جَامِعَةُ العُلُومِ وَالتِكنُولُوجِيَا
University of Science & Technology

International Conference
on Intelligent Technology System and Service for Internet of Everything

ITSS-IoE 2021

Held F2F at University of Science and Technology, Sana'a, Yemen

And Virtually via online meeting platforms.

1-2 November 2021

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Message from the ITSS-IoE2021 Honorary Chair
University of Science and Technology Rector
Dr. Adel Ahmed Al Motawakel

On behalf of the University of Science and Technology, I am very delighted to be here today for the opening of this conference. Let me take the opportunity to welcome you, both scholars and participants from inside and outside Yemen, to the campus of the University of Science and Technology, Sana'a-Yemen. This conference provides a very unique opportunity for all of us because of its scope on *"Intelligent Technology, System and Service for Internet of Everything (ITSS-IoE*), which is as an extension of several events and activities and development workshops that the university endeavors to implement during the academic year 2021/2022, contributing in improving the level of higher education, scientific research and community service in the Republic of Yemen.

The organization of this conference comes in line with the national vision to build the modern Yemeni state in the education sector, which aims to develop and revolutionize education in Yemen to ensure the improvement of its outcomes to advance the country's future. In addition, this conference is an addition to the official efforts aimed at developing the ICT sector in the Republic of Yemen.

I am pleased to see that you place such a strong emphasis on establishing international cooperation and partnerships between the university and various institutions related to communications and information technology to exchange experiences and development ideas, as information technology has become a parameter for the development and progress of countries and a key driver for their development through innovation and knowledge. The rapid technological development opens up great prospects for the university graduates in order to obtain career opportunities and different jobs.

The organization of this conference emanates from the attention of the University of Science and Technology' in scientific research, as one of the most important basic functions of universities in addition to education and community service. Of course, the research carried out by universities is one of the most important indicators of quality and excellence in the ranking of universities locally, regionally and internationally. Once more, we should admit that the universities have an important role in moving development in any country that seeks progress and advancement.

Finally, I would like to extend my sincere thanks and gratitude to my colleagues in the Faculty of Computing and Information Technology and to everyone who engaged in the preparation and organization of this conference. Hopefully, we all can significantly contribute to the nation's advancement in communications and information technology. To all of our distinguished attendees and participants, thank you for being here, welcome, and enjoy the conference!

Message from the ITSS-IoE2021 Co-organizer
Assoc. Prof. Dr. Md Arafatur Rahman
Advisor, RITECHS, Malaysia, Malaysia

On behalf of the Organizing Committee, we would like to welcome you to the International Conference on Intelligent Technology, System and Service for Internet of Everything (ITSS-IoE 2021). A conference is a biennial event organized by the RITECH Solution Malaysia, University Science and Technology Yemen, Community College Sana'a, and IEEE Yemen subsection. The objective of the conference is promoting original and unpublished research works covering science, technologies, applications and related categories on computing, communication and electronics domains. It provides a high profile, leading-edge forum for researchers and engineers to exchange their contributions on advances and innovations.

Topics covered this year include advanced engineering, intelligent technologies, and their applications on advanced computing and communication to ensure social development using Internet of Everything (IoE) systems for targeted audiences (i.e. users, researchers, robots, machines) and future ecosystems. In ITSS-IoE 2021, we received 131 submissions from 21 countries, out of which 40 papers were selected for regular oral presentation. All submissions went through a careful anonymous review process (3 or more reviews per submission).

We would like to thank everyone who has given his or her time, energy and ideas to assist in organizing this event, including all the members of the Organizing Committee, the TPC Chair, Co-Chairs, TPC members and all the reviewers, and our distinguished Keynote speakers as well as Invited speakers who have agreed to address the conference attendees. In particular, we would like to thank University Science and Technology Yemen, and Sana'a Community College, Yemen for involving ITSS-IoE this year as a co-organizer. We also wish to thank all of our sponsors, especially IEEE Yemen Sub-Section for being the Technical Co-sponsor, who has made this event possible. It is through the collective efforts of the individuals and organizations that we are able to bring you a great event!

Message from the ITSS-IoE2021 Co-organizer
Sana'a Community College, Sana'a Yemen
Dr. Mobarak Saif

We are very pleased to be able to welcome those of you who have been with us for a long time now as well as those who are new to the research community. Today marks our 1st conference and we are proud to be able to organize it with all of you.

Before I begin, I would like to express my sincere appreciation to all of you who helped us make this conference come together to become a success. Especially the Organizer UST, the co-organizers RITECH Solution Malaysia, and IEEE Yemen subsection, we couldn't have done it without you!

During the conference, you will be learning about Intelligent Technology, System and Service for Internet of Everything, how useful it is for you and what does the future hold for all of us in the context of the themes of this conference. It is our pleasure to welcome the speakers and researchers that have come from all over the world to share their knowledge and enhance our mental horizon. Today's conference has about 131 submissions from more than 18 countries, making this conference a truly international conference.

The major outcomes that we expect from this conference are a national and international framework for the changing research systems around the world towards IoE. Hopefully, this conference will be the first of many conferences in the future to organize.

Last but not the least, I would like to thank all of you and I wish you all a very fruitful conference.

Message from the Dean of the Faculty of Computing and Information
Technology
Assoc. Prof. Dr. Belal Al-Fuhaidi

On behalf of the Faculty of Computing and Information Technology, and Technology (UST), I would like to extend our warmest welcome to all the participants and attendees to the First International Conference on Intelligent Technology, System and Service for Internet of Everything (ITSS-IoE 2021). A conference is a biennial event organized by the RITECH Solution Malaysia, University Science and Technology Yemen, Community College Sana'a, and IEEE Yemen subsection.

