Introduction

The College of Computer Science and Information Technology (CCSIT) at Imam Abdulrahman Bin Faisal University (IAU) is one of the largest colleges in the University. Since its establishment in 2010, the College has been committed to provide its students with an innovative and state-of-the-art computer science curriculum that will enrich their knowledge and give them the experience they need to effectively contribute to the advancement of technology. Whereas the college aims and put great effort to provide outstanding graduation projects for the level 10 students, and it is keen to be in applied areas or community service as technology now is part of different areas applied, life and medical fields. Based on this principle, an exhibition is held annually for such projects. This booklet provides a brief introduction for these projects at the College. It includes 17 projects for Computer Science program (CS), 7 projects for Cyber Security program (CYS) and 19 projects for Computer Information Systems program (CIS) for both male and female sections.
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College Participations

International Conference on Computer and Information Science. 2019 ICCIS, Jouf, Saudi Arabia

the scientific poster competition in the second E-Learning Hackathon Event at Princess Nourah Bint Abdulrahman University

IEEE GCC Conference and Exhibition in Kuwait 2019

The International Conference on Cybersecurity is organized by College of Computer Science and Engineering, University of Hail.

5th Annual Conf. on Computational Science & Computational Intelligence (CSCI’18) | Dec 13-15, 2018 | Las Vegas, Nevada, USA
College Participations

Opcode conference: Dubai 19-20/4/2019

KAUST undergraduate ePoster Competition in Computer, Electrical and Mathematical Science and Engineering Division track (CEMSE)

“Al-Khair Es’hel” is a Community Service Development Project that aims to facilitate the work of charitable associations by providing technical solutions.

Welcome to ICCAIS’ 2019


Saudi International Exhibition & Conference for Internet of Things – Saudi IoT 13 - 15 Feb, Riyadh International Convention & Exhibition Center, Riyadh
# CS Projects Achievements

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| Anemeter: Noninvasive Point-Of-Care Technique For Measuring Hemoglobin Concentration | 2019 International Conference on Computer and Information Sciences (2019 ICCIS) Aljouf, Saudi Arabia  
The 11th Annual Conference on Undergraduate Research on Applied Computing (URC 2019), Zayed University, Dubai, UAE |
| Integration of 3D Virtual Reality in Diagnostic and Therapeutic of Cardiac Tumors | IEEE GCC Conference and Exhibition in Kuwait 2019  
The 11th Annual Conference on Undergraduate Research on Applied Computing (URC 2019), Zayed University, Dubai, UAE |
| Improving the Communication Skills for Children with Autism by Developing Virtual Reality Environment. | 1st place in poster competition (هادائد التعلم الإلكتروني) on 6 and 7 of March at Princess Nourah bint Abdulrahman University |
| Real-Time Sentiment Analysis on Arabic Tweets                                | The 11th Annual Conference on Undergraduate Research on Applied Computing (URC 2019), Zayed University, Dubai, UAE |
| Smart Monitoring of Water Tanks                                             | The 11th Annual Conference on Undergraduate Research on Applied Computing (URC 2019), Zayed University, Dubai, UAE |
| From 2D Medical Images to 3D Heart Model (CardioMulator System)             | The 11th Annual Conference on Undergraduate Research on Applied Computing (URC 2019), Zayed University, Dubai, UAE |
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# CIS Projects Achievements

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<td>The 11th Annual Conference on Undergraduate Research on Applied Computing (URC 2019), Zayed University, Dubai, UAE.</td>
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COMPUTER SCIENCE PROJECTS
Anemeter: Noninvasive Point-Of-Care Technique For Measuring Hemoglobin Concentration

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Brief Description
Anemia is the most widespread blood disorder in the population. It is caused due to a decrease in the level of Hemoglobin in the red blood cells. Anemia may result in body ache, fatigue, shortness of breath, and reduce individuals’ physical performance. Due to its negative impact on one’s development and performance; a Hemoglobin test may be required regularly to avoid significant risks, such as miscarriages. There are different methods to measure the Hemoglobin more or less invasive. Conventional
Hemoglobin tests involve blood drawing and it may cause an increased risk of infection in unhygienic conditions. Although the invasive method is reliable and accurate, it might be challenging, painful and requires visitation to a medical institution. Lately, multiple non-invasive Hemoglobin test methods have been developed to avoid such difficulties.

Our project aims to enhance the existing non-invasive methods to measure the Hemoglobin concentration in the blood via a smartphone Android application. An external customized circuit will be attached to the front camera of a Galaxy S6 Edge. The RGB values of the recorded video will be calculated and they will be fed to a machine learning model in order to predict the Hemoglobin concentration and identify the level of anemia if it is present. This proposed technique will be cost effective than other techniques and will cover a wide range of hemoglobin concentration.
Integration of 3D Virtual Reality in Diagnostic and Therapeutic of Cardiac Tumors

