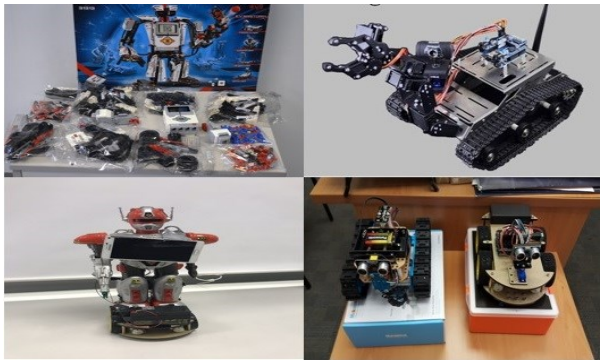
PRINCE MOHAMMAD BIN FAHD UNIVERSITY
College of Computer Engineering and Science

CCES NEWS

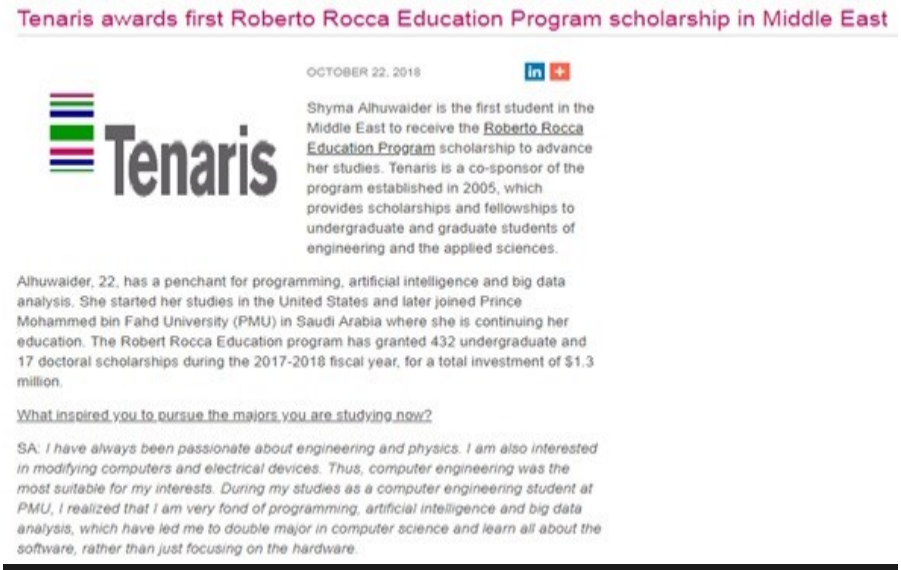
College of Computer Engineering and Science Newsletter | Issue 1 | January 2019

CCES Faculty meeting with students to discuss about senior design project ideas

The college held a senior design kick off meeting sessions on January 17th and 21st 2019 in the female and male side, respectively. The meeting took place in the senior project reserved labs. Faculty discussed with students about the different topics that they could work on as well as available hardware that the college provides to CCES students. More than 40 students showed up in these sessions. Students had the chance to present their own ideas and have discussed with faculty the high level details of current project topics. Most of the students expressed their desire in working in area related to Machine Learning, Arduino-based Robots, Cryptography, Parallel game programming, developing mobile app, building E-commerce type of application. The meeting culminated in having 80% of the students pretty much decided about their project topic and their immediate advisor.



In This Issue



Tenaris awards first Roberto Rocca Education Program scholarship in Middle East

OCTOBER 22, 2018

Tenaris

Shyma Alhuwaider is the first student in the Middle East to receive the Roberto Rocca Education Program scholarship to advance her studies. Tenaris is a co-sponsor of the program established in 2005, which provides scholarships and fellowships to undergraduate and graduate students of engineering and the applied sciences.

Alhuwaider, 22, has a penchant for programming, artificial intelligence and big data analysis. She started her studies in the United States and later joined Prince Mohammed bin Fahd University (PMU) in Saudi Arabia where she is continuing her education. The Robert Rocca Education program has granted 432 undergraduate and 17 doctoral scholarships during the 2017-2018 fiscal year, for a total investment of $1.3 million.

What inspired you to pursue the majors you are studying now?