It aims to provide a platform for researchers, scholars, practitioners, and application developers to share and disseminate knowledge and information about advanced engineering, intelligent technologies, and their applications on advanced computing and communication to ensure social development using Internet of Everything (IoE) systems for targeted audiences (i.e. users, researchers, robots, machines) and future ecosystems. This conference will be presented by 5 keynote speakers. The keynote speakers are academics, an industrial expert and a leader in youth community development. We have received 131 submissions from 23 countries and from them, out of which 40 papers were selected for regular oral presentation. All submissions went through a careful anonymous deep review process (3 or more reviews per submission), the number of reviewers reached to 156 reviewers .The finally accepted papers will be published with the IEEE proceeding in *ieeeXplore*. Out of all submissions, the highest numbers of submissions are from Artificial Intelligence and Decision-making using IoE Technology is 43, Embedded Computing and Cyber-Physical Systems for the IoE are 13, Emerging Application of IoE 29, Intelligent Technologies for Internet of Everything 23, and from Internet of Things and Intelligent Data Analytics for Internet of Everything 19 submissions.

I would like to express my sincere gratitude to all distinguished keynote speakers, industrial speakers, and invited speakers for their presence and contributions to the conference.

Congratulations to the program committee members for their continuous and endless efforts in ensuring the success of this joint conference.

I sincerely hope that all participants and attendees will benefit and gain knowledge from keynote speakers and presented papers of this joint conference and wishing the conference to be a great success.

MESSAGE from IEEE YEMEN SUBSECTION CHAIR

Assoc. Prof. Dr. Ammar Zahary

First, I would like to welcome all of you to the International Conference on Intelligent Technology, System and Service for Internet of Everything 2021 (ITSS-IoE 2021), which is held in dual mode virtual and face to face at University of Science and Technology, Yemen on November 1-2, 2021.

We, in the Executive Committee of IEEE Yemen Subsection, are pleased to congratulate the organizing committee of the ITSS-IoE 2021, which is organized by University of Science and Technology, Yemen, RITECH Solution Malaysia, and Sana'a Community College, Yemen. The conference is technically sponsored by IEEE Yemen Subsection. This conference allows dual modes of presentations, on-site and online virtually via online meeting platforms. ITSS-IoE 2021 provides space for local and international researchers to engage in the production of publication and research collaborations. This participation essentially leads to transferring the knowledge and exchanging of researchers' experiences.

The scientific committees have adhered to the professional criteria in reviewing all submitted papers to ensure the quality of accepted papers, which are supposed to be published in IEEE XPLORE.

We thank the organizing committee and scientific committee for their good efforts in making this conference successful. We wish them great success and we assure that we will always support their distinguishable conferences.

Massage from the ITSS-IoE2021General Chairs

Abdulrahman Alsewri, PhD
General Chair of ITSS-IoE2021
Associate Professor
Faculty of Computing
University Pahang Malaysia, Malaysia

Dr. Noman Qaid Al Naggar
General Chair of ITSS-IoE2021
Prof. of Biomedical Engineering
Assistant Rector for Academic Affairs
University of Science and Technology

Belal Abdullah Alfuhadi, PhD
General Chair of ITSS-IoE2021
Associate Professor
Faculty of Computing and IT
University of Science and Technonlogy,
Sana'a -Yemen

On behalf of the ITSS-IoE 2021 Organizing Committee, it is a great pleasure for me to welcome all participants to the International Conference on Intelligent Technology, System and Service for Internet of Everything (ITSS-IoE 2021). A conference is a biennial event organized by the RITECH Solution Malaysia, University Science and Technology Yemen, Sana'a Community College, and IEEE Yemen subsection.

The aim of the ITSS-IoE 2021 is to provide a forum for delegates from the industry and academia to exchange ideas and present their research works. In addition, it is an ideal venue for interactions and for them to establish all-important contacts with each other in all aspects of Technology.

This time, due to the pandemic, the ITSS-IoE 2021 is conducted using a hybrid platform (F2F for Yemeni researchers, and a webinar platform for researchers from outside Yemen). With over 131 full papers received, the Technical Program Committee has the overwhelming task of selecting papers of outstanding quality and diversity. Finally, 40 papers were selected, involving authors from various countries. The keynote speeches will be delivered by some of the most outstanding experts in the field of IoE, Computer Systems, and Technology with respect to current issues that are related to the digitalization of society using advanced technologies.

Finally, I would like to express my deepest appreciation to all members of the organizing committee who provide relentless effort, commitment and dedication in making ITSS-IoE 2021 a successful event. I also would like to express my profound gratitude to all co-organizers of this event as well as our media partners for this conference. Not forgetting, my special appreciation to all speakers that submitted their works and attended this conference. I wish all a very successful conference with fruitful discussions.

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KEYNOTE SPEAKER 1

Prof. Dr. Kim-Kwang Raymond Choo
University of Texas at San Antonio, USA

Keynote Title: Internet of Things (IoT) Security and Forensics: Challenges and Opportunities

Internet of Things (IoT) devices are becoming commonplace in our society, due to their widespread applications (e.g., environmental monitoring, smart cities, healthcare, surveillance, and battlefields such as Internet of Battlefield Things). Such devices are also generally capable of capturing a broad range of information; including digital artifacts that can be used for cyber threat intelligence and inform security mitigation strategy formulation. There are, however, a number of challenges associated with designing IoT cyber security and threat intelligence solutions. In addition to the technical challenges, there are also associated legal and policy challenges that need to be considered in the design and deployment of such solutions   in   practice.

In this presentation, we will explore the challenges from technical, legal and policy perspectives. For example, how do we use machine/deep learning to facilitate detection of real-time attacks against IoT devices and systems, and how can we automatically identify and collect digital evidence in a forensically sound manner which can be subsequently used for cyber threat intelligence? In the event that the attackers use sophisticated tools to obfuscate their trails, can we design machine/deep learning techniques to unobfuscate and/or identify and exploit vulnerabilities to get access to digital evidence? What are the potential legal implications and challenges? Can we also design explainable AI techniques to facilitate the explanation and inclusion of such digital evidence and cyber threat intelligence in court proceedings or presentations to C-level or boards in organizations? Based on these discussed challenges, we will identify potential opportunities for stakeholders in academia (e.g., students and researchers), industry and government.