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Brief Description
Due to the complex nature of the cardio vascular system and rarity of the cardiac tumor in general, they are classified as one of the biggest challenges in the medical field. The cardiac tumors’ diagnostic tools include: Echocardiography and other imaging modalities such as: (Cardiac Magnetic resonance imaging (MRI), Cardiac Computed Tomography (CT)). The limitation to these tools, other than it being the only tools available to diagnose cardiac tumors, is that they are unable to differentiate
between tumors and other tissues. With that case, we aim to simplify the diagnosing process by introducing an integrated and automated system that can detect and highlight the tumor location. The input to the proposed system will be DICOM cardiac tumors images. The system will first apply preprocessing phase using various filtration mechanism to effectively distinguish between tumors and other tissues. After the pre-processing, the segmentation mechanism will be applied to extract the tumor. The segmented image will be converted to 3D model to allow the acquisition of full volumes, live 3-D images, and 3-D zoom to identify the size of the tumor in order to display the 3D model of the segmented cardiac tumor using Oculus Virtual Reality System. Our system aims to facilitate the cardiologist in diagnosis, surgical procedure and thereby increasing the successfulness of the treatment.

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**Client:**  
Community Service (Dhahran's Autism Center)

**Brief Description**

Children with autism spectrum and their families face many challenges on a daily basis. The most common challenges are difficulty of social communication, including lack of eye contact, responding to commands, etc. In addition, Resistance to change. For example, travelling represent a huge challenge to those children and their parents. It is very difficult to cope with the changes in their routine, crowds, new noises and sights. This difficulty adds more stress on their parents and families, and result in families limiting their travel plans. Therefore, the team has proposed a project idea which will
help the child with Autism Spectrum Disorder (ASD) to improve the communication skills by experiencing the virtual environment using VR headset. Such virtual environment would offer a safe and unfamiliar to the autistic child that might be unavailable in real life.

The project aims to contribute to the Arab society by developing a virtual airport that focuses on the communication skill in term of responding to command skill in the autistic child through a virtual reality experience. Moreover, the system provides 2D interfaces for specialist to manage the children’s information and track the progress history of the child.
Real-Time Sentiment Analysis on Arabic Tweets

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Brief Description
We have come to a time when the public’s opinion can be the opinion that matters the most. Many of the countries’ interior issues for instance are caused and driven by the strength of the public’s opinion. Hence, the need for a solution that gathers an overview and understanding of the public’s opinion is highly increasing. As the number of social networks increase, people are moving towards expressing their feelings and opinions using such large variety of social medias. As a consequence, it is becoming very challenging to gather the public’s opinion through traditional information gathering methods. Moreover, such large amount of data posted through social media represent
a very valuable source of information that if exploited can largely affect the decision making of individuals, organizations, and countries.

This research aims to apply real-time twitter sentiment analysis to report statistical views regarding the public’s opinion polarity distribution. In particular, we study the general opinions regarding the activities and events organized by General Authority for Entertainment (GEA). The proposed solution uses a Machine Learning approach to classify the tweets into positive, negative and unknown. This goal is achieved by implementing Multinomial Naïve Bayes, Support Vector Machine and Decision Tree classification algorithms. Nevertheless, this research implements some classifier optimization techniques by combining several classifiers to improve their performance. The outcomes of this research can assist decision makers in different sectors (currently the GEA) to identify the level of satisfaction of their targeted people and improve their performance respective.
Brief Description

Saudi Arabia has been classified by the United Nations as water-scarce country and a cubic meter of water supplied by a water tanker costs about 20 times more than water supplied through the network. This situation demands efficient use of water, especially water stored in the tank due to high cost associated. To address these problems, there is need for regular monitoring of water level to identify leakages quickly. Furthermore, occasionally oversighting of water level may lead to poor scheduling for refilling the tank.
In this work, we study existing solutions and develop an Android application based on the concept of the Internet of Things (IoT) for monitoring water levels of tanks in KSA. The proposed system helps monitoring water tanks in an effective way to avoid leakage or flood of water or not knowing how much water remains in the tank. The system uses wireless sensor to keep track of the water level and triggers an alert for the user if the water level is below a threshold level or empty. The concept of IoT helps continuously to keep track using sensors. The device (ultrasonic sensor) needs be attached to the water tank for monitoring and sending the data to the application through wireless link to keep track of its level. Using the android application, the user can disable and enable the notifications. However, when the tank is empty, the sensor sends a notification to the user and an email to the respective water company for refilling the water tank in a timely manner.
Brief Description

Analysts, researchers, and other users from different fields may spend a lot of time recognizing their work-related tasks and organizing them in a way that allows them to make the best use of their content. In this regard, we propose a Document Categorization Engine (DCE) that utilizes concepts of machine learning techniques and data mining. The project aims to develop a system that is capable of classifying documents based on user-defined criteria.
CLASSIFY YOUR DOCUMENTS WITH DOCUMENTS CATEGORIZATION ENGINE

OUR SERVICES

This smart engine provides many useful functionalities that you can deal with. To make you satisfied with such an experience of classifying as you were not before.

MULTI-FORMAT FILES
No need to spend more time on format compatibility. It accepts different file formats.

VIEW HISTORY
Now you can go back and easily navigate your previous classification history.

HIGH SPEED
You can finish your work in minutes instead of spending days on it.

