randomly.*

[46] **Title of Paper: Autism And Advanced Technology: Use Advanced Technology Brings A Major Change Into The Lives Of Children With Autism**

Author(s): Amira Mohsin AL-Hamdan, Sara Mohammed AL-Hatmi, Gnana Rajesh.D.

Affiliation: Al Musanna College of Technology

Abstract: *Autism is known as weakness in the process of social interaction, as is the weakness in non-verbal and verbal communication with restricted and repeated behaviors and patterns, and this is due to the disorder of neuro development. It has many reasons, including genetic and environmental ones. It is not easy to educate children with autism spectrum disorder due to important behavioral problems and lack of education. In addition, traditional teaching methods may not be effective for children with autism. Therefore, it should be noted that the technology that should be used when teaching children with autism spectrum disorder must be proven and applied technology. Nowadays, some schools that provide special education services focus on providing the latest technologies to help autistic learners. As it is difficult to deal with children with autism, the traditional methods of their education may not be useful, through this research, we will be able to help some private schools for autistic children by drawing their attention to some technology that will help them in developing the basic and necessary skills for children with autism that will change their lives for the better. The purpose of this study was to find out of technology used for autistic children around the world so the schools in Oman can use this technology that we collected to improve skills for children with autism. The data was collected by searching for more literature review related to our study and extracting the technology that was applied to the education of children with autism. The use of information communication technologies among the autism children, use of I-Pads in the education, enhancing learning with the use of assistive technology Kinect-based educational games to benefit motor skills are identified and compared. This survey based research identifies the latest technologies around the world which can benefit the autism children. The results of the comparative study revealed that most of the children who applied this technology have improved their basic skills and are able to express their feelings and speak with others and participate with them in various activities A thematic analysis revealed three themes: technology, advantages of these technology, results for use these technology to educate autism children.*

[47] **Title of Paper: Evaluation of Vehicle Insurance Policies Based on Customer Feedback**

Author(s): Wafa Abdallah Mohammed Al-Breiki, Johina Salim Mohammed Al-Shizawi

Maryam Khamis Mohammed Al-Mamari

Affiliation: Shinas College of Technology

Abstract: *A JWM insurance company wants to start a system which can provide a good and clear idea about the policies to the customer and then carry out a survey of policies favored by the largest number of customers, and then provide it in the company. Here Promotion means advertising of the products through channels like Tele marketing, letters, signboards, TV Commercials, etc. The existing insurance companies provides various advertisement and policy introduction through different modes, but all the systems are end up with the communication lagging with the customers or the public. To attract more customers to the various insurance policies for their vehicles, there is a need of good introductory session and a well-managed event conducting is necessary. The purpose of the proposed system is to know the needs of customers and providing the policies that they need to ensure the success of the organization. To Provide best policies to customer, Customer feedback data will be analyzing using BI Tool.*

[48] **Title of Paper: An Exploratory Data Analysis of the COVID-19 pandemic in Sultanate of Oman and the World**

Author(s): Aviral Goel, Niranjanaa Mohanbabu

Affiliation: Waljat College of Applied Sciences

Abstract: *The Coronavirus disease (COVID-19) caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) was first identified in Wuhan, China in late 2019. The spread of COVID-19 to over 188 countries has created major disruption to the global economy and proved to be the greatest health crisis in the world. The severity of this pandemic has accentuated the need of applying data science to epidemiological studies and datasets available to understand the evolution of the virus, the virus-host interaction, predict its infection rate, and the approximate time when the epidemic will reach its peak thereby making better public policy decisions affecting millions of lives globally. The aim of this study is to perform an exploratory data analysis including visualizations, graphical representations and comparisons on the number of reported cases (confirmed, deaths, and recovered) of the novel coronavirus with respect to geographic location (city, province, and country). The COVID-19 data used in the paper is obtained from verified government organizations and international agency namely the Johns Hopkins University, World Health Organization (WHO) and Ministry of Health (MOH), Sultanate of Oman. The paper highlights the rate of infection and mortality in different countries (including Sultanate of Oman), the worst and least hit parts of the world, how government-enforced public lockdowns affected the spread of the virus, the impact of the virus on the economies and discusses the factors that accelerated or decelerated the spread of the virus. The importance of early data analysis on future epidemiological situations to curb the outbreaks is made evident and several machine learning algorithms are suggested to model the spread of coronavirus as future works.*

[49] **Title of Paper: The IoT And Personal Data Protection**

Author(s): Rajaa Said Saif AL Salhi, Jawaher Hamood Abdullah AL Maqbali, Gnana Rajesh.D.

Affiliation: Al Musanna College of Technology

Abstract: *IoT is a term coming new now a day. It is a new generation of internet that enables connecting and understanding between interconnected devices and let people control devices with no*

need to become in a certain place with certain device. While security means taking measures and procedures to protect something against any harm from external power. Exactly, it means safety or freedom. On the other hands, there is a personal data, which is very important in both IoT and security. It refers to something secret and unique and most people look for it like a key for hackers to reach them. It is the information that you can use it to identify about certain person or their whereabouts. It contains name, phone number, address, fingerprint, date of birth and credit card number. This paper aim to identify the extent of protection that personal data in IoT devices need it as well as enables cyber security in these devices. As the general problem, facing the Internet of Things devices is security and the protection of the user. We seek to find the importance of the need to protect personal data, we will go in our research to collect and then analyze many of the available data and conduct interviews with specialists in the field to take the public opinion to put personal data during its connection and linking to Internet of things devices. As we know, there are many technical scientific methods in the field of data protection and in this research, we will look at the best way to protect and preserve personal data during its connection to Internet of Things devices. We will define the trend to block chain technology for the strongest protection and encryption of data. At the end of the research, we must have an integrated search that contains a comprehensive explanation of the Internet of Things. Moreover, personal data that are relate to the extent and the extent to which they must be protected from any danger or threats that could cause the user's dissatisfaction or a decrease in the use of Internet of Things devices and from the best endeavor to The Internet of Things Development.

[50] **Title of Paper: School kid's safety information**

**Author(s): Shima Obaid Mohammed Al Farsi, Iman Mattar Khalfan al Washahi,
Noof Ali Ahmed Al-Saadi**

Affiliation: Shinas College of Technology

Abstract: *We are living in a fast and busy world. Most of the people are always running short of time. In this situation the parents have no time to pick and the drop the kids in school. In such a case most of the parents depend on the public transport or the school transport to avail the pick and drop services. During the school time the parent even do not have time to contact the school management to enquire about the kid's arrival or departure. When the kids leave home for school the main concern of the parents is there safe journey to school and from school to home. Most of the time the parents remain unaware of the state for their children. In the proposed project, we are going implement a smart solution based on the IOT domain using the face recognition. The project consists of three main modules like acquisition of the student's picture when they will enter the school, the second phase is the face detection, features extraction, and the face recognition, and the third phase is information dissemination to parents about kids arrival to school. The same procedure will be repeated in the classrooms to maintain the attendance of the kids based on the institution attendance rules and regulations. The project will serve two main stockholders of concerned parties i.e. the parents and the school. The parents will remain well aware of the student's arrival and departure at school, and the school will maintain the attendance of the students in a reliable manner. It will save the teacher time, which ultimate will improve the quality of education. In short, the project will keep the parents worry free, it will save the resources of school, it will save the teacher time, and ultimately, we can hypothesize that the quality of education will improve.*

[51] **Title of Paper: Revolutionizing e-tourism in Oman through Augmented Reality mobile app development**

Author(s): Ruqaiya Abdullah Ahmed Al Shehhi, Huda Sabri Rashid Al Mandhari,
Toka Ahmed Awad Haroun, Hanin Mohammed Moammer Mohammed
Abdulsalam