Keynote Speaker Profile

Kim-Kwang Raymond Choo received the Ph.D. in Information Security in 2006 from Queensland University of Technology, Australia. He currently holds the Cloud Technology Endowed Professorship at The University of Texas at San Antonio (UTSA). He serves as Department Editor of IEEE Transactions on Engineering Management; Associate Editor of IEEE Transactions on Dependable and Secure Computing, and IEEE Transactions on Big Data; Technical Editor of IEEE Network Magazine; Editor of Future Generation Computer Systems; and on the editorial board of Computers & Security, Cluster Computing, Electronic Commerce Research, IEEE Blockchain Technical Briefs, IEEE Internet of Things Journal, and Journal of Network and Computer Applications.

He is an ACM Distinguished Speaker and IEEE Computer Society Distinguished Visitor (2021 - 2023), and included in Web of Science's Highly Cited Researcher in the field of Cross-Field - 2020. In 2015, he and his team won the Digital Forensics Research Challenge organized by Germany's University of Erlangen-Nuremberg. He is the recipient of the 2019 IEEE Technical Committee on Scalable Computing Award for Excellence in Scalable Computing (Middle Career Researcher), the 2018 UTSA College of Business Col. Jean Piccione and Lt. Col. Philip Piccione Endowed Research Award for Tenured Faculty, the British Computer Society's 2019 Wilkes Award Runner-up, the 2014 Highly Commended Award by the Australia New Zealand Policing Advisory Agency, the Fulbright Scholarship in 2009, the 2008 Australia Day Achievement Medallion, and the British Computer Society's Wilkes Award in 2008. He has also received best paper awards from the IEEE Consumer Electronics Magazine for 2020, EURASIP Journal on Wireless Communications and Networking (JWCN) in 2019, IEEE TrustCom 2018, and ESORICS 2015; the Korea Information Processing Society's Journal of Information Processing Systems (JIPS) Survey Paper Award (Gold) 2019; the IEEE Blockchain 2019 Outstanding Paper Award; and Best Student Paper Awards from Encrypt 2019 and ACISP 2005.

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KEYNOTE SPEAKER 2

Assoc. Prof. Dr. Md Abdus Samad Kamal
Graduate School of Science and Technology, Gunma University

Keynote Title: Towards Cyber-physical Control of Vehicles at Urban Intersections in the Internet-of-Vehicles (IoV) Framework

Road transportation is heading towards a paradigm shift via the widespread use of vehicle-to-vehicle or infrastructure (V2V or V2I) communication systems to create a connected vehicle environment (CVE). Furthermore, the introduction of 5G/6G wireless technology integrated with edge-cloud computing is expected to create the Internet-of-vehicles (IoV) in the coming future. Such IoV is expected to bring opportunities to realize the best-coordinated traffic in a road network effectively, and at the same time, the challenges on how to utilize the massive volume of information. A novel cyber-physical coordination scheme is proposed in the IoV framework to control the intersection traffic on urban roads. The vehicles, or physical agents, may pass the intersection smoothly utilizing the timings of traffic lights provided in advance. In cyberspace in the cloud, the durations of upcoming traffic lights are computed by a group of cyber agents with the information provided by IoV to compute the least-restrictive right-of-way collectively to all vehicles at the intersection. The proposed scheme is evaluated through microscopic traffic simulation at various penetration rates of the automated vehicles, and performances of overall traffic are compared with existing schemes.

Keynote Speaker Profile

Dr. Md Abdus Samad Kamal is an Associate Professor in the Graduate School of Science and Technology, Gunma University, Japan. He received B.Sc. Engg. degree from Khulna University of Engineering and Technology (KUET), Bangladesh, in 1997 and the Master and Ph.D. degrees from Kyushu University, Japan, in 2003 and 2006, respectively. He was a Lecturer with KUET from 1997 to 2000, an Assistant Professor with International Islamic University Malaysia, from 2006 to 2008, a Researcher with Kyushu University in 2006, and 2008 to 2011, a Researcher with The University of Tokyo, Japan from 2011 to 2014. He worked as a Visiting Researcher with Toyota Central R & D Labs., Inc., Japan, from 2014 to 2016. He was a Senior Lecturer in the School of Engineering, Monash University Malaysia, from 2016 to 2019. His research interests include intelligent transportation systems, cooperative control of connected and automated vehicles, and the applications of model predictive control. Dr. Kamal is a member of the Society of Instrument and Control Engineers (SICE), a Senior Member of the Institute of Electrical and Electronic Engineers, and a Chartered Engineer of the Institution of Engineering and Technology (IET).

KEYNOTE SPEAKER 3

Assoc. Prof. Dr. Fuaad Hasan Abdulrazzak
Thamar University, Yemen.

Keynote Title: Towards Cloud and Fog computing towards IoE: Issues, Challenges, and Trends

The ICT industry is witnessing rapid developments that have led to what is known today as the Fourth Industrial Revolution. The impact of these developments has gone beyond organizations to reach individuals, especially with the massive amount of data flowing through networks and the evolution of technologies for data transmission, storage, analysis, artificial intelligence and object control. As a result of the development of cloud computing services and the transition from the concept of the Internet of Things, where the focus is on physical devices, which are accessed via the Internet to the Internet of Everything (IoE) where data, processes, things and all people are connected through smart communication technologies and applications.

Current research focuses on raising the decentralization of communication networks, improving the quality of service and meeting real-time processing requirements of data. Fog computing has emerged as a solution to eliminate the challenges facing cloud computing such as delay and bottleneck by moving the management of storing and processing data to the network's edges. That in turn provides better opportunities to create an advanced IoE environment with valuable smart services. This talk highlights the main and most important challenges, issues and trends related to cloud and Fog computing in the context of IoE.