CONFIDENT ACCURACY
You can be easy trust to work with it since it will irreach your confident level with its very small error rates.
Brief Description

Cardiovascular diseases (CVDs) are common diseases that result from heredity or influenced by one's lifestyle. To reduce CVDs, many studies using 3D modeling and simulation are conducted to understand, diagnose, and find treatments for the complex cardiovascular system. Especially now with the advances of the computer hardware which allows the execution of heavy computational software on most computers. To aid these studies, this project aims to develop an interactive 3D model of the cardiovascular system using 2D medical CT scans. The 3D model simulates the cardiovascular system and its mechanical functions and reflects the results on the 3D model. This project mainly involves three phases, segmentation, 3D modeling, and simulation. The segmentation phase produced the 3D heart meshes using ITK-Snap.
The heart objects, such as the aorta and ventricles, were segmented separately. Afterwards, the meshes were post-processed using Blender to lower the mesh vertices number, organize the meshes, and create the layer view and cross section view. Animation was also added to the objects using blender to visually aid the user on how the anatomy of the heart works. The system environment was developed in Unity3D Engine. It allows the user to enter the systolic-pressure, diastolic-pressure, stroke volume, age, and heart rate. Based on these inputs, the system will determine if the systolic-pressure, diastolic-pressure, and heart rate are normal or not. The system will also compute the cardiac output based on the heart rate and the stroke volume. Moreover, the entered heart rate is reflected on the model simulation.
Preemptive Diagnosis for Chronic Diseases

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Brief Description
The whole world is suffering from chronic diseases. It is wildly spread, and it is not easy to deal with the influence that these diseases cause. In the kingdom, some of the diseases have strong side effects which might cause the physical symptoms and family burdens, others might increase the patient rate of death than the general population increase. Therefore, the project focused on developing predictive systems to preemptively diagnose some chronic diseases, which include the Coronary Heart, Rheumatoid Arthritis, and Schizophrenia Diseases. The most crucial expected goal is
to know the possibilities of getting the chosen diseases or detecting them at an early stage to improve the health state in the Kingdom. The system models have been developed using machine learning techniques that include Support Vector Machine (SVM), Artificial Neural Network (ANN), Random Forest (RF), and Naïve Bayes (NB). The systems were built using real-life Saudi dataset taken from King Fahd University Hospital (KFUH), King Fahad Specialist Hospital (KFSH), and Al-Amal hospital. However, while waiting for the approval for real Saudi datasets we made use of available online datasets (CHD and Schizophrenia) for the initial models’ development and validation. It must be noted that the proposed techniques achieve better results compared to the earlier studies on the same online datasets. On getting the requested Saudi data the proposed models were retrained and validated to achieve the aim and objectives of the study. Experimental results indicated that the proposed models have the capability for effective and accurate preemptive diagnosis of the targeted chronic diseases.
Asset Manager System

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Brief Description
Asset Management monitor all asset lifecycles with workflows. It tracks the financial, contractual, and inventory details of hardware and devices, as well as non IT assets, throughout their lifecycles. Once an asset is deployed, the system records all maintenance activity and enable to perform regular audits, predictions, financial reporting and right up until asset retirement. Such systems are need for any type and any size of organization to keep track on the assets for financial and managerial look-up. The system is comprised of web as well as smartphone platforms to server the diverse need of modern-day computer interactions. The employees as well as administrators
can operate it under the privileges, they are preassigned. Charting, analysis and trend visualizations are few of the many features of the system.
Visualizing Time Series of Hierarchical Petroleum Wells by developing Dynamic Well View

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Brief Description
Oil reservoir simulation is one of the most advanced tools used by reservoir engineers to understand the fluid flow dynamics underground. Accordingly, the input of any simulation model consists of various and massive types of data sources. These include but not limited to static geological data resembling the reservoir structure as well as rock and fluid properties. A simulator embarks on this data to construct a discretized grid consisting of hundred of thousands or even millions of cells, thousands of wells,
hundreds of wells groups and decades of production data. Unfortunately, for massive simulation models, a simulator needs significant amount of time and computational resources to process the input, conduct simulation and generate the output. Therefore, any unintentional user error in the input files will lead to inaccurate output which may require repeating the simulation process again and consuming more time and resources. To avoid such a scenario, reservoir engineers spend long time reviewing the input files before feeding them to the simulator. Such a process is tedious, counterproductive and prone to human errors. Consequently, there is an ever increasing need for a visual analytics software that is capable of analyzing and visualizing input data, especially well data.
Internship Placement Web Application (IPWA)