Affiliation: Middle East College, Muscat

Abstract: *Oman's vision 2040 aims to drive the new oil which owes to be the tourism sector in Oman for improving the economic growth. Since mobile technology is commonly used for navigation and interpretation, in the recent years, a mobile Augmented Reality (AR) app is perceived to be perfect for integrating visual attraction to provide a better experience for the tourists. An AR-based mobile app for e-tourism in Oman is currently not popular in Oman. It is proposed that there is a need to bridge the gap to better interpret and meet the traveling experience of tourists which in turn increase the tourism prospects in Oman. The main aim of this project is to develop an AR technology-enabled mobile app that guides the tourists in a smart way with an embedded vision of tourist attractions and provide the facility of a visual interpretation of landmarks. Hence, a technology-enabled app*

[52] **Title of Paper: Achieving Course Learning Outcomes through Directed Remote Learning (DRL)**

Author(s): Azza Rashid Al. Saidi Al. Saidi

Affiliation: Sohar University

Abstract: *This presentation intends to discuss how one of the higher educational institutions helped its students to achieve the course learning outcomes. As everywhere in the world, classes were suspended in Oman due to the pandemic, Coronavirus (Covid-19) in March 2020. However, in no time, the educational institutions in Oman swiftly shifted to online classes. Embedded in a sociocultural approach, the presenter's university adopted a Directed Remote Learning (DRL) and defeating all odds the instructors and the management provided the students with some of the best practices they have experienced so far. The university adopted as Task Based Approach and the students worked around four major content areas. At the end of each fortnight, there was an assessment. Using the Moodle application to its maximum capacity, the Faculties held lectures through MS Team Meetings, tutorials in the forms of Student Discussion Forums and practice exercises. As students could access the recorded interactive lectures, see the rest of the class's work and the constructive feedback given to them, their learning experience got enhanced. It was evident that even the inhibited students are now eager to participate. In addition to the MS Team meetings, WhatsApp, Big Blue Button and Email are being used to aid learning the throughout task period. Collaborative learning and peer revision were of great help for all, especially for the weak students. The pandemic has opened new avenues for the instructors and students. Although it may curtail the practice of several hand skills for engineers and doctors, the DRL served the language programme well.*

[53] **Title of Paper: Analysing the Impact and Influence of Big Data**

Author(s): Ghadeer Al Mohammedawi

Affiliation: National University, Muscat

Abstract: *The information highway has changed the way information is used and stored. The phrase “click of a button” has become a way of life and students are not far from it. Gaining knowledge has become totally interdependent on the internet. Previously, information was location and time bound, has now become 24/7. “Soft copies” are more desirable than “hard copies”. Everything can be cut, copied and pasted. With advancement and easy availability of these devices and by installing various applications it can easily elicit every type of information that is needed by different organisations. The aim of the paper will be examine all these in relation to understanding big data, what it means and how the different types are useful. Also, it will analyse the characteristics of the 3Vs: the large volume of data in many environments, the wide variety of data types stored in big data systems and the velocity at which the data is generated, collected and processed. Followed by how this huge information about everything and everyone can be used by companies to make their business better. Besides companies, big data is also used for “social medial listening, marketing analysis and customer service”. All these uses have their positive and negative points. Lastly, the paper will evaluate the human side of big data analytic. How much of this is changing during the pandemic time of COVID-19?*

[54] **Title of Paper: Novel iChip Technology and Antibiotic Resistance – A Need of the Hour for Today’s Pandemic Crisis**

Author(s): Tasnim Hamad Salim Al Rajhi, Hiba Al Wahaibi, Dhana Uml

Affiliation: National University, Muscat

Abstract: *Development of antimicrobial resistance is a major concern all around the globe when it comes to the novel antibiotics/agents especially during ongoing pandemic of coronavirus disease 2019 (COVID-19). Recently, scientists are able to develop a new and innovative approach called iChip that allow uncultivable organisms to grow and observe their antimicrobial activity. Teixobactin is a first member of newly discovered pharmacological agent that was recently identified from *Eleftheria terrae* by using iChip technology. Moreover; teixobactin is recognized as a potent antibacterial agent against various Gram-positive bacteria, including Methicillin Resistant *Staphylococcus Aureus* (MRSA) and Vancomycin Resistant Enterococci. While discussing the mechanism of action of teixobactin it has been hypothesized that the action may include binding to the essential microbial cell wall synthesis building blocks lipid II and lipid III that may help to act against virus. Based on the need of the hour, this abstract focuses the importance and the efficiency of iChip techniques and its applications for the anti-viral activity and the discovery of novel antimicrobial agents.*

[55] Title of Paper: Online Classroom Reservation System for Staff and Students for ICT**Author(s): Wjood Nasser AL Malkiya, Ameera Sultan AL Hashmi , Sheikha Salim****AL Suliamiy and Suresh Gowdanakatte****Affiliation: Ibra College of Technology**

Abstract: *The education is like the oxygen for person because the knowledge is like key which open the door for people to see the wonders and bounties of this world. And to reach to this knowledge we need tools. One of the important tool in the current time is computer because the world now do most work by this tool. As Ibra College of technology is one of the organization who depends on computers in education. So the students need to use this tool at most time. Wherefore we have prepared reservation system to reserve the classroom(labs) and pc to help the students to get computer to complete her/his work and study. Also this system helps the teacher to change them class. If he/she finds a necessity for that.*

[56] Title of Paper: IoT BASED VEHICLES AUTOMATIC ACCIDENT ALERT AND RESCUE (VaaaR) SYSTEM**Author(s): Amna Mohammed Saif Al-Mamari, Miytha Ali Abdullah Al-Risi, Ebtsam Hamed Al- Essai, Dr. Venkadesh R****Affiliation: Shinas College of Technology**

Abstract: *The rapid rise of technology and infrastructure has made our lives easier. The high demand of automobiles has also increased the traffic hazards and road accidents. Life of the people is under high risk. The lack of communication to the other travelling vehicles in the same route will lead to more traffic and congestion. The delays in communication to the ROP and ambulance to the accident location increase the chances of death of the victim. To overcome these problems our proposed alert and rescue system comes to the picture. This proposed IOT based accident detection system helps to reduce the loss of life due to accidents and reduces the time taken by the ROP and ambulance to reach the accident place and also alert the other vehicles about the accident which could reduce the traffic further. This automatic alert and rescue system project is very much useful and efficient in detecting the accident and communicate the rescue team in reasonable time. To detect the accident there are Micro Electro Mechanical System (MEMS) sensor and Vibration sensor present in this system, the GPS module in the system will coordinates the location of the accident and the GSM module included will send a message about the location to the ROP and to the respective guardian of the victim(s). With the help of Vibration sensor signal, a severe accident due to an obstacle can be recognized. The amount of rolls of the vehicles can be identified by MEMS sensor. Microcontroller used, sends the alert message through the GSM module including the location through GPS module to guardian or/and a rescue team. So, the emergency help team can immediately trace the location through the GPS module, after receiving the accident location information, action can be taken immediately. This accident detection system is powered by microcontroller like Arduino and Raspberry Pi consists of display, MEMS sensor, vibration sensor, GSM module, GPS module and alarm.*

[57] Title of Paper: A Review: Can the De-extinction of Mammoths save the world from global warming?**Author(s): Arooj Fatima Tul Zahra, Nabiea Shehma, Clarence Tay Yuen Hua****Affiliation: Swinburne University of Technology Sarawak, Malaysia****Yangtze University, China**

Abstract: *The world is going through severe global climate changes in the form of global warming. With the Earth's rising temperature, greenhouse gases are expected to increase substantially as well in the coming decades due to anthropogenic activities. Among the most affected areas of the earth due to*

global warming, the arctic tundra is going through severe climate changes. Arctic permafrost is thawing, and the huge amounts of carbon and other greenhouse gases that were trapped inside the permafrost, are continuously released into the atmosphere. The rate of thawing is expected to increase every year, exposing the world to massive amounts of carbon stored in the arctic permafrost and causing severe climate change. Scientists have proposed the resurrection of mammoths as a possible way to stabilize the arctic ecosystem and slow down the thawing process. Projects like the woolly mammoth revival are working on producing hybrid elephant-mammoth embryos and using the species to re-establish the mammoth steppe and slow down the current thawing. This review looks into the causes of the climate change and the effects of global warming on arctic permafrost. It further discusses the possibility of mammoth revival as one of the possible ways to tackle the global warming and the current progress of the woolly mammoth revival project in the de-extinction of the mammoths.