Keynote Speaker Profile

Dr. Fuaad Hasan Abdulrazzak, Associate Professor, Faculty of Computer Science and Information Systems, Thamar University. Currently, he is working as the Academic advisor of the Ministry of Higher Education and Scientific Research, Executive Director of Yemen Center for Information Technology in Higher Education (YCIT-HE), and dean of computer and IT faculty, Saba University. In addition, former deputy dean and head of the IT department in the Faculty of Computer Science and Information Systems, Thamar University. He received his B.S. in Computer Science from Zarqa University (ZU), Jordan, in 2001. He received his M.S. and PhD degrees in Computer Science University Putra Malaysia, in 2005 and 2012 respectively. His area of research includes parallel and distributed computing, fiber optics, resource management, Cloud computing & IoT, and performance modelling and analysis. He has lectured many courses in networks and communication technology in addition to supervising many thesis in the same area.

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KEYNOTE SPEAKER 4

Assistant Prof. Dr. Md Zakirul Alam Bhuiyan
Dept. of Comp. & Info. Sciences, Fordham University, NYC, NY

Keynote Title: Is Your Smartphone Smart Enough to Prevent You from Being Watching
Through its Wi-Fi: An Up-and-Coming Security Concerns

Currently, wireless radio signals are omnipresent and are around us; some pass through us, and some reflect off us. Tracking these signals gives the limit of ISM band radiometric detection to a new level, including our motion detection, gesture recognition, etc. In this talk, we will focus on answers to questions, without interrupting the data communication, how can radio signals be leveraged passively for various sensing tasks. For example, just raise your hand and finger-swipe into the air, your lights will power down; swipe your hand left-to-right, your TV channel will be changed; just tap your mobile screen to see your heartbeat. More importantly, can we imagine the signal features can also be leveraged to monitor our activities in an unauthorized manner, that is, what are we talking about and what are we doing at home or office, where are we going, and so on? These can be easily done through our mobile or router device by compromising their Wi-Fi signals from a remote place when we are the targets of hackers or some intended authorities. This is going to bring serious up-and-coming security and privacy concerns in our daily life. We will highlight how wireless signals monitoring can extend our senses, enabling us to track humans or objects through walls, behind closed doors, and in the dark where we cannot see, even cameras don't work well, and security personnel cannot get in. Finally, we will discuss a set of interesting security and privacy problems with potential solutions to prevent its unauthorized utilization.

Keynote Speaker Profile

Md Zakirul Alam Bhuiyan, PhD, is currently an Assistant Professor of the Department of Computer and Information Sciences at the Fordham University, NY, USA. He is the Director of Dependable and Secure System Research (DependSys) Lab and is affiliated with Fordham Center for Cybersecurity. Earlier, he worked as an Assistant Professor at Temple University and an Adjunct Professor at Harvard University. His research focuses on dependability, cybersecurity and privacy, and emerging IoT/CPS applications. Dr. Bhuiyan authored/co-authored over 140 publications that appeared in many prestigious journals, including top-tier IEEE/ACM/Elsevier journals/transactions, and conferences. 14 of his research papers have become the "ESI Highly Cited Papers" and two of them become "Hot Paper" in Computer Science fields. He was named on Stanford University's List of Top 2% Scientists of the World 2020. He has also received the IEEE TCSC Award for Early Career Research Excellence (2016-2017) and the IEEE Outstanding Leadership Awards (2016, 2017, 2020), and so on. He has served as an organizer, general chair, program chair, workshop chair, and TPC member of various international conferences, including IEEE INFOCOM. He is a Senior Member of IEEE and a member of ACM.

KEYNOTE SPEAKER 5

Dr. Reyad Mehfuz
Staff R&D Engineer, Seagate Technology, UK

Keynote Title: HAMR Technology: The Future of Data Storage

The amount of digital data the world creates continues to grow at an astronomical rate. Global data growth in the next three years will be more than the data created over the past 30 years. The rapidly increasing volume of data is due to increasing global internet and mobile usage, hyperscale cloud-computing traffic and the prevalence of technologies including the internet of things (IoT), and artificial intelligence (AI). To meet this demand, heat-assisted magnetic recording (HAMR) technology has been developed as the next major enabler of high capacity hard disk drives. HAMR overcomes the limitation of a conventional perpendicular magnetic recording (PMR) technology by raising the temperature of the recording media momentarily to near its Curie temperature in order to reduce its magnetic coercivity. The recorded bit is then quenched to the high anisotropy state by cooling to ambient temperature. With this, HAMR has the potential to enable aerial densities significantly higher than the PMR technology. HAMR uses a near field transducer coupled with a laser diode to confine optical energy to a small region on the rotating disk media that is an order of magnitude smaller than the optical wavelength of the laser light used. This talk will highlight some of the major breakthroughs and challenges to realize the HAMR as the future of data storage.

Keynote Speaker Profile

Professor Dr. Reyad Mehfuz works in Seagate Technology's R&D department at Springtown UK , where he is part of the team developing Heat Assisted Magnetic Recording (HAMR) heads for the next-generation magnetic hard drives. He specializes in providing photonic design solutions for reliable device manufacture. In his current role, he works as the lead design engineer of a project involving several active and passive photonic components that eventually triggers a plasmonic transducer to generate a sub-50 nm heat-spot.

He has numerous intellectual properties in the field of integrated photonics. In recognition of his outstanding contribution, he received the Seagate Technology Hall of Fame Award in the year 2020.