SA: *I have always been passionate about engineering and physics. I am also interested in modifying computers and electrical devices. Thus, computer engineering was the most suitable for my interests. During my studies as a computer engineering student at PMU, I realized that I am very fond of programming, artificial intelligence and big data analysis, which have led me to double major in computer science and learn all about the software, rather than just focusing on the hardware.*

PMU students attended the "2nd Saudi Aramco Cybersecurity Technical Exchange Conference"

35 CCES students were invited to attend the 2nd Saudi Aramco Cybersecurity Technical Exchange Conference which took place in ARAMCO on 29th, 30th of October 2018. The event included multiple technical workshops sessions in topics related to Cybersecurity such as Hunting Digital Artifacts, Social Media Hacking, Using AI to Automate Threats Hunting, 2018

major security breaches, The Impact of artificial intelligence on cyber security, IT and OT convergence in the world of Cyber security, etc. these sessions were delivered by speakers working for top security companies such as Kaspersky, Macafee, Symantec, Proofpoint, Fortinet, SecurityMatters, and Vectra. CCES students reported that attending the conference was very beneficial since they were given the chance enhance their technical skills in the area of security through these technical sessions given by subject matter experts (SMEs').

PMU student "Ms. Shayma Alhuwaider" awarded Roberto Rocca Education Program scholarship

Ms. Shyma Alhuwaider from the College of Engineering and Science is the first student in the Middle East to receive the Roberto Rocca Education Program scholarship to advance her studies. Tenaris is a co-sponsor of the program established in 2005, which provides scholarships and fellowships to undergraduate and graduate students of engineering and the applied sciences. Ms. Alhuwaider, 22, has a penchant for programming, artificial intelligence and big data analysis. She started her studies in the United States and later joined Prince Mohammed bin Fahd University (PMU) in Saudi Arabia where she is continuing her education. The Robert Rocca Education program has granted 432 undergraduate and 17 doctoral scholarships during the 2017-2018 fiscal year, for a total investment of $1.3 million.

Full interview with Ms. Shayma is in the below link.

http://www.tenaris.com/en/MediaAndPublications/News/2018/Oct/Rocca-SaudiArabia.aspx

Group of PMU students won the 4th place in the Wa'ed Hackathon competition organized by Saudi Aramco Entrepreneurship Centre

A group of PMU students from the College of Computer Engineering and Science (CCES) and with the support of PMU Creativity and Entrepreneurship center have participated in a competition sponsored by Saudi Aramco Entrepreneurship Centre (Wa'ed Hackathon) which took place from November 29th until December 1st in the Dhahran Techno Valley. The goal of this competition is to provide young Saudi students, innovators, developers and entrepreneurs the opportunity to tackle real world, everyday problems through innovative solutions. Our CCES students took part of the "Recreation Activity" challenge where they designed an application to help users identify touristic activities in the Kingdom. Our students demonstrated a strong command of both: technical and soft skills; and were able to clinch the 4th position after an outstanding performance. The participating students are: Saud Bubshait, Marwan Rafie, Saeed Al Ghamdi, Meshal Alnazi, and Abdullah Al Hamad.

OFFICE OF ENRICHMENT PROGRAMS

Photo Caption

Top CCES students participated to the Winter Enrichment Program at KAUST

About 40 of our top CCES students were invited to attend the Winter Enrichment Program on January 16th, 2019 held in King Abdullah University of Technology and Science. The event was chaired by Professor Valerio Orlando, Head of Environmental Epigenetic Program. The WEP2019 featured 12 days of keynotes, lectures, discussions, master-classes, exhibits, and cultural events all relating to the theme of TIME. KAUST offered a tour to all students and exposed them to existing labs and high technology facility. This event was a good opportunity for our PMU students to learn from well-known speakers about the theme of TIME, and more important to get introduced to KAUST, a potential destination for our students where they can pursue graduate studies.