[58] **Title of Paper: A review: Genetic Interactions of micro plastics with cyanobacteria in the aquatic environment**

Author(s): Arooj Fatima Tul Zahra, Nabiea Shehma, Clarence Tay Yuen Hua

Affiliation: Swinburne University of Technology Sarawak, Malaysia.

Yangtze University, China

Abstract: *The accumulation of plastic in the oceans and other water bodies as fragmented debris has become a big environmental issue in the world. Plastics found in the ocean are dominated by the smaller sized plastic debris also known as microplastics (plastic size < 5 mm). These microplastics pose a serious threat to marine life and the ecosystem of the water bodies by interacting with marine life and disrupting the food chain. Microplastics can easily find its way to the gastro-intestinal tracks of many marine species. They block their digestive tracks, altering their behaviours, harming their reproductive systems and effecting their genes. Another problem that is hitting the water bodies besides microplastic pollution is the sudden rise in the growth of blue-green algal blooms. These bacteria release cytotoxins which are harmful for the marine life and the environment. With the increase in studies showing negative effects of microplastics on marine animals, researchers are looking into the interactions of microplastics with microorganisms in the water. Plastics staying in the aquatic environment are becoming hosts to the microbial community forming a new marine ecosystem called a "Plastisphere". Cyanobacteria is one of the dominant bacterial species among the plastisphere microbial community. Scientists are concerned that these plastisphere communities might be getting affected genetically by the microplastics. These interactions might pose further threats to the marine ecosystem. This review looks into the studies conducted to see the interactions between marine microbiota especially cyanobacteria with microplastics. The genetic effects of microplastic on cyanobacteria was also discussed in this review.*

[59] **Title of Paper: Predictive Analytics Based E - counselling System**

Author(s): Emran Huda, Sundresan A/L Perumal, Amin Al Haadi Shafie, Mujahid Tabassum

Affiliation: University Sains Islam, Malaysia

Abstract: *Counselling has become an important source of support to overcome psychological issues which can be derived from conflicts arising in personal, financial, work, marriage, education and social aspects. Foreseeing the increase of needs and demands of therapist undertaking on psychologically deterring society, web counselling could be the first-stop solution to diagnose the public's mental health problems or provide guidance where it is required. The commonly practiced psychological treatment or support being provided at the current time is still handled in the*

conventional way, which mainly comprised of, in person meetings or filling up hard copy questionnaire for the counsellors' evaluation. Therefore, whatever the problem might be, a client (patient) has to visit the counselling center to seek any kind of support, which could be troublesome as it can be time consuming, especially for students who has rigid academic schedule. Web counselling can help to speed up the diagnose process as the standard methods can be highly time consuming. Although there are some online based systems available, but they are just working as a communication medium by utilizing messaging or chatting features. In some cases, the online systems are providing services just limited to appointment or reporting a problem. In this case, a system based on predictive analytics algorithm will be developed so that it will be able to produce more precise and faster diagnosis and not just act as a communication or appointment tool. Despite such approach, the system however does not entirely omit the human interaction nature of counselling, but rather focuses on a more reliable collection and analysis of the client's / patient's data. Moreover, it can be used in any field of counselling and in this case, focus is being given on career development counselling. There are various collection of counselling tools available some of which are in the form of questionnaires, broadly used by counselors to help their clients. Such an instrument called "Self-Directed Search (SDS)" will be utilized here. Self-Directed Search (SDS) questionnaire was developed by John Holland, one of the pioneers in the field of counselling. In this questionnaire there are specific set of questions which has been developed to identify the best suited career path for the person taking the test. Once the result has been achieved, then according to the outcome best suited jobs can be categorized. Qualitative method will be implemented to accomplish the final product and lastly, agile software development will be utilized to develop the web application (system).

[60] **Title of Paper: An Advanced Composting Processing Technology using IoT and Deep Learning: An impeccable solution for Municipality and Fertilizer companies**

Author(s): Nawal Abdullah Ahmed Al Washahi, Marwa Hamdan Khalid Al Busaidi, Hanan Ismail Bader Al Mamari,

Affiliation: College of Applied Sciences, Sohar

Abstract: *The idea of our project is a smart garbage collecting system that isolates two types of garbage, food and plastic waste, through a sensor that determines the type of garbage placed in the bin. We need this bin because it has many benefits. Firstly, it will provide a great effort for workers in the municipality to isolate two types of garbage and this facilitates the work of the municipality workers and those responsible for gathering garbage. Secondly, the bin will provide a safe environment, because when the bin has food leftovers and other garbage together in the same bin it causes odors, and therefore spreads germs and viruses in the air, and sometimes leading to infectious diseases. Thirdly, it helps simplify the plastic recycling process because it collects all the plastic materials in one place. Also, this makes the municipality could sell the plastic directly to the plastic manufacturers for recycling it. Without doubts, there are studies about the current system that is working on collecting all trash together then the process of distinguishing came manually by workers. In other words, it's all about only collecting trash in one garbage container all around especially in Oman. Our system provides one throw of garbage and gets separated with wet leftovers and plastics. In the short term, it directly makes a difference to the way that people used to get rid of their garbage which also improves their knowledge about it, as well as a clean environment to protect people from diseases. In the long term, it refines and upgrades their consumption and financial system. This system benefits the recycle industry such as fertiliser companies and plastic companies. Our system incorporates notification systems that deliver the on time notifications to the two industries to collect the garbage. The technological part of this project uses Python and OpenCV with a Deep Learning*

method to separate the garbage with the help of IoT where the hardware part will be implemented using different sensors. The sensor will detect the type of waste if it's food or plastic and then separates them in two different bins. In the end, we will monitor the bin based on the data that we received from the hardware part. Deep learning technologies refer to a subfield of machine learning concerned with algorithms inspired by the structure and function of the brain called artificial neural networks. These deep learning packages are used in industries from automated riding to medical gadgets, for instance in computerized driving, in Aerospace and protection and in Electronics. In our project, this deep learning algorithm plays a considerable function in obligations inclusive of recognizing the objects to separate with discovery of wetness and toughness with plastics and other objects in garbage, with the superior strategies and technologies inclusive of big statistics used for processing very big datasets consequences in giving the predicted output via powerful recognition of wet food leftovers and plastic leftovers. This Deep learning technology with IoT sensors will provide an accurate delivery of garbage to the fertilisers and plastic companies. Hence, our project is clearly aimed perhaps for the research patents with our unique and novel idea of a smart garbage collection system. Therefore, this project also obviously reaps benefits for the environment and municipality/industries by reducing human involvement of separation of garbage and preventing vulnerable diseases.