ITSS-IoE2021 Tentative Program

DAY 1:		Monday 1st November, 2021 Time Zone: GMT+3
Start (GMT+3)	**End (GMT+3)**	**Agenda**
		OPENING CEREMONY Webinar - Zoom Link: https://us02web.zoom.us/j/86288966510?pwd=VkEvUVhsdzZ4Q0UyWnNqTHFyMEtnZz09 , Passcode: 123456 Facebook LIVE: https://www.facebook.com/itssioe2021 https://www.facebook.com/www.ust.edu.ye YouTube Live: https://bit.ly/ustyemen1994
08:00	08:50	Conference Registration and Participation Arrival
08:50	09:00	Senior Guests Arrival
09:00	09:05	National Anthem
09:05	09:10	Quran Kareem
09:10	09:20	Welcoming Speech by *Assoc. Prof. Dr. Belal Al-fuhaidi*, the ITSS-IoE 2021 General Chair, University of Science and Technology, Yemen
09:20	09:30	Organizer Speech by *Dr. Adel Almutwakel*, the ITSS-IoE 2021 Honory Chair, Chair of University of Science and Technology , Yemen
09:30	09:40	Speech and officially opening ITSS-IoE2021 by, **Minister of High Education,** Yemen
09:40	09:50	Officially Speech by Official Sponsor: *Prime Minister*, Yemen.
09:50	09:55	Co-organizer Speech by *Assoc. Prof. Dr. Arafatur*, the ITSS-IoE2021 Honory Chair, Advisor, RITECHS, Malaysia
09:55	10:00	Co-organizer Speech by Sana'a Community College, Sana'a Yemen.
10:00	10:05	Conference Reportage
10:05	10:45	Keynote Speech 1 by: *Prof. Dr. Kim-Kwang Raymond Choo,* University of Texas at San Antonio, **USA** **Title**: "Internet of Things (IoT) Security and Forensics: Challenges and Opportunities**"**
10:45	11:00	**Break**
11:00	11:40	Keynote Speech 2 by: *Assoc. Prof. Dr. Md Abdus Samad Kamal,* Gunma University, Japan, **Former Researcher Toyota R&D, Japan.** **Title**: Towards Cyber-physical Control of Vehicles at Urban Intersections in the Internet-of-Vehicles (IoV) Framework
11:40	12:20	Keynote Speech 3 by: *Assoc. Prof. Dr. Fuaad Hasan Abdulrazzak*, Thamar University, **Yemen**. **Title**: "Cloud and Fog Computing towards IoE: Issues, Challenges, and Trends"
12:20	12: 50	Introduce RITECHS Solutions, By *Assoc. Prof. Dr. Arafatur,* Advisor, RITECHS, Malaysia

12:50	13:45	**Break**		
		Parallel Session I		
13:45	15:15	**Auditorium (1A)** Webinar - Zoom Link: https://us02web.zoom.us/j/86288 966510?pwd=VkEvUVhsdzZ4Q0 UyWnNqTHFyMEtnZz09 Passcode: 123456	**Hall CDC1 (1B)** **Google Meet:** https://meet.google.co m/vmc-fvye-pbg	**Hall CDC2 (1C)** **Google Meet:** https://meet.google.com/reh-ctcd-sdx
		6 papers	6 papers	6 papers
15:15	**15:35**	Introduce Ritechs Company		
		END OF DAY 1		

DAY 2:		Tuesday 2nd November 2021	Time Zone: GMT+3	
Start (GMT+3)	End (GMT+3)	**Agenda**		
		Webinar - Zoom Link: https://us02web.zoom.us/j/83917774510?pwd=TlhKeis3MDBjaEx2R2Y0bnlNQU5yUT09 , Passcode: 123456 Facebook LIVE: https://www.facebook.com/itssioe2021 https://www.facebook.com/www.ust.edu.ye YouTube Live: https://bit.ly/ustyemen1994		
08:00	08:30	Conference Registration and Participation Arrival		
08:30	09:10	Keynote Speech 4 by: ***Dr. Md Zakirul Alam Bhuiyan***, Fordham University, **USA** **Title**: "Is Your Smartphone Smart Enough to Prevent You from Being Watching Through its Wi-Fi: An Up-and-Coming Security Concerns".		
09:10	9:50	Keynote Speech 5by: ***Dr. Reyad Mehfuz***, Staff R&D Engineer, Seagate Technology, **UK**. **Title**: HAMR Technology: The Future of Data Storage		
09:50	**10:00**	***Break Session***		
		PARALLEL SESSION II		
10:00	11:55	**Auditorium (2A)** **Webinar - Zoom Link:** https://us02web.zoom.us/j/839 17774510?pwd=TlhKeis3MD BjaEx2R2Y0bnlNQU5yUT09	**Hall CDC1 (2B)** **Google Meet:** https://meet.google.com/r cb-awja-ajr	**Hall CDC2 (2C)** **Google Meet:** https://meet.google.com/puf-vtxv-grd
		7 papers	7 papers	7 papers
11:55	12:15	E-Learning Speech by: ***Assoc. Prof. Dr. Abdullah Alhashedi,*** vice-chair of Deanship of E-Learning and Distance Education, University of Science and Technology, Yemen **Title**: E-Learning: Challenges and Requirements.		
12:15	12:35	Scientific Research Speech by: ***Prof. Dr. Mohamed Mahdi***, Head of Scientific Research Department, Deanship of Postgraduate		

		Studies and Scientific Research, University of Science and Technology, Yemen
		Title: Scientific Research in Yemen (Case study: UST YEMEN).
12:35	**13:30**	***Break Session***
13:30	15:00	**CLOSING CEREMONY**
		Closing Speech by *Assoc. Prof. Dr. Belal Al-Fuhaidi*, General Chair - ITSS-IoE 2021.
		Scientific Research Award
		Announcement of Best Paper Award & Certificates
		END OF DAY 2

ITSS-IoE2021 Program with PARALLEL SESSION Presentation

Day 1:		Monday, November 1st	Time Zone: GMT+3
		Webinar - Zoom Link:	
		https://us02web.zoom.us/j/86288966510?pwd=VkEvUVhsdzZ4Q0UyWnNqTHFyMEtnZz09 ,Passcode: 123456	
		Facebook LIVE: https://www.facebook.com/itssioe2021 https://www.facebook.com/www.ust.edu.ye YouTube Live: https://bit.ly/ustyemen1994	