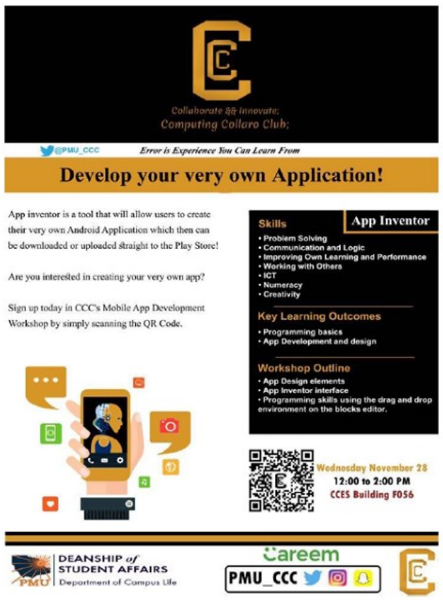
PMU students winning the 4th place

CCES offering a presentation about Python programming language

Part of the activities and support that the CCES college is continuously offering to students and in the efforts of helping students staying on top of the cutting edge of the technology and keep up with the market needs, the college offered a session/workshop in Python programming language, by CCES Lab Instructor Ms. Roxane. Python is a widely used general-purpose, high level programming language which was launched in the early nineties and developed by Python Software Foundation. It was mainly developed for emphasis on code readability, and its syntax allows programmers to express concepts in fewer lines of code. Python is widely popular for Artificial Intelligence and Machine Learning problems. The event took place on November 12th, 2018 and was very successful. 28 CCES students attended the event and were issued certificates of attendance. Due to the overwhelming number of requests to offer a Python hands on sessions, the college is planning for follow-up events in the Spring semester.

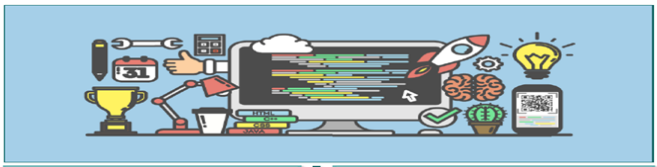
Develop your own Mobile App Development Workshop by CCES

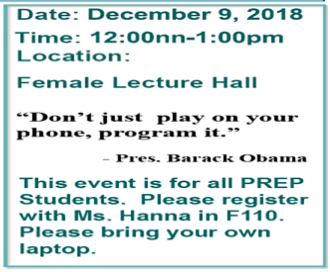
Mobile App Development workshop took place on Wednesday, December 28, 2018 and was presented by CCES Lab Instructor Mr. Zikria. The workshop covered the topic of Mobile App Development which basically gave students a clear and simple idea on how to create their own unique applications. The Workshop focused on having students utilize a tool called App Inventor which allows users to create their very own applications then be able to download them or upload them directly to the play store. The workshop was conducted by College of Computer Engineering and Sciences with the help and coordination of Computing Collaro Club (CCC) which oversaw organizing, marketing and managing the workshop. The workshop was a great success and the students' survey data showed a high level of satisfaction with the content that was provided in the workshop and would like to see more of similar



Hour of code Programming workshop by CCES

Dr. Yasmeen from CCES organized the “Hour of code” event in the female side on December 9th, 2018 to mainly bring awareness to young students about the importance to computer programming as well as to introduce our female prep students to Computer Science and show them how fun it is to be a programmer. This event is a worldwide event that celebrates Computer Science. It takes place every year during Computer Science Education week Dec 3-9 and lasts for only one hour. The Hour of code PMU can be a good advertisement that will encourage students to join the CCES College. Such event is also expected to motivate current students by showing them how their major can be enjoyable. More details about this event is available in this link https://hourofcode.com/us . This event will help PMU name be added to the map in the website. Students who successfully completed the tutorial have received a certificate provided by the Hour of code website.



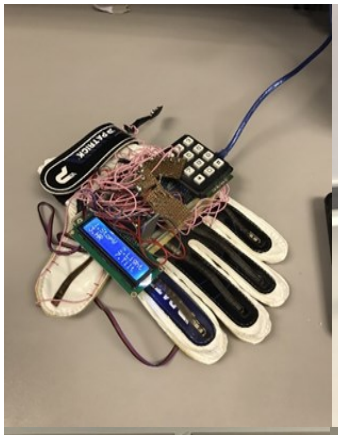


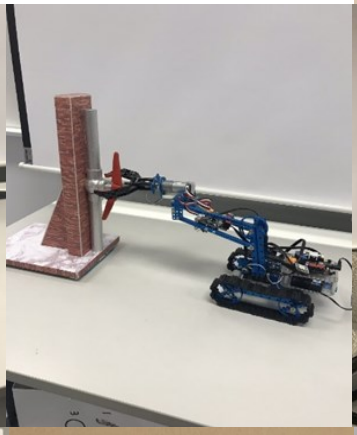
Ms. Danyah – CE student offered a seminar about Cybersecurity to PMU female community

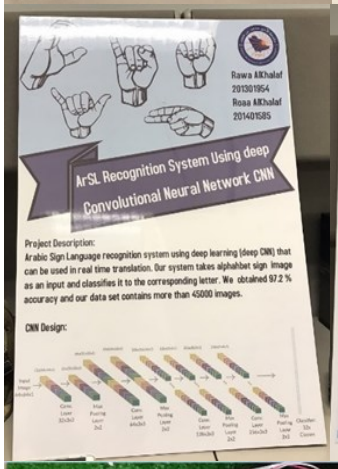
Student Danyah form the Computer Engineering department organized a seminar session with the help of the college. The goal of this seminar is to spread awareness about the phishing attack that happens via the internet and as a result could cause harm to many people in terms of their personal information and money threatening. The seminar was held on October 16th, 2018 and took place in the lecture hall and attracted a large number of audience.