[61] **Title of Paper: A satellite Approach for monitoring Smart city: A prototype design and implementation**

Author(s): Safaa Khamis Mubarak Al Junaibi, Marwa Khamis Mubarak Al Junaibi, Maisaa Abdullah Khuseib Al Omairi

Affiliation: College of Applied Sciences, Sohar

Abstract: *Smart cities are the avenue for many Smart events. Such as sensing and monitoring using Smart devices, and are connected to each other in order to provide valuable service to people. In this paper, we will explain our project. In our project we cover up the whole city with new technology followed by the Low orbiting Satellite (LEO) and creating Industry revolution. We connect the satellite with drone-bot and drones Contact with the administration in the Smart city. How it's work? First Suppose that an emergency Situation happen. In this project we Corer up (health hazards, water pipeline networks, traffic, and fire services with Comprehensive coverage.) So, if any one of this emergency situation occur the IOT Sensing device will sending messages to the drones then drones will Contact with Satellite then the satellite will authorities in this case. And from the other side this project also, Support the Service unavailability and support the service reachability. It is work when the users go out of the Smart city then the drone-bot search for the appropriate Satellites to create Scalable services in Smart city. Therefore, the user never experiences a deficiency of services in the Smart city as the System provides the services continuously. This system is reliable in providing extended Coverage for the Smart City Service.*

[62] **Title of Paper: Analytical Study On The Evolution Of Ransomware Over The Years**

Author(s): Jinal Bakhai, Mohammad Ubaid Ur Rahman

Affiliation: Waljat College of applied sciences

Abstract: *Over the years, technology has evolved the world and its day-to-day events. Using this technology, we have created computer's which are revolutionary and are high-speed data processing units. When multiple computers are connected together, they have the ability to work as one single computer, which is termed as network-of-network or the internet. Cyberspace is a powerful simulated area that is created by these inter-connected networks. With the advancement in technology, the human*

behaviour has also evolved in order to cope up with it. When the internet was composed, the creators were not aware of the fact that it could be used for malicious activities on such a large scale. Today malware has become one of the growing concerns of the world in terms of computer security and privacy. An individual's/organization's data is no longer secure on the internet. Hackers have been using various types of malware to attack users. Malware is a malicious software, code or a script which is used to harm computers and their systems. There are various types of malware attacks occurring, out of which the 5 most common types are trojan-horses, spyware, worm, viruses, and ransomware. In this paper, we will be discussing about the types of ransomware and their evolution over the years. Ransomware is a type of malware that holds your data apprehended for the personal benefit of the hackers. It blocks user access to the computer by encrypting the files or by shutting down and locking the entire system with flashing messages that are meant to force the victim to transfer the payment to the attacker in order to release the captured data. Despite of the fact that ransomware has been around since long time, its variations are becoming increasingly progressive in terms of encryption of data, sniffing and movement within the network, dodging recognition and manipulating files. A detailed timeline with analytical explanation showcasing the advancements in technology for various types of ransomware attacks has been discussed in this paper.

[63] **Title of Paper: SHCT Student Counselling Management System (SSCM)**

**Author(s): Younis Khamis Al-Jabri, Hajer Ahmed Alsinani, Aisha Suleman Al-Maamari
Aysha Al Jabri**

Affiliation: Shinas College of Technology

Abstract: *Believing in the importance of the role of psychological counselling and guidance in the life of the student, the “Counselling and Graduate Follow-up Department” was established in Shinas Technical College, with the aim of providing psychological, social consultations to students within a future vision with support of college employees, their families and members of society within the framework of an integrated guiding centre interconnected with society and supports the scientific excellence of the student and sponsors their creative talents and strives hard to create a constructive compatibility between students who are disrupted in their study and between environment fertile college to achieve desired success and even excellence in it. It is a dedicated system that brings together a number of counselling staff in a complete privacy and confidentiality to provide counselling, and assistance to students taking an advantage of their personal abilities and skills in discussing issues and problems that may interfere with their academic life. Understanding it and trying to find solutions to the case its capabilities by providing it with indicative information and benefiting from the scientific experiences obtained by student guides, whether these problems are social, behavioural or economic. The researchers used the spiral model in the development of the system. System requirements were captured using various data gathering techniques and were represented using Use Case Diagrams. The researchers designed user interface prototypes to visually represent the user requirements and the system workflow. The data design of the system is modelled through Entity Relationship Diagram. The online platform is designed with a multi-tier architecture. In the implementation, the researchers used PHP as the scripting language and MySQL for the database. Various testing strategies were performed to validate the required functionalities and to ensure the quality of the system. To solve the problems encountered in the current system, SSCM will be implemented with the central database to keep students' and consultation sessions' records in one place for easy, fast and efficient way to process and access them whenever needed. Despite the automation of most tasks, there are still manual work that need to computerized to make the process of consultations full automated like including parents' module, student's referral form to counselling services, integrating the academic consultations with SSCM, and finally integrating SSCM with Colleges Information Management System (CIMS).*

[64] Title of Paper: A Study on Acceptance of Online Shopping by Male Shoppers**Author(s): Nasra Hammad Al-Amri****Affiliation: Higher College of Technology, Muscat**

Abstract: *Nowadays shopping online is becoming very popular in Oman. It has been noted, however, that male genders support less in online shopping. In this research, the reasons why male shoppers are less interested in shopping online will be explored. The research would concentrate on the study of various factors including quality of the product, risk, experience, security, and delivery. In this research will apply the different method to achieve our goal, 5 objectives were applied, and 7 hypotheses were created. The study will help males who are interested in online shopping and a new company in Muscat. The survey-based research is used on males located in Muscat. The questionnaire is used to gather data and the sample size is 123 respondents. The targeted population is males aged (18-40) in Muscat includes student, employed, and non-worker males. 74.8 percent is the highest online shopping preferences, and 25.2 percent do not enjoy e-shopping online. The main finding in this study, the male is interested in online shopping and according to age from (18-40 Years) are more interested. The working and studying they cover the biggest percentage than non-working, singles males are using online shopping than others. The income of males using online shopping is 90 OMR. The type of product shopping they preferred is a travel and they do online shopping once in 6 months. The main factor affecting online shopping is product quality.*

[65] Title of Paper: Intelligent GreenHouse**Author(s): Yaqoob Yousuf Said Alawfi, Murshid Qasim Mohammed Almaawali,****Almahalab Said Aamir Alabri, Gnana Rajesh****Affiliation: Al-Musanna College of Technology**

Abstract: *Today, agriculture is the most important challenge for humankind, as the environmental impacts of climate change, the increase in the number of people on Earth, and the decline of arable land constitute a threat to food security. This study examined the development of individual farming methods and institutions using the techniques of the fourth industrial revolution - the Internet of Things and artificial intelligence - in the Sultanate, which meant to rise the efficiency of agricultural production and minimize the impacts. This research aims to help the farming sector around the world by minimizing the environmental challenges. The intelligent greenhouse is the next generation of the current greenhouses used in in-house farming techniques. This research was applied as a diploma project at Department of Information Technology, Al-Musanna College of Technology for the first semester of the academic year 2019/2020 and it concluded the following results :Using artificial intelligence to control greenhouses in terms of irrigation times and quantities, controlling the temperatures inside the unit according to the type of the cultivated crop, would boost production and significantly reduce the financial burden, reduce water consumption. Continuous monitoring of crops through the accompanying application, which in turn will include a database on crop types, the amount of water required for irrigation, times, temperatures, as well as the season in which production is promoted with high efficiency, and therefore the system adapts to the variables according to algorithms that contribute to improving the environment within the unit .Enabling the user to control the units remotely by linking the system and monitoring it via the Internet through an effective platform that allows controlling the variables as needed manually or automatically, as this contributes greatly and makes it easier for developers and technical support to access and provide technical support for minimum costs and the fastest time .The tools used in these simple units are available in the local market and there is no need to import them, and the system is designed to fit in with the area of*

agriculture, which in turn contributes to reducing the potential spending material return .The system is easy to use for individuals or institutions alike which can adopt the system or switch to this system smoothly.