08:00-08:50		Conference Registration and Participation Arrival
08:50-09:00		Senior Guests Arrival
09:00-09:05	**Auditorium Session**	National Anthem
09:05-09:10		Quran Kareem
09:10-09:20		Welcoming Speech by *Assoc. Prof. Dr. Belal Al-fuhaidi*, the ITSS-IoE 2021 General Chair, University of Science and Technology, Yemen
09:20-09:30		Organizer Speech by *Dr. Adel Almutwakel*, the ITSS-IoE 2021 Honory Chair, Chair of University of Science and Technology , Yemen
09:30-09:40	**Location:**	Speech and officially opening ITSS-IoE2021 by, *Minister of High Education,* Yemen
09:40-09:50		Officially Speech by Official Sponsor: *Prime Minister*, Yemen.
09:50-09:55		Co-organizer Speech by *Assoc. Prof. Dr. Arafatur*, the ITSS-IoE2021 Honory Chair, Chair of Ritechs Company, Malaysia
09:55-10:00		Co-organizer Speech by *Sana'a Community College*, Sana'a Yemen.
10:00-10:05		Conference Reportage
10:05 -10:45		Keynote Speech 1 by: *Prof. Dr. Kim-Kwang Raymond Choo*, University of Texas at San Antonio, **USA** Title: "Internet of Things (IoT) Security and Forensics: Challenges and Opportunities".
10:45-11:00		***Break Session***

11:00-11:40	Keynote Speech 2 by: *Assoc. Prof. Dr. Md Abdus Samad Kamal*, Gunma University, **Japan, Former Researcher Toyota R&D, Japan**. Title: Towards Cyber-physical Control of Vehicles at Urban Intersections in the Internet-of-Vehicles (IoV) Framework
11:40-12:20	Keynote Speech 3 by: *Assoc. Prof. Dr. Fuaad Hasan Abdulrazzak*, Thamar University, **Yemen**. Title: "Cloud and Fog Computing towards IoE: Issues, Challenges, and Trends"
12:20-12:45	Introduce Ritechs Company by *Assoc. Prof. Dr. Arafatur*, the ITSS-IoE2021 Honorary Chair, Chair of Ritechs Company, **Malaysia**
12:45-13:45	**Break Session**

13:45-15:15	**Session 1A: Parallel Session** **Location:** Auditorium	
	Zoom Link: Webinar - Zoom Link: https://us02web.zoom.us/j/86288966510?pwd=VkEvUVhsdzZ4Q0UyWnNqTHFyMEtnZz09 Passcode: 123456	
	Track: Artificial Intelligence and Decision-making using IoE Technology (AI-IoE)	
	Chaired by: Assoc. Prof. Dr. Abdulrahman Alsewari & Assoc. Prof. Dr. Belal Al-Fuhaidi *Co-chaired by: Dr. Walid Shaher Yousef* *Technician: Mr. Mohamed Mahyob, Mr. Mobarak Alamry*	

	ID	**Paper Title**
13:45-14:00	12	Moseed Mohammed, Awanis Romli and Rozlina Mohamed. **Using Ontology to Enhance Decision-Making for Product Sustainability in Smart Manufacturing**
14:00-14:15	14	Wedad Al-Sorori, Abdulqader M. Mohsen, Yousef Ali, Naseebah A. Maqtary, Asma M. Altabeeb, Belal Al-Fuhaidi, Abdullah Alhashedi and Hasan Ali Gamal Al-Kaf. **Arabic Sentiment Analysis Towards Feelings Among Covid-19 Outbreak Using Single and Ensemble Classifiers**
14:15-14:30	25	Maha Fathy, Mohamed Salah Abood and Mustafa Maad Hamdi. **Optimization of Energy-Efficient Cloud Radio Access Networks for 5G using Neural Networks**
14:30-14:45	28	Nahid Hossain and Adil Ahnaf. **BERT-based Text Simplification Approach to Reduce Linguistic Complexity of Bangla Language**
14:45-15:00	29	Wafaa Ali, Ali Abdulredah and Ali Dakhil. **Web-based AI-IoT Multi Classifiers Model of IRIS Images in Real Live Farm Field**
15:00-15:15	38	G.Rajesh, Rishikesh Narayanan Ramachandran, Karthik Srivatsan Vaidyanathan, Parthiban Suresh and X.Mercilin Raajini. **Hybrid Neural Network for Handwritten Mathematical Expression Recognition system**

13:45-15:15	**Session 1B: Parallel Session** **Location:** CDC1 Hall	
	Google Meet: https://meet.google.com/vmc-fvye-pbg	
	Track: Internet of Things and Intelligent Data Analytics for Internet of Everything (IoT-IDA-IoE) + Emerging Application of IoE (EA-IoE)	
	Chaired by: Dr. Walid Shaher Yousef *Co-chaired by: Dr. Ghada Adel* *Technician: Mr. Ahmed Abdulqader*	

	ID	**Paper Title**
13:45-14:00	44	Fahd Alqasemi, Salah Alhagree, Ammar Zahary and Redhwan Shaddad. **An IEEE Xplore Database Literature Review Concerning Internet of Everything During 2020-2021**
14:00-	77	Afshin Balal, Miguel Herrera, Yao Lung Chuang and Shahab Balali. **Analysis of Buck, Boost,**