CCES Female students held a Senior design project exhibition day

The CCES female students organized the regular end of the Fall semester exhibition about students' senior design projects in the CCES Cisco Lab. The event is a good opportunity for students to present the fruit of two semesters worth of work in a various projects where they worked in groups and had to demonstrate their ability to put together the skills they acquired at PMU over a 4 years period. These skills included all PMU competencies including technical problem solving, writing, communication, leaderships and professionalism. The event was a good opportunity for junior students to get exposed to what they will be able to deliver in the near future as well a good opportunity to advertise for the College of Computer Engineering and Science.







PMU launching a new Bachelor of Science in Software Engineering

The College of Computer Engineering and Science is starting a new Bachelor of Science in Software Engineering. The program was designed by the Texas International Education Consortium (TIEC) and ensures its compliance with the current standards of U.S. and international accrediting bodies as well as the needs of students at PMU and in the Kingdom. It is expected that this degree program will provide appropriate professional preparation for students working toward careers in software development and will also offer excellent preparation for students intending to study at the advanced degree level.

BACHELOR OF SCIENCE IN SOFTWARE ENGINEERING

PREPARATORY YEAR

FIRST SEMESTER – Beginners			SECOND SEMESTER – Intermediate			THIRD SEMESTER – Advanced		
Course Number	Course Title	Contact Hours	Course Number	Course Title	Contact Hours	Course Number	Course Title	Contact Hours
PRPE 0021	Beginner Enhanced Learning	15	PRPW 0041	Intermediate Writing Skills	10	PRPW 0061	Advanced Writing Skills	10
			PRPC 0041	Intermediate Comm. Skills	10	PRPC 0061	Advanced Comm. Skills	10
PRPC 0021	Beginning Comm. Skills	10	PRPI 0041	Intermediate Enhanced Learning	1	PRPA 0061	Advanced Enhanced Learning	1
			PRPT 0041	TOEFL Prep. I	2	PRPT 0061	TOEFL Prep. II	2
PRPW 0021	Beginning Writing Skills	10	PRPL 0011	Theories & App. of Learning I	2	PRPL 0012	Theories & App. of Learning II	2
			PRPM 0011	Introductory Algebra	5	PRPM 0022	Pre-Calculus	5
Total Contact Hours		**35**	**Total Contact Hours**		**30**	**Total Contact Hours**		**30**

FRESHMAN YEAR

FIRST SEMESTER				SECOND SEMESTER			
Course Number	Course Title	Credit Hours	Pre-requisite	Course Number	Course Title	Credit Hours	Pre-requisite
ALIS 1211	Arabic / Islamic Studies	2		ALIS 1212	Arabic / Islamic Studies	2	ALIS 1211
COMM 1311	Written Communication	3		COMM 1312	Writing and Research	3	COMM 1311
UNIV 1211	Prof. Development and Competencies	2		UNIV 1212	Critical Thinking and Problem Solving	2	UNIV 1211
MATH 1422	Calculus I	4	PRPM 0022	PHYS 1421	Physics for Engineers I	4	PRPM0022
GEIT 1411	Computer Science I	4		GEIT 1412	Computer Science II	4	GEIT 1411
PHED 1111	Physical Education I	1		MATH 1423	Calculus II	4	MATH 1422
Total Credit Hours		**16**		**Total Credit Hours**		**19**	

SOPHOMORE YEAR

FIRST SEMESTER				SECOND SEMESTER			
Course Number	Course Title	Credit Hours	Pre-requisite	Course Number	Course Title	Credit Hours	Pre-requisite
ALIS 2211	Arabic / Islamic Studies	2	ALIS 1212	ALIS 2212	Arabic / Islamic Studies	2	ALIS 2211
UNIV 1213	Leadership and Teamwork	2	UNIV 1212	COMM 2312	Technical and Professional Communications	3	COMM 1312 COMM 2311
PHYS 1422	Physics for Engineers II	4	PHYS 1421 MATH 1422	ASSE 2111	Learning Outcome Assessment I	1	
MATH 1324	Calculus III	3	MATH 1423	GEIT 2331	Mathematical Reasoning and Algorithmic Thinking	3	GEIT 1412
GEIT 2421	Data Structures	4	GEIT 1412	SOEN 2312	Web Programming	3	GEIT 1411
COMM 2311	Oral Communication	3		GEIT 2291	Professional Ethics	2	
PHED 1112	Physical Education II	1	PHED 1111		Social Science Elective I*	3	
Total Credit Hours		**19**		**Total Credit Hours**		**17**	