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Brief Description

The internship enrollment process in “Health Information Management and Technology” department in Public Health College should be an easy process for all of those involved. However, the current process isn’t ideal, to say the least, Since the records are done manually which can cause a lot of human error and can cause some delays. To improve the efficiency and quality of the internship placement process. Computer technology was used to develop a web-based application that automates both the accepting and tracking of the student internship placement. Where it make
the communication between the related users more efficient. IPWA users are: Interns, Internship Affair Coordinator (IAC), College Vice-Dean for Training Affairs (CVTA), Hospital Coordinator, and Hospital Intern Supervisor (HIS). Hospital Coordinator will set his/her hospital requirements. After that, the Intern have four rotations and should register three options where he/she wants to take his/her internship at for each rotation. Next, the IAC will assign the student using an automated algorithm. The algorithm prioritize the student according to their GPA. If his/her options are available he/she will be assigned for it. Otherwise, the intern will be assigned to the nearest available hospital to his/her house. Then, the CVTA will sign all the placement letters that will be send to the hospital. The placement letter includes the intern information and the duration that the intern will take his internship with the hospital. Finally, the HIS could track his interns attendance, evaluate them, and review their reports. The IPWA is implemented using C#.NET, MySQL, and HTML.
Medical Transportation: MedPortation

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Brief Description

Hospitals need to transfer patients from one to another for many reasons. The main three reasons are as follows. First, the hospital doesn’t have enough beds to receive that case. Second, the case needs surgical intervention or magnetic imaging (MRI) that is not available in that hospital. Third, the case needs to treated at specialist hospitals rather than the current hospital. Generally, when one hospital needs to transfer a case to other hospital, they should transfer it with a doctor, nurse and the required information to the other hospital for receiving the case. This application is designed to facilitate the
referral process between two hospitals. By this application, the sender hospital can fill the information of the patient and send it to the receiver hospital to prepare the necessary procedures. So, it will help the two hospitals to communicate and prepare themselves before the referral process and allow the receiver hospital to track the ambulance car and check when the patient will arrive.
Brief Description

The project is an iOS mobile application that will implement indoor navigation and object identification. It is a collaboration project between College of Computer Science and Information Technology (CCSIT) at IAU, Sultan Bin Abdullaziz Science & Technology Center (Scitech) and Ms. Moneerah Almeshari, who is a PhD candidate at Computer Science Department (University College of London UCL). The application provides a different experience to the visitors to investigate their interest, manage their visits, find many ways to learn and entertain. It will provide services to the visitors.
to customize their own tour in scitech, to buy tickets online, to navigate in scitech without the need for a guide, and to identify the scientific object through the application. The users will have their tour history, a bookmarked object, event calendar and, information about the halls and Imax movies available at any time.
Automatic Channel Detection Using DNN on 2D Seismic Data

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Brief Description
Geologists aim at interpreting and estimating the earth’s subsurface properties using seismic data obtained through the process of reflection seismology. Channel geometry on seismic data is one of the most important properties being analyzed by huge gas companies to locate oil and natural gas deposits. Nevertheless, manual channel detection based on obtained seismic data is time-consuming and tiring. On the other hand, automatic channel detection techniques also take a hard blow due to the poor quality of data obtained. Latest and modern systems make use of real-time image processing for different tasks. It contains different processes like image analysis,
image enhancement and object detection. Channel detection on 2D seismic images is a combination of various mathematical methods in digital image processing that can identify streaks within images called channels that is very important to oil companies which when interpreted accurately can fetch millions or billions of barrels of oil and gas. This research-based project will implement a machine learning technique called Deep Neural Networks to identify channel patches in seismic data. The project also aims at developing a fully-fledged software based on the model created so that the experts can identify channels using a few clicks on the 2D seismic data that they want. It will make use of image processing techniques in combination with artificial intelligence to identify channels automatically which in turn will increase the efficiency of detecting geological discontinuities on seismic data.
Brief Description

LMS has become an essential tool in the industry of educational technologies. Learning Management Systems provide many features that help both students and instructors in their learning journey. Though a number of Learning Management Systems have been developed over the past years, the existing systems have some drawbacks. From this perspective, our proposed system which called “Baseera” is a new learning managements system. The name of the system “Baseera” is inspired from
an Arabic word that means strong vision, perception and understanding. Our system will cover most of the key features of existing Learning Management Systems, in top of that, it will enhance those features and add new ones.
Brief Description

LudoCode is an educational game to address the challenges and difficulties faced by students. This game is designed to be highly engaging, thus motivating and facilitating the students’ learning experience. It will provide an interactive environment where concepts are applied to a particular framework rather than a theoretical one. It will allow freshmen students to learn programming in a clear and interesting way. The project will play a great role in improving the programming skills of the students.
Question: Rearrange the code to print the robot name.

```cpp
#include <iostream>
using namespace std;

int main()
{
    1.
    2.
    3.
    return 0;
}

cout name;
string "jake";
<<name
name=
```
Brief Description

In the recent times, the power consumption and the huge bills has made everybody to think about power reduction. Though, there is an introduction of renewable power resources, but the available resources should be conserved and consumed optimally. Therefore, the wastage of power has to be managed in an efficient way. Moreover, there are many facilities in the campus requires power which can be controlled when it is not necessary. Like, the wasting electricity by leaving the power appliances without making
use of it in the evening. In order to provide a solution for this issue, the idea of Power Optimized Smart Campus has been proposed. As, it is going to provide a solution for this problem by having a smart model that detects the moving objects and turns the power supply on or off by the help of Deep Neural Network. In addition, this Deep Neural Network model is going to be supported by a dataset called as COCO dataset. This dataset is used commonly in object detection domain. Moreover, the dataset is trained by using a model called Caffe model, a powerful model in the field of object detection and recognition. This proposed idea is believed to get appreciation and help many to reduce the power consumption in domestic and commercial places.
CYBER SECURITY PROJECTS
Brief Description