14:15		and Flyback Topologies Using for Active Power Factor Correction
14:15-14:30	82	Muhammad Mahreza Maulana, Arif Imam Suroso, Yani Nurhadryani and Kudang Boro Seminar. **Smart Governance Design for One-Stop Government of Licensing Services in Bio-business**
14:30-14:45	94	M Habib Ullah, Jasim Uddin and Syed Zahurul Islam. **Ultra-Low Profile, Compact Quasi-Yagi Antenna Suitable for IoT Application**
14:45-15:00	128	Maged Rfeqallah and Mohammed A. Al-Sharafi. **Conceptualizing a Model for Using Social Media as a Learning Tool and Its Effect on Academic Performance: The Moderating Effect of Self-Regulation**
15:00-15:15	129	Redhwan Al-Amri, Shuhd Al-Shami, Hussein Mohammed Esmail Abualrejal, Mohammed A. Al-Sharafi and Tareq Khaled Yahya Alormuza. **Role of Shariah compliance on Cryptocurrency Acceptance among Malaysians: An Empirical Study**
13:45-15:15	**Session 1C: Parallel Session** **Location:** CDC2 Hall **Google Meet:** https://meet.google.com/reh-ctcd-sdx **Track:** Embedded Computing and Cyber-Physical Systems for the IoE (EC-CPS-IoE)+ Intelligent Technologies for Internet of Everything (IT-IoE) *Chaired by:* Assoc. Prof. Dr. Abdullatif Ghalab *Co-chaired by:* Dr. Walid Shaher Yousef *Technician:* Mr. Abdulnaser Alabbadi	
	ID	**Paper Title**
13:45-14:00	39	Pouria Khanzadi, Shirin Kordnoori, Zahra Vasigh, Hamidreza Mostafaei and Ehsan Akhtarkavan. **A Cyber Physical System based Stochastic Process Language With NuSMV Model Checker**
14:00-14:15	90	Belal Al-Fuhaidi, Wedad Al-Sorori, Naseebah Maqtary, Abdullah Al-Hashedi and Sadiq Al-Taweel. **Literature Review on Cyber Attacks Detection and Prevention Schemes**
14:15-14:30	130	Israa A. Aljabr, Ghaida A. Al-Suhail and Waheb A. Jabbar. **A Fuzzy GPSR Route Selection Based on Link Quality and Neighbor Node in VANET**
14:30-14:45	8	Mustafa Aldarraji, Mohammed Abood, Mustafa Maad Hamdi, Ratna Kalos Sahbudin and Isam Thajeel. **Study the effect of the Stimulated Raman Scattering (SRS) in optical fiber-based on OptiSystem**
14:45-15:00	17	Mohammed Al-Shahethi, Amgad Muneer, Ebrahim Ghaleb, Sam Darshi and Akram A. Almohammedi. **Real Life Monitoring of Conveyor Line Speed Using IoT and Raspberry Pi**
15:00-15:15	18	Sabri Al-Shaibany, Akram Almohammedi, Vladimir Shepelev, Sam Darshi, Abdulmalek Al-Hemyari, Abdaladeem Alsharaby, Abdulmalek Abdullah, Abdullatif Alhadry and Ezzadeen Alomary. **Mobility-based Enhancement for Channel Coordination of IEEE 802.11p on Vehicular Ad-hoc Networks Over V2I**

Day2:   **Tuesday, November 2nd**   **Time Zone: GMT+3**

Webinar - Zoom Link: https://us02web.zoom.us/j/83917774510?pwd=TlhKeis3MDBjaEx2R2Y0bnlNQU5yUT09
Passcode: 123456

Facebook LIVE: https://www.facebook.com/itssioe2021
https://www.facebook.com/www.ust.edu.ye
YouTube Live: https://bit.ly/ustyemen1994

08:00-08:30	**Location: Auditorium Session**	Conference Registration and Participation Arrival
08:30-09:10		Keynote Speech 4 by: *Dr. Md Zakirul Alam Bhuiyan*, Fordham University, **USA** Title: "Is Your Smartphone Smart Enough to Prevent You from Being Watching Through its Wi-Fi: An Up-and-Coming Security Concerns".
09:10-09:50		Keynote Speech 5 by: *Dr. Reyad Mehfuz*, Staff R&D Engineer, Seagate Technology, **UK**. Title: HAMR Technology: The Future of Data Storage
09:50-10:00		***Break Session***

10:00-11:55	**Session 2A: Parallel Session** **Location:** Auditorium
	Webinar - Zoom Link: https://us02web.zoom.us/j/83917774510?pwd=TlhKeis3MDBjaEx2R2Y0bnlNQU5yUT09 ,Passcode: 123456 Track: Artificial Intelligence and Decision-making using IoE Technology (AI-IoE) *Chaired by: Assoc. Prof. Dr. Belal Al-Fuhaidi* *Co-chaired by: Assoc. Prof. Dr. Abdullatif Ghalab* *Technician: Mr. Mohamed Mahyob, Mr. Mobarak Alamry*

	ID	Paper Title
10:00-10:15	66	Jatin Aditya. **Optimized Ensemble Prediction Model for Breast Cancer**
10:15-10:30	88	Arian Yousefiankalareh, Taraneh Kamyab, Farzad Shahabi, Ehsan Salajegheh, Hossein Mirzanezhad and Mahsa Madadi Masouleh. **Face recognition based on sparse coding using support vector machine classifier**
10:30-10:45	89	Hossein Mirzanejad, Ehsan Salajegheh, Farzad Shahabi, Arian Yousefiankalareh, Shahab Balali and Shahaboddin Seddighi. **Optimizing Consensus of Higher-Order Heterogeneous Linear Multiagent Systems**
10:45-11:00	22	Vivine Nurcahyawati and Zuriani Mustaffa. **Feature Selection based on Particle Swarm Optimization Algorithm for Sentiment Analysis Classification**
11:00-11:15	102	Shubhnoor Gill, Neha Sharma, Chetan Gupta and Argha Samanta. **Attendance Management System Using Facial Recognition and Image Augmentation Technique**
11:15-11:30	105	Gurjot Singh Sodhi and Jasjot Singh Sodhi. **A Robust Invariant Image-Based Paper- Currency Recognition Based On F-KNN**
11:30-11:45	110	Dr. Shikha Gupta, Dipra Mitra and Pavandeep Kaur. **An Algorithmic Approach to Machine Learning Techniques for Fraud detection: A Comparative Analysis**

10:00-11:55	**Session 2B: Parallel Session** **Location:** CDC1 Hall
	Google Meet: https://meet.google.com/rcb-awja-ajr Track: Internet of Things and Intelligent Data Analytics for Internet of Everything (IoT-IDA-IoE) + Emerging Application of IoE (EA-IoE) *Chaired by: Assoc. Prof. Dr. Sadik Al-taweel* *Co-chaired by: Dr. Gawed Alhammadi* *Technician: Mr. Ahmed Abdulqader*