JUNIOR YEAR

FIRST SEMESTER				SECOND SEMESTER			
Course Number	Course Title	Credit Hours	Pre-requisite	Course Number	Course Title	Credit Hours	Pre-requisite
GEIT 3341	Database I	3	GEIT 1412	SOEN 3311	Requirements Engineering	3	GEIT 3351
GEIT 3331	Computer Organization	3	GEIT 2421	SOEN 4361	Operating Systems	3	GEIT 3331
SOEN 2332	Discrete Structure and Combinatorial Analysis	3	GEIT 2331	ASSE 3211	Learning Outcome Assessment II	2	ASSE 2111
GEIT 3361	Principles of Software Engineering	3	GEIT 1412	SOEN 4371	E-Commerce	3	GEIT 3341 SOEN2312
SOEN 3351	Algorithms I	3	GEIT 2421	MATH 2313	Probability and Statistics	3	MATH 1423
Total Credit Hours		**15**		**Total Credit Hours**		**14**	

SUMMER OF JUNIOR YEAR

Course Number	Course Title	Credit Hours		Pre-requisite
GEIT 4361	Internship	3	8 weeks (320 hours) full time	End of Junior Year (summer before graduation) and department approval

SENIOR YEAR

FIRST SEMESTER				SECOND SEMESTER			
Course Number	Course Title	Credit Hours	Pre-requisite	Course Number	Course Title	Credit Hours	Pre-requisite
SOEN 4311	Software Architecture and Design	3	SOEN 3311		CS, CE, or IT Elective ***	3	
ASSE 4311	Assessment III - SE (Capstone)	3	ASSE 3211		Social Science Elective II	3	
	Natural Science Elective**	4		SOEN 4313	Software Project Management	3	GEIT 3351
SOEN 4312	Software Testing and Quality Assurance	3	GEIT 3351		SE Elective II ****	4	
	SE Elective I ****	3					
Total Credit Hours		**16**		**Total Credit Hours**		**13**	
TOTAL DEGREE CREDIT HOURS = 132							

*** Social Science Elective**
ECON1311 Intro. to Macroeconomics,
ECON1312 Intro. to Microeconomics,
GEGR1311 World Regional Geography,
HIST1311 World Civilization,
PSYC1311 Intro. to Psychology

**** Natural Science Elective**
BIOL1411 Introductory Biology,
CHEM1411 Introductory Chemistry,
CHEM1421 Chemistry for Engineers I,
CHEM1422 Chemistry for Engineers II

***** CS/CE/IT Electives (3 Hours)**
Any CS, CE, and IT courses at 3000 or 4000 level

****** SE electives (6 Hours)**
SOEN 4321: Software Maintenance and Evolution
SOEN 4322: Software Security
SOEN 3314: Formal Methods in Software Engineering

PMU students participated in the Cloud computing summit in Bahrain

PMU was present in the Amazon Web Services (AWS) summit which is considered as one of the biggest cloud computing event taking place in the Middle East. This event was held in Bahrain on 30th of September 2018. CCES already offers a “Cloud Computing” course which conducts its labs on the state-of-the-art AWS cloud platform. Some of the CCES students who are taking or already took Cloud Computing course were present in that event to gain more hands on experience. The summit was very beneficial for our students who expressed their desire to be nominate and attend future summits. More information about this event is available in this link: https://www.youtube.com/watch?v=E-k3JSBS3z4

Breakout Sessions	Management Track	Technical Track	Spotlight Track
9:00 – 9:50	Secure and Automate AWS Deployments with Next-Generation Security (Palo Alto Networks)	Practical DevSecOps: What Can You Do to Continuously Adapt to Threats (Trend Micro)	Let's get Connected: Exploring Connectivity in your Cloud Journey (Batelco)
10:00 – 10:50	My CIO Says We're Going All-In and Migrating to AWS. Now What?	An Introduction to AWS	Panel: Government Migration in Action
11:00 – 12:15	Keynote		
12:15 – 13:15	Lunch		
13:15 – 14:05	How Do I Prepare My Team? Building on Existing Strengths	Microsoft Workloads on AWS	Building an Ecosystem: Partnerships and Programs for Startup Development in the Middle East
14:10 – 15:00	Top Cloud Security Myths Dispelled	Introduction to VMware Cloud on AWS	The Financial Services Sector Journey to the Cloud – Paved in Governance
15:00 – 15:30	Prayer Time / Break		
15:30 – 16:20	Connected IoT and Intelligent Solutions	Migrating Your IT	Get More Out of the Cloud – AWS Training and Certification