With the increasing number of mobile phones and mobile applications, there is a noticeable raise in cybercrimes. Hence, an urgent need for mobile forensics has emerged. Before starting the investigation, the investigator should choose one of the acquisition types; physical acquisition, logical acquisition and manual acquisition. The current mobile acquisition tools use these methods to produce an image of the entire mobile content, files of specific datatypes or data of a certain application. Unfortunately, the resultant output does not facilitate investigating cases related to specific mobile application, since the tool might acquire more than what is needed which requires investigators to filter data manually or acquire all the application’s data.
without sufficient analysis. This research designed a forensic tool that extracts WhatsApp data in a forensically sound manner while preserving efficiency, reliability, maintainability and providing easy to use interfaces. The research presented a comparative study on the existing WhatsApp Forensics Tools based on two aspects; NIST Mobile Device Tool Test Assertions and researchers’ requirements. The results of the comparative study showed a shortage in the current WhatsApp Forensics Tools as they do not satisfy all NIST Test Assertions nor all researchers’ criteria. Additionally, the current tools use either rooting or downgrading to extract the encryption key to decrypt WhatsApp acquired data, which both proved ineffective. The results of both comparative aspects emphasized the need of developing a comprehensive WhatsApp forensic tool, which is the major objective of this paper. The proposed tool compensates the shortcomings existed in the current WhatsApp forensics tools, provides new method to extract the encryption key and accelerates the investigation process of cases that concern WhatsApp application only.
**Touchless Quick Access: A Continuous Face Authenticator**

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**Brief Description**

The project aim to design a web-game that can be used to collect data on human beTouchless Quick Access system proposes a new well configured, high-level, and a web-based user identification approach that depends on continuous live remote facial recognition. Moreover, this system depends on the idea of creating a live remote user recognition and access provision scheme that will act as a protection shield against various and advanced attacks to ensure that highly valued system resources are being
safeguarded and protected, and users are being reassured and asserted. In addition, to ensure continuous verification, the system will do the verification process every few seconds without disrupting the user while he is using the system resources as shown in Figure 1 below.

Figure 1: Touchless Quick Access structure.

The Detection process and saving the results in the database

The recognition of the live user
SafeZone “Detecting and Preventing Drones’ Misuse”

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Brief Description
This project aims to detect and prevent drones from invading the privacy of restricted areas of small to medium sized entities. There are five main categories of existing detection methods, namely: detection using sound, computer vision, radar, Hologarde and ambient RF signals. Until now, none of the solutions have met the optimal requirements of detection which are cost-effectiveness, accuracy, long range, convenience, unaffected by noise and generalization. In terms of prevention, the existing methods were focusing on practical and impractical solutions, where both had limitations. According to our analysis of previous related works, none of the solutions included detection and prevention at the same-time while meeting the previously
specified requirements. The proposed solution is based on the combination of detection and prevention methods, where a passive radar and radio frequency sensors will be joined to detect and prevent drones from accessing others’ property. The passive radar will have the ability to detect and identify a drone, where a notification message would be sent to the pilot and property’s owner. The entity’s database would be populated each time a drone has crossed the yellow zone area. Moreover, the centralized system has the ability to manage and configure sensors, and report to the entity’s owner in addition to, the government. Prevention techniques would be applied through sending jamming signals and forceful safe landing of the drone. We believe that the proposed design will assist in limiting drones from violating privacy of restricted areas in order to accelerate the drones’ application and development.
Quantum Cryptography on IBM QX

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**Brief Description**

With the innovation of quantum computers that depend on quantum physics, the classical cryptographic algorithms such as RSA will be easily breakable in a few seconds by the high computational power of quantum computers. Therefore, to be protected from the power of the quantum computer, a quantum computer must be used. This project focuses on testing the applicability of current quantum computers to cryptography by implementing two areas of quantum cryptographic protocols which are the Quantum Key Distribution (QKD) BB84 and Quantum Bit Commitment (QBC) on IBM’s Quantum processor, and provides statistical analyses of them. The statistics show and prove the merit and effectiveness of those cryptographic applications. Those
two protocols utilize the features of quantum and physics that can generate a state of 0 and 1 at the same time by superposition feature, in addition, to the Non-clonability feature that prevents eavesdroppers from copying the transferred quantum bits on the channel. By utilizing these features BB84 protocol will be able to generate and share cryptographic keys through the quantum channel without giving chance to the eavesdroppers to understand the communication with a high chance to detect eavesdropping attempt. In the other hand, QBC protocol will provides a verifiable honest between two mistrustful parties. With those protocols, the three main security requirements will be meted which are confidentiality, integrity and non-repudiation ability.
Brief Description

Although the IoT evolution led to quality of life enhancement, many of its devices are insecure. The aim of this project is to develop and simulate a protocol that authenticates industrial IoT devices with an efficient key management mechanism. Authenblue has four main phases, inception, association, authentication, and authenticated encryption/decryption. The protocol is simulated with NS3 simulator. Ultimately, through this protocol, many current attacks that utilize the lack of identity authentication systems in IIoT are hindered, and as a result, the overall security is enhanced.
Inception
The TC firstly generates unique identifiers and initial keys to be set at the CPANs and IIoT devices by the administrator.