[66] **Title of Paper: A Study of Digital Transformations in banking sectors for School Students in the Sultanate of Oman**

Author(s): Zahra Musallam Khasib Al Rawahi, Vikas Rao Naidu

Affiliation: Middle East College, Muscat

Abstract: Digital technology has profoundly altered nearly every aspect of our lives. Incredible advances in computing, the growth of artificial intelligence and the emergence of big data are transforming all facets of life and work in leaps and bounds. As a result, the skills that are required to enter go beyond what is traditionally taught in schools. Sultanate of Oman is one such country which is continuously working towards the adaptation of latest trends and technologies in almost every sector in order to boost the economy of the country and provide various opportunities to its residents. Banking sectors are playing a vital role by working on various strategies so that the residents/account holders could invest for future usage and long-term plans. As a part of this, one of the leading banks has introduced a program called 'Little investor'. Little Investor program was conducted for elementary and preparatory school students. They were introduced to business and economics with a focus on mathematics, reading and writing skills. The module was aligned with their school curriculum and it encouraged students to apply creative thinking and social skills to learn financial management. Students were engaged in the number of interactive and informative sessions using group-based activities and a specific set of materials designed specifically for this program. The program motivated students to have ambitions related to their career and created awareness on the relevance of this knowledge in their real world and the value of their contribution to the local and national economy. This research paper studies and analyses the requirement of digital transformations with advanced technologies for school students in Oman based on the findings from above study. The methodology used here is mixed methodology (both quantitative and qualitative) and the tools for data collection used here are Questionnaire and Interviews. Based on the results of analysis, the authors will provide their findings, recommendation and conclusions, in order to justify if this program at this level would be helpful for the children at the school level or not.

[67] **Title of Paper: A systematic review of IoT based Assistive technology devices for Dementia care**

Author(s): Smitha Sunil Kumaran Nair, Ahmed Mohammed Nasser Al Qassabi

Affiliation: Middle East College, Muscat

Abstract: (Margaret.R 2020) The Internet of Things is a system consisting of interconnected computerized devices, mechanical and digital machines, things, animals or people that are provided with unique identifiers (UIDs). It can be said that it is the ability to transfer data across the network without the need from human to human or human interaction to the computer. Dementia can be defined as a brain disorder that destroys thinking and memory skills, slow paralyzing human thinking and making slow implementation of human-specific tasks. This disease affects all ages categories, but the greater percentage effected by oldest compare to the smallest ages categories, where more than 15 million American volunteers were estimated to care for this group of Alzheimer's patients, and forms of dementia are valued at more than \$ 230 billion annually. With the increasing number of families that take responsibility for caring for this group, it was necessary to search for appropriate solutions that may limit and reduce the burden on the families responsible for this category of Alzheimer's patients.

Doctors and medical professionals have been searching for solutions associated with the Internet of Things to help reduce the burden of for families and to improve the lives of Alzheimer's patients, wearable devices and smart home technologies, as this Internet technology enabled Alzheimer's patients to live independently and avoid many of the risks that may occur to this category. The aim of this study is to review the existing IOT Based assistive technology for dementia care. The methodology used is secondary data collection from previews literature review which justified the how the IOT play an important part in health in treatment the dementia categories. There are a lot of innovations created to help Dementia people and their caregiver for Insure for better life for them, such as CareWatch, COACH, and CareMedia in addition to the sensors such as Fall Detectors and Environmental Sensors. Much of the studies have come about on the outcome of Alzheimer's disease, dementia and cognitive impairment with innovative assistive technologies. Electronic circuit-based information and communication technologies (ICT) were used in this study. one of the study was applied to 1,655 participants from the USA, Canada, Australia, Europe and Asia. The aim of the study was to support cognitive disabilities in safety and security using home sensors and dressing equipment. It was found that 80% of caregivers were unaware of the use of assistive technologies. It has been recognized that the use and knowledge of innovative assistive technologies is essential for service providers and helps to succeed in innovative programs aimed at the independence of the elderly and people with dementia (Thordardottir et al. 2019). Another interesting research was the development of a chip being embedded in the patient's cloth so as to avoid situations in case the patient is potentially in dangerous conditions when left alone, accordingly the caregivers could take actions (Zucchella et al. 2018). However, all AT devices cannot be generally applicable but customized to the needs of the patients and caretakers for an effective result. (Vuong et al. 2013) the Innovations continues, Mobile based health apps have been developed to monitor the behavior of patients that have been tested successfully however in the indoor environment for example iWander, this app allow the caregiver to monitoring the motion of dementia people in an indoor environment (Sposaro et al. 2010) . Assisting robots, biometric sensors, motion sensor technology, intelligent assistive technology for intelligent home connections, multimedia intercommunication systems and Internet access are technologies that help to improve the daily performance and quality of the life of people with Dementia related illnesses (Bharucha et al. 2009). All the studies display the role that IOT play in change the life of some categories especially Dementia patients people. The output of my study can be expected to be as product, added to Scientific innovations and in the same time extracted as literary journal to display for the audience to transfer how the IOT play a large major role in health to produce helping solutions keep pace with the technical revolution.

[68] **Title of Paper: Assistive Technology for Visually Impaired: A Review**

**Author(s): Smitha Sunil Kumaran Nair, Awatif Mohammed Ahmed Al Harfiawatif,
Mohammed Ahmed Al Harfi**

Affiliation: Middle East College, Muscat

Abstract: *Assistive technology is a service that directly helps people with special needs to choose, acquire or use assistive technology, as it enhances the independence of individuals with special needs to improve job or performance capabilities so that they can perform their own tasks without the need for support from other people, there in this study going to allocate the category of the blind. By this technology, blind people can do many things, such as surfing the Internet, writing documents, exchanging e-mails, and electronic aid is distributed according to the type of visual injury. This technology - generally known as assistive or adaptive technology - is constantly evolving, and has removed many barriers for blind people. The aim of this research is to review current auxiliary technologies that support the blind and how the growth of assistive technologies has affected the blind*

group The methodology used in this study relies on secondary data collection from some review of previous literature used assistive technology in the stick, smart cover, ancillary mobile application and others new creative technologies assistive. Several studies have been reported that deals with the category of blind people and their needs, most of the studies focuses on modern assistive technologies that based in smart app, which guide the blind people to their direction without deepened on others and cover most the blind people requirement, most applications were created on guiding the blind through the audio commands to identify currencies, pictures and the e-book. These applications help by using voice commands to identify the things surrounding the blind from objects. one of assistive technologies used to help blind people and save them from fraud and deception is how to read the currencies, these studies depend on the calculations of the vector-oriented FAST and BRIEF (ORB) algorithms. One such study resulted in an assistive technology to help the visually impaired out of any catastrophic situation that other citizens might do. It is a "smart cover" that can be worn which is cost-effective. Smart Cap provides an overview of the surrounding environment with user-to-person communication for the visually impaired through a rich reservoir of knowledge base system capable of speaking sounds. As evidence of the concept, this study was performed using Raspberry Pi, Amazon Web services and P-Cap with a camera. The results of studies have shown that the assistive technology that created to blind people make changes in their life, and make the blind people depended on their self even in a simple ratio, the results of my study expected to be an article journal, to benefit all categories which interested to take care about blind people with the help of assistive technology.