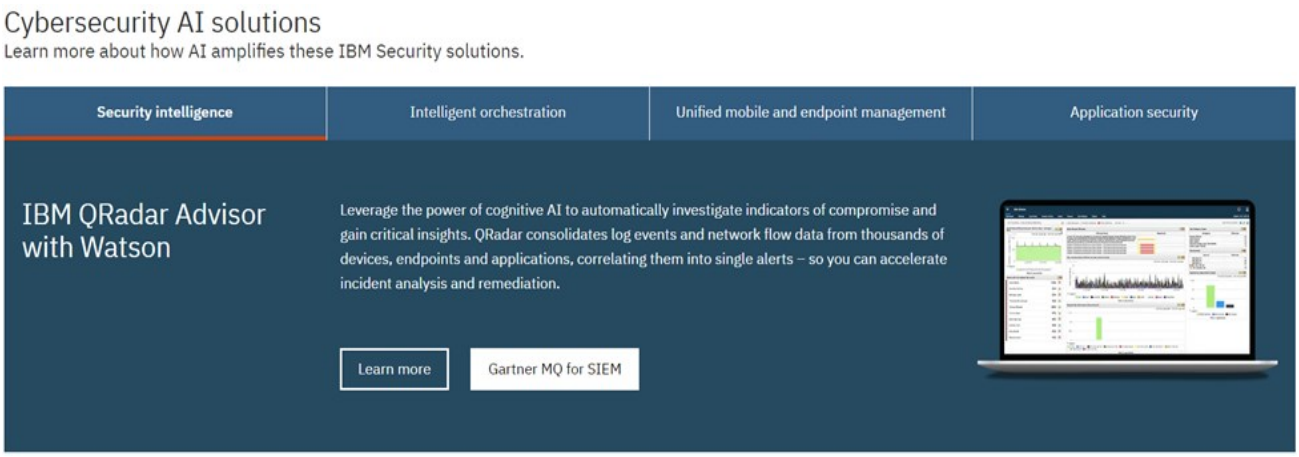
Faculty Research Activities within the College of Computer Engineering and Science

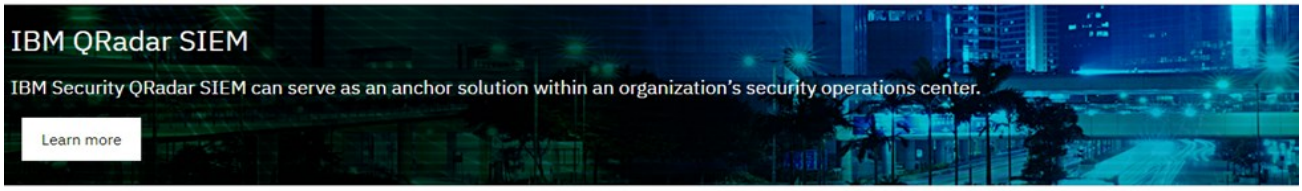
Inline with PMU vision and goals to be among the leading regional and international universities in the area of research, CCES faculties were very productive in terms of publications in reputable conferences as well as refereed Journals. Research areas covered various topics including: the application of Machine Learning in various domains, Image Processing application in the medical field, Quantum computing, protocol formal verifications, cloud computing, Internet of the Things. CCES faculties made sure to involve undergraduate PMU students in some of the research work to give them the opportunity to get exposed to the area of research. Students were also given the chance to attend regional conferences and present papers on behalf of their professors, which was a great experience for them and is considered as a good preparation for the students who intend to pursue graduate studies.