Association Req/Res
An IIoT device requests a CPAN for an association and the CPAN replies after it authenticates the device.

Authentication Req/Res
Has to be done by both, the IIoT device and the CPAN to associate successfully.

Authenticated Enc/Dec
Encrypting/decrypting the unicast and broadcast messages using AES-128/256.

Migration
Using a blockchain that is accessed by CPANs to migrate IIoT devices from a cluster to another easily.
Masfan Phishing Simulator

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Brief Description
The organizations’ interest in training employees against phishing campaigns coincides with the increase in phishing attacks. In this aspect, one of the training techniques is phishing simulation tools. The contribution of this project is to assist organizations of different sizes and types to counter “email phishing” attacks by developing a tool called Masfan. The application will enable administrators to simulate phishing emails for testing employees’ awareness level. After testing campaigns,
feedback will be delivered to users to let them know whether they would be a victim of email phishing or not. Also, Masfan will point out email phishing characteristics that should be paid attention to by users.
DoS detection in Web Environment using WEBPOT

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Brief Description

Detecting attacks is one of the concerns for any organization since traditional detection techniques are not effective and had limitations. There are different attacks that affect organization security, one of these attacks are DoS attack. In such an attack, the attackers can deny organization services from legitimate users without needs to gather much information about the organization except the IP address or the URL of the website. These attacks cause big losses and affect the security posture of the organization. The honeypot is a good security solution, it can monitor attacks by attracting the attackers to interact with services, capture traffics, detect attacks and analyze attack behavior to develop detection mechanism. This project proposes
a honeypot web server (WEBPOT) that emulates two services which are FTP and telnet. This WEBPOT implemented on Ubuntu server operating system and use Nginx web server along with PHP, and MySQL to provides web service. It monitors and logs web traffic to detect DoS attack that targets WEBPOT using python code and specify the malicious IPs and enables further analysis.
COMPUTER INFORMATION SYSTEMS PROJECTS
Automated Supervision for Dental Colleges Students

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Eman Almubarak

Brief Description
Currently, the importance of using technology in healthcare has been increased to improve work productivity since it saves time, effort and cost. A mobile application that facilities communication between students and supervisors of College of Dentistry (COD) at Imam Abdulrahman bin Faisal University (IAU) has been developed. It allows the students to send notifications to the supervisor asking for intervention while working in the clinic. The system functionalities include assigning supervisor-student course, group communication between the students and their supervisors and producing reports about emergency cases. The group communication is provided using live chat with limited characters between students and their supervisor. The students can
send requests to their supervisors. These requests could be asking for consultation, need of urgent emergency treatment, or exam. Then, the supervisor receives notifications about the requests and prioritizes them based on their importance. The application is deployed with the most suitable technologies such as QR Code that helps the
Smart Learning Environment for Autistic Kids (SLEAK)

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Achievements:

Brief Description
With the course of time, the use of technology has played a prominent role in research and several clinical practices. In this work we consider the use of technologies to deal with users suffering from Autism Spectrum Disorders (ASD). Autism spectrum disorders (ASD) is defined as a deep deficit in social communication and interaction skills as well as restricted range of interests and activities. The ultimate consequence is that children with autism do not have the opportunity to access learning that children in the comparator groups share.
Assuming that Autism is usually associated with intellectual disabilities, educating autistic kids is a ‘herculean’ task, however learning is mandatory and crucial requirement for their involvement in the society. Our project consists of designing, developing and testing a smart ubiquitous learning environment for autistic kids. The SLEAK system is a responsive online user-centered e-learning system for supporting the educational program adopted by specialized autism center. It is aimed at teaching different skills related to main identified autism deficits such as help kids to learn about their daily tasks and raise their risk awareness. Also, it provides a personalized interactive experience improving the user engagement throughout different techniques and methods such as rewarding, assistance and gamification.
Classroom Connect

Brief Description

Classroom-Connect is a hybrid mobile application intended to be used by the students, instructors, and scheduling unit of College of Computer Science and Information Technology (CCSIT). The aim of this project is to solve the problem of the lack of interactivity and communication between students and their instructors as well as the pressure overload on class leaders where they have to act as the link between students and instructors.

This hybrid mobile application contains many needed functionalities that act as a valuable and handy tool to simplify and strengthen the communication and interaction processes which are built to accommodate CCSIT students and instructors’ needs.
Interactive game-based learning has become one of the promising technologies out there. Earlier with the improvement of digital technology in the world, the learning process has seen a huge change.