[69] **Title of Paper: Financial Risk Factors of Islamic Banking: A Case Study of Maisarah Bank**

Author(s): Balaqis Nasser Khamis Al Saadi

Affiliation: Middle East College, Muscat

Abstract: *The study of issues related to risk management in the Islamic financial industry is an important but thorny topic. The current study has discussed and analyzed a number of issues related to this topic. First, it has comprehensively reviewed the concepts of risk, management methods and standards in accordance with what exists in the financial industry. Second, the study conducted a survey of the risks that are unique to the Islamic financial services industry and the perceptions of Islamic banks about these risks and then analyzed the results of the questionnaire for that. Finally, the conclusion included some conclusions and contents related to the risk management policy. The study concluded that the liberalization of financial markets is accompanied by an increase in risks and financial instability. By using risk management processes and methods, financial institutions control the risks they do not want and reap the benefits of investment opportunities that come with the risks they desire. These processes and risk management methods are important to monitors and supervisors because they determine overall efficiency and stability in financial systems. The study showed that Islamic financial institutions face two types of risks: the first, of which it shares with traditional banks as - i.e. Islamic institutions - financial means. These include credit risks, market risks, liquidity risks and operating risks. However, due to adherence to Islamic principles, the nature of these risks changes in the case of Islamic banks. The other type of risk is new and unique to Islamic banks in view of the distinct components of their assets and liabilities. It follows that the processes and methods available to Islamic banks to identify and manage risks are of two types: standardized methods that do not conflict with Islamic financing principles, and new or modified methods taking into account their own requirements.*

[70] **Title of Paper: Agriculture App**

Author(s): Khawla Khamis Alkindi

Affiliation: Higher College of Technology, Muscat

Abstract: *As we know Oman is an agricultural country as it has different climates which are suitable for different crops to grow, and different soil types that give chance of growing different types of crops. Old Omani people were working on that since the beginning of their life. So, agriculture works is an important part of our culture and until now most of people working on it both men and women, as well Oman export some of this crop or even goods that come out from the farms to the other countries from the years before until now, and day by day they always try to improve the productivity process of that sector as an economic sources. I was thinking about something modern that can give this activity some technical touch, and make its process faster and easier, and to keep up with nowadays life. As all of our shopping right now could be done online in a short time and just by a click. Agriculture activities could be done online as well in an easy way. The idea of the apps is consisting of different parts, in general the main reason behind this app is to collect everything related to agriculture activities in one site for both the consumer and the owner and it will benefit both of them and make their life easy. First, how it will benefit the owner: the app will be containing the following services: veterinarian(to treat the animals in the farm, just they select the location, and search for the nearest and best veterinarian for them.), seed and fertilizers and agriculture tools(select the location, and search for the nearest and best market sell that item they need, and they will be deliver to his/her farm or home if he/she have its own small garden in his/her home), transporting the crops, meat, milk, honey, fish if they are fisherman or any other product come out from the farm to the markets directly, and many other service that will help the owner and make their works easier and less cost. How it will benefit the consumer: the app will be containing the following services buying the goods “animals, crops, honey, plant, seeds, ...” (select the location, and search for the nearest and best farms directly that selling the product they need or even from the market that get its goods from the farms) and many other service that will benefit the consumer and help them to get what they want easily. By using this app, lots of cities and market overcrowding will be reduced, and as result the air pollution will be reduced, as well the prices of goods will be less as they will buy them directly from the owner, and the goods will be fresh when they reach the costumer as they will reach to him/her in a short time just by one click in his/her cell phone, then the order will be received.*

[70] **Title of Paper: COVID-19**

Author(s): Samah Said Hamed AL Sarhani

Affiliation: Sur College of Applied Sciences

Abstract: In the past decades, several new diseases have emerged in new geographical areas, with pathogens including Ebola, Zika, Nipah, and coronaviruses (CoVs). Recently, a new type of viral infection has emerged in Wuhan City, China, and initial genomic sequencing data of this virus does not match with previously sequenced CoVs, suggesting a novel CoV strain (2019-nCoV), which has now been termed as severe acute respiratory syndrome CoV-2 (SARS-CoV-2). According to the Coronavirus Study Group of the International Committee on Taxonomy of Viruses. SARS-CoV-2 belongs to the Coronaviridae family, Beta coronavirus genus, subgenus Sarbecovirus. Since its discovery, the virus has spread globally, causing thousands of deaths and having an enormous impact on our health systems and economies. Coronavirus disease 2019 (COVID-19), started on late December/ 2019, in Wuhan in China killed over 400,000 people and infected over 7 million around world, resulting in catastrophe for humans. However, COVID-19 has lower severity and mortality than SARS but is much more transmissible and affects more elderly individuals than youth and more men than women. Early diagnosis by real-time PCR and next-generation sequencing has facilitated the identification of the pathogen at an early stage. Since, no antiviral drug or vaccine exists to treat or prevent SARS-CoV-2, potential therapeutic strategies that are currently being evaluated predominantly stem from previous experience with treating SARS-CoV, MERS-CoV, and other emerging viral diseases. The aim of this paper is to review the biotechnological aspects of coronavirus "COVID-19", brief history of COVID-19 research, diagnosis, treatment, prognosis, and prevention of the disease, and preventive measures that have already been globally recommended. Although many questions still require answers, we hope that this review helps in the understanding and eradication of the threatening disease.

Coronaviruses belong to the subfamily Coronavirinae in the family Coronaviridae. Different types of human coronaviruses vary in how severe the resulting disease becomes, and how far they can spread. Doctors currently recognize seven types of coronavirus that can infect humans.

Transmission of COVID-19: Limited research is available on how HCoV spreads from one person to the next. However, researchers believe that the viruses transmit via fluids in the respiratory system, such as mucus.

Coronaviruses can spread in the following ways:

Coughing and sneezing without covering the mouth can disperse droplets into the air. Touching or shaking hands with a person who has the virus can pass the virus between individuals. Making contact with a surface or object that has the virus and then touching the nose, eyes, or mouth.

Symptoms: Symptoms vary from person to person with COVID-19. It may produce few or no symptoms. However, it can also lead to severe illness and may be fatal. Common symptoms include fever, breathlessness, cough, it may take 2-14 days for a person to notice symptom after infection.

Treatment : There is no treatment of coronavirus until now, on the other hand they use antibiotics to protect from COVID-19. WHO works in high efforts to get and attain vaccine and drugs to protect from COVID-19 and its treatments.

Poster Presentation

[1] **Title of Paper: Impacts of Smart Devices on Cycle One Children: A case of Muscat**

Author(s): Afrah Al Hajri, Lamya Al Shaikh, Dr Maryam Al Hinai

Affiliation: Higher College of Technology, Muscat

Abstract: *Children nowadays spend their time using smart devices rather than spending their time playing traditional games. These smart devices have different impacts on children. Therefore, we distributed online questionnaire to Omani parents how have children from grade 1 to grade 4 to identify the impacts in term of school performance and behavior. After collecting data from parents and analyze it, we found that hours spent by children on using smart devices. In other words, spending more hours on using smart devices by children will affect their behaviors negatively but it doesn't affect their academic performance. Where there will be greater chance to get oppositional defiant disorder and intermittent explosive disorder. Moreover, parents' occupation affect on usage hours, where employed and students parents allow their children spend more time using smart devices.*

[2] **Title of Paper: Animal tracking system**

Author(s): Safa Said Al Maamari, Jawaher Hamed Al Musalmi, Raqiya Amir Al Malki

Affiliation: Ibra College of Technology

Abstract: *Nowadays, the earth are facing an environmental crisis that affects the living area of the animals and make them in danger of extinction The main purpose of this project is to create a tracking system that helps to track and monitor the movement and the vital sign (body temperature) of animals that are vulnerable to extinction This device needed in situations where we have wide spaces such as nature reserve in which the animals needed to track their movement and monitor their vital signs to understand wither the animals in normal condition or not, and to know if that animal died.*

[3] **Title of Paper: Ibra Safari portal**

Author(s): ARWA SAUD AL HARTHI

Affiliation: Ibra College of Technology

Abstract: *Ibra Safari Portal is used to manage all the activity related to the Safari park. It is a web application: Book tickets from the park calendar, manage the booked times with approval or reject, create reports for the booked times with all details needed (daily or monthly), save the visitors from the troubles of booking service and help the owner to manage all the activity in the safari park. Mange the animals information (birth, death & updates) and tracking there health by doctors, Ibra Safari Portal will help the Vet to takes care of animals. Restaurants the users can check the menu online.*

[4] **Title of Paper: Experiencing the Impact of E-Learning during COVID 19**

Author(s): Laila Essam Abdelmonem

Affiliation: National University of Science and Technology, Oman

Abstract: *All over the world, during the ongoing COVID 19 pandemic, one of the most impactful aspects that was a concern for all was how to continuing teaching and learning. At a very short notice, online teach which an option before was, became a reality. Both teachers and students adapted, experimented and explored online learning. Electronic devices and the Internet, which were used more*

for personal or for entertainment reasons, overnight, became the only source of connection and communication among teachers and students. For both, e-learning brought about new changes and challenges which was different from face-to-face classroom learning. Learning online gave students more flexibility, and also, allowed them to choose content appropriate to their needs, interest, and skills. Students experienced different challenges in online learning, which made the whole journey worthwhile.