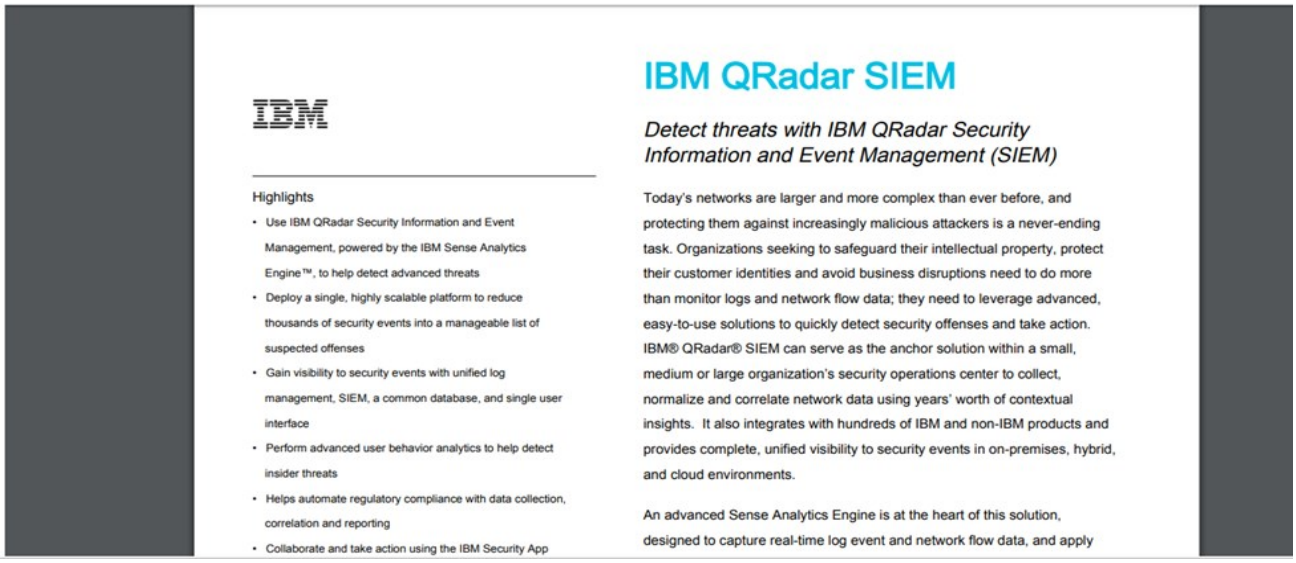
Journals and Conferences Publications
Ghazanfar Latif, D.N.F. Awang Iskandar, Jaafar Alghazo, Nazeeruddin Mohammad, Enhanced Glioma MRI Classification using Hybrid Statistical and Wavelets Features, IEEE Access.
Jaafar M. Alghazo, Ghazanfar Latif, Ammar Elhassan, Loay Alzubaidi, Multi-Language Handwritten Digits Recognition based on Novel Structural Features and Random Forest, *Journal of Imaging Science & Technology*.
Jawad F. Al-Asad, Adil H. Khan, Ghazanfar Latif* and Hajji W., QR Based Despeckling Approach for Medical Ultrasound Images, *Current Medical Imaging Reviews*.
Roaa Alkhalaf, Rawan Alkhalaf, Ghazanfar Latif, Nazeeruddin Mohammad and Jaafar Alghazo, Arabic Sign Language (ArSL) Recognition System using Convolutional Neural Network (CNN), *International Journal of Pure and Applied Mathematics - IJPAM*.
Ghazanfar Latif, D.N.F. Awang Iskandar, Jaafar Alghazo, Multiclass Brain Tumor Classification using Region Growing based Tumor Segmentation and Ensemble Wavelet Features, *International Conference on Computing and Big Data (ICCBD 2018), Charleston, South Carolina, USA (ACM)*.
Loay Alzubaidi, Ghazanfar Latif, Jaafar Alghazo, Realtime Saudi License Plate Recognition using Raspberry Pi, *International Journal of Engineering & Technology*.
Danyah A. Alghmgham, Ghazanfar Latif, Jaafar Alghazo, Loay Alzubaidi, Autonomous Traffic and Road Sign (ATRS) Detection and Recognition using Deep CNN, *16th International Learning and Technology Conference: Artificial Intelligence and Machine Learning: Intelligence is Power, March, 2019, Jeddah, KSA*.
Mohsin Butt, Ghazanfar Latif, D.N.F. Awang Iskandar, Adil H. Khan, Jaafar Alghazo, 3D Convolutions Neural Network based Diabetic Retinopathy Detection from Fundus images, *16th International Learning and Technology Conference: Artificial Intelligence and Machine Learning: Intelligence is Power, March, 2019, Jeddah, KSA*.
M. Al-Mouhamed, M.A. Khan, N. Mohammad, "Adaptive Tiling for Parallel N-Body Simulations on Many Core", Submitted to Journal of Parallel Computing in Oct, 2018
S. Muhammad, N. Mohammad, A. Bashar, M.A. Khan, "Designing Human Assisted Wireless Sensor and Robot Networks Using Probabilistic Model Checking", Journal of Intelligent Robotic Systems, 2018
Abul Bashar, Nazeeruddin Mohammad, Muhammad Shahabuddin, Modeling and Evaluation of Pre-copy Live VM Migration using Probabilistic Model Checking, 12th International Conference on Signal Processing and Communication Systems, ICSPCS'2018.
Mumtaz, Tariq, Shahabuddin Muhammad, Nazeeruddin Mohammad, Muhammad Imran Aslam, and Irfan Ahmed. "Modeling and Evaluation of Mobility Management in mmWave Cellular Networks." In *2018 IEEE 21st International Multi-Topic Conference (INMIC)*, pp. 1-6. IEEE, 2018.
Cyrine Gharbi, Mohamed Wiem Mkaouer, Ilyes Jenhani and Montassar Ben Messaoud (2019) On the classification of software change messages using Multi-label Active learning. In Proceedings of the *34th ACM/SIGAPP Symposium on Applied Computing (SAC 2019)*: pp. 1746-1753. April 2019, Limassol, Cyprus
Ammar El Hassan, Ilyes Jenhani and Ghassen Ben Brahim (2018) Remedial Actions Recommendation via Multi-Label Classification: A Course Learning Improvement Method. *International Journal of Machine Learning and Computing (IJMLC)*, 8 (6) pp. 583-588.
Omar Darwish, Ala Al-Fuqaha, Ghassen Ben Brahim Ilyes Jenhani and Muhammad Anan (2018) Towards a Streaming Approach to the Mitigation of Covert Timing Channels. In Proceedings of the *14th International Wireless Communications and Mobile Computing Conference (IWCMC 2018)*: pp. 255-260. IEEE Xplore, June 2018, Limassol, Cyprus.
Zainab AlSalman, Nawal AlSomali, Sarah AlSayari, A. Bashar, "Speech Driven Robotic Arm for Sorting Objects Based on Colors and Shapes," in Proc. of *International Conference on Inventive Computation Technologies (ICICT 2018)*, Coimbatore, India, 15-16 Nov. 2018.
A. Shaikh, A. Bashar, M. Rafiq, " Emerging Trends in ICTs and its impact on Organizational Innovation through Knowledge Management," International Journal of Business and Management, Vol. 2, No. 3, pp. 1 - 8, 2018.