This project intended to offer innovative modern technology to speed up gaining primary knowledge by learners from Arabic kids’ generation. Effort provided include the development of three Arabic interactive educational games (AIED), Match Map Geography, Math Calculations, Letters & Words, combined to create an environment of enjoyable learning opportunities. The unique features associated are the ability to
monitor kids intellectual progress by using game analytics, originate an Arabic game that is first of its kind in the market, and create free interactive games integrated with fun educational sound effects, attractive animations, score-based rewards that serves usability. The project has demonstrated that it is possible to use and apply latest technologies to provide the necessary development in order to elevate the necessary knowledge of kids’ educational levels.
Road Roughness Management System

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Brief Description

Road Roughness Management System (RRMS) is a proposed solution to the Ministry of Transport, it aims to assist the Ministry of Transport by providing them with an automated solution that will drastically reduce the time required for gathering, transmitting, and synchronizing the roughness data of the expressways around the kingdom. Also, it will assist in automating the process of monitoring and reporting road conditions between the MoT’s managers and their respective contractors. In addition, the process of inspecting the roads will be conducted more often which will contribute in increasing the accuracy of data, hence, a maintenance can take place before any serious damage happens. In addition to the report generation feature, that allows both the managers and contractors managers to generate reports based on selected factors. The solution is composed of a web-based system and an Android mobile application,
that will utilize an existing mobile application that uses the sensors integrated within the smartphones to collect the vibrations data to measure the road surface roughness. The collected readings will then be exported from the mobile phone to the MoT’s centralized server. There, the data will be analyzed and represented in the website through a map that uses different colors to reflect the roads’ conditions according to the International Roughness Index (IRI). Another feature of the system involves adding tag on the map to address any issue on the road and submit it to the central server where the MoT’s managers can view it and take actions accordingly.
JASAD Revival System

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Brief Description

JASAD revival system is a web-based system that implemented to a non-profit institution (JASAD institution). This system contains all the institution department which includes human resource, project management, accounting department. The JASAD revival system helps the employee and managers to achieve their work in an efficient way with less time-consuming. This system is developed as a community service.
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<td>التخطيط</td>
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<tr>
<td>Jack</td>
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Brief Description

ArabaTech is a smart wheelchair that provides the elderly with electric movement and safety features along with smart home environment data that helps protect the user of the wheelchair. The main safety features of ArabaTech are obstacle avoidance and line tracking. The wheelchair will also be able to receive smart home data and respond to unusual situations such as a very high temperature or the existence of smoke.
The location of the wheelchair:

Temperature: The temperature is normal
Smoke: No smoke detected
Door: The door is open
Lights: The lights are OFF
AC: The AC is ON
Blood Pressure: The blood pressure is low!
Body Temperature: The body temperature is fine
Pulse Rate: The pulse rate is normal
Windows: The windows are open
Humidity: Regular humidity
Circular CV

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Brief Description

The purpose of this project is to assist especially students and faculties on how to maintain their Curriculum vitae in daily busy life. Currently, people build Curriculum vitae at the time of applying jobs or if a need arise. Unfortunately, loosing track record of important career achievements, events, seminars, volunteering work, certifications, and other professional career related means they are hard to be remembered. Secondly, maintaining our Curriculum vitae should be part of our daily life and need to be kept updated all the time. Hence, we propose user friendly mobile app which will act as a
mediator between the user and the user curriculum vitae to help maintain his curriculum vitae automatically. The core functionalities of our project would be to integrate with Email server to track events, add push notification services to have user experience updated based on calendar events, generate auto curriculum vitae in English and Arabic language for non-Arabic speakers, and maintain track record of user achieve
Brief Description

Tourist travellers most likely will suffer from lack of information regarding different destinations and points of interest when surfing the internet. The information that traveller will get from surfing the internet will probably be inaccurate or insufficient and the travellers could face too much distractions from the internet. In addition, the traveller could suffer from lack of information on the go.

Traveller Planet mobile application aims to design and develop a mobile application for travellers. This application will focus on (Exploring, Planning, Experiencing and Sharing) of trips, which will help the traveler make the choice of the places he or she
wants to visit after reviewing different rating and reviews of other peoples or simply by viewing their trip plans and pictures. After that, traveller can put these places in the wish list and start formulating his plan in a calendar with all check-in and check-out dates. Then, during traveling time the application will provide him with information on the go and send him a notification encouraging him to document his trip by taking pictures and publish it through the application. And by all this functionality the application is able to provide a comprehensive traveling experience from exploring, planning, then experience and sharing. Traveller planet developed in android platform to provide flexibility and support many features, and it can be one of the most user friendly and famous applications.
“Made with passion” aims to employ the power of data analytics to support productive families. The project is a mobile application which will be deployed under the supervision of “Wud” charity. The productive families registered with charity will be able to electronically exhibit their product. A dashboard for each family will be embedded in the App, it will accessible by the families, the charity and eventually by the customers under the acceptance of the family. The dashboard will show the performance of the family in terms of popular products, sales, …etc.
Voicy Mouse Application

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**Brief Description**
Voicy Mouse project falls under Human-Computer Interaction (HCI) umbrella, which uses speech recognition technologies. Voicy Mouse is a desktop application that controls the mouse’s cursor by voice over a user-friendly interface. Mouse Grid interface is a three-by-three grid with the sections numbered one through nine, allows the user to move the mouse cursor to a specific area. The application serves all kinds of computer users and especially people with physical disabilities in the upper limbs.
The main feature that gives the importance of the application is supporting Arabic in addition to the English language. Also, it provides Personalize feature to give the ability to the user to record specific commands for controlling the application.
Tasharok Mobile Application