- [5] **Title of Paper: Developing an IoT System for Smart School Bus**
Author(s): Shaima Mohammed Alsabbagh , Abeer Rashid Alsidairi , Khadija (Sasikala)
Affiliation: Higher College of Technology, Muscat

Abstract: *This project is to design a complete IoT system to monitor and track student inside the bus. Smart school bus works on several facts. First, the tracking system where we will use the A9G module to track the bus location, the school admin and parents can determine the exact location of the bus. second, when the student enters the bus RFID will read the student information and match it to the bus database. Once the student tag the RFID (card) the name of the student will appear on LCD screen in front of the driver. When the student exits the bus they have to tag RFID reader to make sure that no one inside the bus and green LED will turn on, and if not all the names match the database while the student is entering a red LED will turn on. In case the driver forgot the student inside the bus and the force sensor will check if someone is sitting or sleeping on the set, the buzzer will turn on, a motion sensor will start work to sense any movement. SMS message will be sent to the school administrator and the driver using A9G module and Blynk.*

- [6] **Title of Paper: IOT Application to Identify Patient Wheelchair Falling Detection and Alert System**
Author(s): Muzna Ahmed AL salmi, Safa khalfan al hudaifi, Nouf Ali AL hkmani, Dr.Arul Kumar Natarajan
Affiliation: Ibra College of Technology

Abstract: *Old age people can cause weakness in the bones, and weak bones lead to health problems, which may cause them to fall from the wheelchair serious problems Some elderly people live in their homes alone Perhaps he is frustrated and nobody sees him. That's why we created IOT application to identify patient wheelchair falling detection and alert system project Who will help nurses or other people know if there is a fall and know the person's location The same device measures the individual's normal speed, as well as the person's direction to discover any sudden change that may occur It sends a signal to the patient's device If the alarm is wrong, the patient can press the snooze button.*

- [7] **Title of Paper: The Inventory Management System In Oman With A Study On The User Interface Issues**
Author(s): Asila Isehaq Al-farei, Marah Salim Alshuhaimi, Muzna Khalid Al-harthy
Affiliation: Ibra College of Technology

Abstract: *The fast growth of computing has made effective human-computer interaction essential (Beattie, A. 2020) Inventory management is a component of supply chain management that involves*

supervising non-capitalized assets, or inventory, and stock items. The study aims to find the user interface experience and gaps in Inventory management, The study focused on the furniture inventory in Gulf with respect to a web-based online inventory management system that is designed for the furniture inventory management in Gulf countries. GIFMS in a very user friendly and ready to access way which is the outcome of the analysis and the prototype is implemented as a deliverable of the GFIMS research project.

[8] **Title of Paper: Online Classroom Reservation System for Staff and Students for ICT**

Author(s): Wjood Al malki, Ameera Al Hashmi, Sheikha Al Suliami, Suresh G B

Affiliation: Ibra College of Technology

Abstract: *One of the important tool in the current time is computer because the world now do most work by this tool. As Ibra College of technology is one of the organization who depends on computers in education. So the students need to use this tool at most time. Wherefore we have prepared reservation system to reserve the classroom (labs) and pc to help the students to get computer to complete her/his work and study. Also this system helps the teacher to change them class. If he/she finds a necessity for.*

[9] **Title of Paper: Smart Water Level and Leak Detection System**

Author(s): Mariya ALShaaibi & Rayan ALShaqsi

Affiliation: Higher College of Technology, Muscat

Abstract: *Technology has proven in this era that it can solve most of the problems that society may face, and since one of the common problems is water leakage, this project aims to solve the problem of water leaks in homes by employing technology, the idea of the project: The first section: Detecting the leak and its places in the home pipes, where the application sends an immediate alert to the homeowner about the location of the leak, which helps to solve the problem faster thus reducing the quantities of leaked water. The second section: Detecting the water level in the tank so that the homeowner can know the level of water in the tank. Certainly, we are facing a problem while doing this project which is the high price of the sensors.*

[10] **Title of Paper: Smart Home – Using IoT, Fog and Cloud Technology**

Author(s): Mohammed al-sawafi, Azhar al-sharji, Mohammed Tauqeer Ullah

Affiliation: Ibra College Of Technology

Abstract: *The world is moving forward at a fast pace, and the credit goes to ever growing technology. The Internet is a living entity, always changing and growing. Internet of Things (IoT) refers to a future where every day physical objects are connected by the Internet in one form or the other, but outside the traditional desktop realm. The main aim of this poster is to develop technics in a home, to be smarter, three technics which are smart lights, gas sensor and temperature.*

[11] **Title of Paper: Smart kitchen security with Mobile Apps Security Monitoring**

Author(s): Anood Nasser Alhusaini, Faisal Abdullah alhasani, Maglang Leopoldo Jr

Affiliation: Higher College of Technology, Muscat

Abstract: *Fires found in cooking locations are still the major cause of death and loss due to residential fires. It has been found that the primary root cause of fires and gas leakage in the kitchen due to*

unattended cooking in kitchens. People go to the kitchen daily to cook their food. However, when there is a gas leakage, this will become a bad situation or if there is a fire occur without their knowledge. The main aim of the project to design and build a device that warns people when there is a fire, gas leaks and high temperature in the kitchen using the internet of things technology. Besides, designing a mobile application that will monitor kitchen security. This system tracks gas leaks and fires in the kitchen and offers rapid response times in case of leakage by designing and constructing a safe kitchen fire alarm system that can be used in the kitchens. If a fire is identified in the kitchen, the buzzer will notify the individuals at that location and send a warning. In addition, the fire will be extinguished using water sprinkler. Moreover, in the case of leakage gas in application, it will close the electric value from the gas cylinder directly, and the window will open automatically. In the case of high temperature in the kitchen, the fan will be opened automatically and the buzzer will be application monitoring as the appropriate solution to all above problems. The system result is play major role in reducing the most risk in kitchens and save people lives.

[12] **Title of Paper: IoT enabled smart school bus monitoring and notification system**

Author(s): Elham Saif Ali Alharthy, Wafa Anbar Humaid Al Alawi

Affiliation: Ibra College of Technology

Abstract: *According to the last 5 years, the number of students' deaths in Oman because the student forgot on the school bus is increasing. And this system aims to solve this problem. The name of the project is IoT enabled smart school bus monitoring and notification system. The main goal of the project developed a system on the school bus that can check all students who are leaving the bus. This system is developed by Arduino .that system helps to saves time and effort for both students and school. Also, the Safety of students inside the bus and avoiding problems such as forgetting inside the bus contains a fingerprint stored in the program and sensors for each chair to know people in the seat and also contains GPS. The Methodology has started the project by collecting all the information about the school bus. Then, we analyzed the system requirements to make the projects. Then, we designed the interface of the project requirements using data flow diagrams, etc. Then, code is written in Arduino and other Hardware like Fingerprint, LCD and Blynk. Finally, each module is tested with each other. The Achievements of the project keep students safe on buses, avoid the investigation for driver and school and maintain the school's reputation.*