BM Meeting with CCES Faculty to Discuss About Establishing Cybersecurity Lab

In the efforts of launching a new Cybersecurity lab to meet the demand of the PMU stakeholders, on January 31st, 2019 CCES faculty along with PMU CIO and his team attended an on-site meeting with IBM team. During this meeting, IBM presented its Cybersecurity solution in designing state of the arts Cybersecurity Lab. The topics discussed IBM QRadar includes: IBM Security Strategy and Framework, IBM strategy for building cognitive Cyber Security lab, Detecting and identifying security events and productively defeat internal and external threats, Exploring anomalous behavior and new vulnerability, Counter and mitigate sophisticated attacks with cyber threat hunting system, Protect against security threats with unified incident response orchestration and automation platform, Addressing data protection challenges and reducing risk by controlling the data that really matters. The meeting was very beneficial for all parties and is considered as a good initiation for possible future academic and professional collaborations.







IBM

IBM QRadar SIEM

Detect threats with IBM QRadar Security Information and Event Management (SIEM)

Highlights

- Use IBM QRadar Security Information and Event Management, powered by the IBM Sense Analytics Engine™, to help detect advanced threats
- Deploy a single, highly scalable platform to reduce thousands of security events into a manageable list of suspected offenses
- Gain visibility to security events with unified log management, SIEM, a common database, and single user interface
- Perform advanced user behavior analytics to help detect insider threats
- Helps automate regulatory compliance with data collection, correlation and reporting
- Collaborate and take action using the IBM Security App

Today's networks are larger and more complex than ever before, and protecting them against increasingly malicious attackers is a never-ending task. Organizations seeking to safeguard their intellectual property, protect their customer identities and avoid business disruptions need to do more than monitor logs and network flow data; they need to leverage advanced, easy-to-use solutions to quickly detect security offenses and take action. IBM® QRadar® SIEM can serve as the anchor solution within a small, medium or large organization's security operations center to collect, normalize and correlate network data using years' worth of contextual insights. It also integrates with hundreds of IBM and non-IBM products and provides complete, unified visibility to security events in on-premises, hybrid, and cloud environments.

An advanced Sense Analytics Engine is at the heart of this solution, designed to capture real-time log event and network flow data, and apply