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Brief Description

Today’s market is oversaturated and becoming more competitive every day. Which drives job sectors and organizations to become more demanding of their employees. One method to combat this is knowledge sharing, where people seek out knowledge and contribute with others to share it. The development team intend to develop a mobile application that facilitate the people with the knowledge and encourage them to share it with others who will benefit from it.
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Brief Description
We all have a natural desire to help others, but we may not always have the time or medium to go to a charity and donate. Even if we had the time, some may think that their small donations would be useless. No matter how small the amount you donate, it does make a huge difference. Imagine if you had the option to donate in a simple way, you will save a home, and this will help you have a great feeling of achievement and gain that fulfilling feeling.
Ehsan offers the ability to donate your unwanted items such as clothes, furniture, electronic devices, and dry food. You can also donate money through the app or add an invoice of a transaction. With every donation made you will receive points that can add up to your advantage. On the other hand, the admin is responsible for managing the donations requests, events and more. Thus, Ehsan handles both the admin and donor at ease.
**AlHussaini OP**

**Brief Description**

AlHussaini OP is an application designed and developed to automate AlHussaini charity’s operating plan. The application will help the charity’s managers and employees in managing and updating the operating plans along with storing the information in a secure database. Moreover, the application includes many supporting functions for example, generating graphs and reports based on the giving data, the managers can oversee the employees work progress and the admin can change the privileges or authorities for employees.
IAUBOT

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**Brief Description**

IAUBot is a chat bot developed and deployed inside the university servers.

This service helps the visitors by providing them direct link or answers related to the university website by using basic NLP methods and also the program learns from user input to classify the request to be useful and related or it’s a general question by using a probabilistic ML algorithm.

It also facilitates some functionalities for the student (e.g. retrieve attendance percentage) and the faculty members to update some information related to their courses (e.g. update announcement).
All that with the ability to record almost every operation it does, so that the technical support can use the service to make it generate excel and csv files that contain information about what and how IAUBOT has done what its doing right now, and these results and records may lead to a prediction analysis. (the service generate these files by itself with organized formatting).
**Brief Description**

This application moves Eta’am form being reactive to being proactive, the mobile application will facilitate to Eta’am their vision about spread awareness between society members and educate them to not use food more than need and waste it.

There are four users of Lazzem application:

Host: host can send invitations via social media, select time, date and location of the event and view list of offers from the food providers and select one of them.

Food provider: the food provider will provide offers and discount to the host to
prepare the food for the event and confirm order requests from host.

Admin: the admin will manage the application.

Guest: the invitation will be sent as a link to the guest and they can accept or reject the invitation.
Brief Description

Nowadays the need of technology in many work fields has increased especially for the activities that are performed every day. Technology plays an essential role in eliminating the challenges that are faced when performing the work manually. For the traditional recruitment process, the nature of executing the work have to be done manually starting from announcing the job offers and ending up with recruiting the candidate. In fact, the challenges of the traditional recruiting process become greater as it requires to collect and analyze thousands of jobseekers’ information.

As Imam Abdulrahman bin Faisal University (IAU) is facing the difficulties of the
traditional recruitment process, I-Recruitment project aims to resolve these difficulties which are encountered by the hiring staff and the jobseekers. I-Recruitment is a web-based portal system that based on offering job opportunities and finding the best qualified candidate for the jobs in a timely manner. Moreover, it streamlines the work for both the jobseekers and the IAU hiring staff by integrating all the recruitment activities in one place including the job offers announcement, job application in addition to candidates’ interview.
The Expert System to Diagnose Problem in Industrial Waste Water Treatment

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Brief Description
IE-Consult wants to develop an expert system that can help and guide operators to solve the operational problems of the plant. The expected system shall replace the manuals and the need for an expert to solve the problems.
Waste Water

Welcome In Expert System To Diagnose Problems

In Industrial Wastewater Treatment

Start
Brief Description

The purpose of this project is to develop a mobile application and a web-based system for patients who suffer from chronic kidney disease (CKD). The application will capture the patients’ behavior and will help health provider at the hospital to observe those behaviors. Also, I-CARE will help the patient to control and manage their diet, medicines and appointments. The website will be used by the health provider who will monitor and observe those patients’ behaviors to give them instructions remotely.
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  Dr. Khalid Alissa
  Dr. Mohammed Gollapalli
  Dr. Mohammed Basheer
  Dr. Nesrine Mezhoudi
  Ms. Norah AlMubairik
  Mrs. Mashael Alkadi
  Ms. Fatimah AlShamrani

Organizing Committee:
  Dr. Ahlam AlArfaj
  Dr. May Aldossary
  Mrs. Faiha Bin Rubiaan
  Mrs. Latifah Alhemli

Designed By
  Dr. Alaa Alahmadi
  Ms. Mona Altassan
  Mr. Hussain Alattas
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<td>community engagements</td>
<td>Community Partnership</td>
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<td>Commitment</td>
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