[13] **Title of Paper: IOT Based Automatic Solar Panel Cleaner**

Author(s): Yaseen Mubarak Almalki, Mallak Saleh Al-Hizami

Affiliation: Ibra College of Technology

Abstract: *Internet of things (JOT) is the technology hot spot where many researches are going on and many inventions are done. The renewable energy is the field where almost all the countries are focusing on. Solar panels are the major part in renewable energy filed where the sun light converted to electrical energy which not only cost effective but also environment friendly. To get sufficient electrical energy we need to implement a vast number of solar panels. The problem here is, clean ing the solar panels periodically to utilize the solar pan el efficiently. In our proposed work is to identify an automatic cleaning technology of solar panels. Whenever there is a dust or fog reaches the threshold.*

[14] **Title of Paper: HCT attendance system by using fingerprint**

Author(s): Rehab Alkalbani, Mallak Alsarkhi, Huda Alghafri

Affiliation: Higher College of Technology, Muscat

Abstract: *The objective of this project is to design and develop a reliable fingerprint monitoring system that can be used to monitor student attendance at HCT. Enrollment in this way is expected to resolve problems with the manual method currently used in the college. The new system uses a scanner that is difficult to manipulate and is safer. It also includes a database to store student information and attendance records. The system will use Arduino for hardware specification and will use Android application for end users.*

[15] **Title of Paper: Air Pollution Monitoring System**

Author(s): Arwa AL-Hasani, Zainab Al-jabri , Areej Almajed

Affiliation: Higher College of Technology, Muscat

Abstract: *Air pollution continues to increase at an alarming rate, reducing the goodness of life around the world, and is a major concern for public health and urban environments. This poses a serious threat to the environment due to factors such as population growth, increased use of automobiles, industrialization and urbanization. In this project, an IOT-based method to monitor the Air pollution, temperature and humidity, a system is designed to reduce the pollution. In this system, two sensors MQ7 and DHT11 were used, then we added many sensors like: MQ2, MQ3 and MQ135. The MQ7 sensor is used to detect the level of CO2 in the atmosphere. DHT11 sensor is used to keep track of humidity and temperature readings in the atmosphere. Then, the readings will be available for the people to view the pollution level, temperature and humidity using a Blynk application with think speak web browser which use to analyze data. The Blynk application is also made to be connected with Positioning System using GPS card. Also, send alert for people by using GSM A6. At the present time, we have replaced Blynk with Android to show all readings that are stored in the cloud.*

[16] **Title of Paper: IoT Clever Security System for Community**

Author(s): Amira Abdullah Aljaafariya, Sumaiyh Mohammed Bani Oraba, Ramesh Palanisamy

Affiliation: Ibra College of Technology

Abstract: *Today in the current global scenario, the prime question in every girl's mind, considering the ever-rising increase of issues on people harassment in the recent past is mostly about her safety and security. This paper suggests a new perspective to use technology for people's safety. We propose an idea, which changes the way everyone thinks about people's safety. A day when media broadcasts more of people's achievements rather than harassment, it's a feat achieved! Since we (humans) can't respond aptly in critical situations, the need for a device that automatically senses and rescues the victim is the venture of our idea in this paper. We propose to have a device, which is the integration of multiple devices, hardware comprises of a wearable "Smart band" which continuously communicates with a Some component like GPS and GSM that has access to the internet. The application is programmed and loaded with all the required data, which includes Human behavior and reactions to different situations like anger, fear, and anxiety. With the help of all electronics devices store the information to the controller which can operate the system automatically with intelligence. Also, it has fingerprint each finger have function such as, pinky is used for sea problems, Ring finger used for healthy problems, Middle finger used for missing persons, Index finger used for accident and Thumb used for burning.*

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- [17] **Title of Paper: Smart irrigation system**
Author(s): Bushra Rashid Al-Hadi, Russell Diona
Affiliation: Higher College of Technology, Muscat

Abstract: *Many farmers use large portions of farming land and getting to and monitoring each corner of a huge large land becomes very difficult. There is sometimes the risk of irregular sprinkling of water. It results in crops of poor quality, resulting in further financial losses. The smart irrigation system was developed to optimize water use for agricultural crops. It also helps in conserving water by automatically providing water to the plants/field depending on the water requirements. In this project, using the latest IoT technology, this proposed project aims to change the traditional and classical ways of irrigation system and convert it to smart irrigation system using Internet of Things (IoT) technology and try as much to reduce some of the problems farmers are experiencing using the old ways of irrigating the farm. In this project, a soil moisture monitoring system, will be implemented using the best available and most suitable sensor in the market, to reduce and regulate the amount of water used in farming. The purpose of this device is to detect the soil's moisture content and water pump depending on it. All this information will be sent to the cell phone of the user by using GSM module to inform the owner of the farm about the process of irrigation system.*

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- [18] **Title of Paper: Smart Natural Disaster Recovery Plan for Fire incidents**
Author(s): Afrah Naaer AL-Rawahi, Shahd Hamed AL-Bahlouli, Salma Salim AL-Jafari
Affiliation: Ibra College of Technology

Abstract: *Today technology is an important and basic thing in our life. Internet Of things (IoT) is a new concept in information technology, one that is a new concept that is connected to all activities through the Internet. so that people can monitor/operate anything from anywhere. In this project trying to solve natural disaster events through IoT technology. Due to forest fire accidents, the Australian continent has suffered lot last year. This incident is our motivation to develop this project. We have attached "smoke deductor" sensors in the forest randomly. All these sensors are connected through the global positioning system (GPS). You can monitor these sensors through your mobile also. If any fire accidents happen inside the forest, you can easily identify the location and take the necessary steps to escape from the accidents.*

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- [19] **Title of Paper: Tracking and Management of Fish Consumption in E-Portal**
Author(s): Jawaher Khalfan AL-Naabi, Jalila said AL-sarhani, Nasra Jaber ALwahabi,
Dr.Balasubramanian
Affiliation: Ibra College of Technology

Abstract: *This application has set of services for both user and admin. This application helps the fisherman to sell their fish easily and fast. Also it is clearly application for customer (Supermarket, souq and shops) to know about availability fish and easily to make order. Normally the customers want to purchase a fish in the Market or souq and the fish should be ready to consume. It is difficult for them to go to the market or souq and searching the particular fish with crowded environment. The time for travelling to the market and souq is inconvenient for the customers. But this application helpful for the customers to get a fish with their lace (Supermarket, souq and shops) by using E-portal transaction. Fishermen who want to sell their catch and fish online may register in online application portal. Customers can place their order after choosing the fish, from respective farmers or fishermen vendors by this application. The profit will be shared directly by the fishermen and farmers not allowing third person (agent) share their profits.*

- [20] **Title of Paper: Waste Management-An Innovative Idea to Reuse a Garbage to Energy**
Author(s): Iman Rashid Hamid AL-Butaini, Suresh GB
Affiliation: Ibra College of Technology

Abstract: Given the importance of garbage, developed countries have resorted to buying and producing energy from them, as plastic waste comes third after gas and crude oil in power plants. So I will perform a study solution to make the best use of them. My project is garbage container, This container create files for specific areas to know the amount of plastic waste they produce daily. Then it will send this data to a web page like location, capacity, waste type, weight and time. As that is allowing the government and environmental groups to effectively focus their resources and efforts in the area in curbing out or controlling the usage of plastic and the production, monitoring and disposal of plastic waste. Knowing this information daily will help control the increase in the amount of plastics, production, control and disposal of plastic waste, as well as awareness of the harmful effects of plastic use. This container will be used for studies and research on how to benefit from these plastic numbers, and how these numbers and quantity can contribute to raising the economy of Oman. Likewise, controlling and reducing altitude in these numbers, which may adversely affect the environment, the lives of people and living organisms. Researchers and those interested in environmental affairs will benefit from these statistics in conducting studies and research related to the environment and its future.

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