	ID	Paper Title
10:00-10:15	27	Liwa Al-Farhani. **Improved Energy Efficient Sleep Awake Aware Sensor Network Routing Protocol**
10:15-10:30	21	Taha Rassem. **A New Wavelet Completed Local Ternary Count (WCLTC) for Image Classification**

	ID	Paper Title
10:30-10:45	54	Jitender Singh and Surender Singh. **Automatic Image Alignment and Fusion in a Digital Photomontage**
10:45-11:00	72	G.Rajesh, A.Pooja, R.Janani, R.V.Kamalesh Kumar and P.Lakshmi Harika. **Latency Reduction in Multipath TCP using ESTTF Scheduling Algorithm**
11:00-11:15	73	Abdulrahman A Alsewari. **Nomadic People Optimizer for IoT Combinatorial Testing Problem**
11:15-11:30	79	Sarah Talal, Walid S. M. Yousef and Belal Al-Fuhaidi. **Computation Offloading Algorithms In Vehicular Edge Computing Environment: A Survey**
11:30-11:45	81	Hussein J. Khadim, Faik K. Obaed and Ziad T Abd Ali. **Application of MQ-Sensors to Indoor Air Quality Monitoring in Lab based on IoT**
10:00-11:55		**Session 2C: Parallel Session** **Location:** CDC2 Hall **Google Meet:** https://meet.google.com/puf-vtxv-grd **Track:** Embedded Computing and Cyber-Physical Systems for the IoE (EC-CPS-IoE)+ Intelligent Technologies for Internet of Everything (IT-IoE) *Chaired by: Assoc. Prof. Dr. Abdulrahman Alsewari & Dr. Walid Shaher Yousef* *Co-chaired by: Dr. Wedad Al-Sorori* *Technician: Mr. Abdulnaser Alabbadi*
	ID	**Paper Title**
10:00-10:15	10	Fahd Alqasemi, Salah Alhagree, Baligh Al-Helali, Nail Adeeb Ali Abdu and Ghaleb Al-Gaphari. **Arabic Poetry Meter Categorization Using Machine Learning Based on Customized Feature Extraction**
10:15-10:30	19	Ragad Tawafak, Abdulrahman Alsewari, Sohail Iqbal and Ghaliya Alfarsi. **A Tool Model Group (TMG) Development to Enhance Student Performance**
10:30-10:45	30	Nawaf Al Jubory and Ban Muhammed. **Ransomware Threat Detection using Machine Learning Techinques**
10:45-11:00	67	Azhar Kassem Flayeh, Azmi Shawkat Abdulbaqi and Ismail Yusuf Panessai. **A Secure EEG Simulator for Remote Healthcare Evaluation**
11:00-11:15	76	Salah Alhagree, Fahd Alqasemi, Ibrahim Alnedami and Redwan Al-Dilami. **Time Series Forecasting for Clients Rates in Tele-Communication Data using Statistical Techniques**
11:15-11:30	107	Akwinder Kaur. **Cloud Based Surveillance using ESP32 CAM**
11:30-11:45	131	Abdullatif Ghallab, Ali Almuzaiqer, Abdullah Al-Hashedi, Kamal Bechkoum, Abdulqader Mohsen and Wajdi Aljedaani. **Factors Affecting Intention to Adopt Open Source ERP Systems by SMEs in Yemen**
11:55-12:15	**Location: Auditorium Session**	E-Learning Speech by: ***Assoc. Prof. Dr. Abdullah Alhashedi***, vice-chair of Deanship of E-Learning and Distance Education, University of Science and Technology, Yemen **Title**: E-Learning: Challenges and Requirements.
12:15-12:35		Scientific Research Speech by: ***Prof. Dr. Mohamed Mahdi***, Head of Scientific Research Department, Deanship of Postgraduate Studies and Scientific Research, University of Science and Technology, Yemen
12:35-13:30		*Break Session*
13:30-15:00	**Location: Auditorium Session**	**CLOSING CEREMONY** (Closing Speech, Scientific Research Award, Announcement of Best Paper Award and Certificates)
		END OF DAY 2

CONFERENCE ABSTRACT

PARALLEL SESSION I

SESSION 1A:Artificial Intelligence and Decision-making Using IoE Technology (AI-IoE)

PAPER ID: 12

Using Ontology to Enhance Decision-Making for Product Sustainability in Smart Manufacturing

[1]Moseed Mohammed, [2]Awanis Romli and [3]Rozlina Mohamed

[1-3]University Malaysia Pahang UMP

Smart manufacturing is widely focused on sustainable development at the industrial level. Lack of knowledge use in smart manufacturing limits the ability to assess, share, and reuse knowledge by decision-makers. The goal is to enable decision-makers to use sustainability information relevant to life cycle sustainability assessment techniques based on ontology at the design stage by facilitating the assessment, share, and reuse of knowledge. In this paper, we present the material and process selection tools and illustrate their application in promoting reusability in manufacturing. It is expected that this study will contribute to solving the problem of lack of information sharing and providing high-quality and comprehensive recommendations for supporting the processes of smart manufacturing.

Keywords: Ontology, decision-making, sustainability, inferenc, manufacturing

Sentiment Analysis Towards Feelings Among Covid-19 Outbreak Using Single and Ensemble Classifiers

[1]Wedad Al-Sorori, [2]Abdulqader M. Mohsen, [3]Yousef Ali, [4]Naseebah A. Maqtary, [5]Asma M. Altabeeb, [6]Belal Al-Fuhaidi, [7]Abdullah Alhashedi and [8]Hasan Ali Gamal Al-Kaf.

[1-8]University of Science and Technology

Abstract

The pandemics change many details of daily life for humans over time. The most prominent example we have seen today is the emergence of the Corona virus (COVID-19), as it posed many challenges to the health sector and governments. The need to study and analyze public opinions about the pandemic or about those preventive measures that are imposed, led to the emergence of many studies. These conducted studies have concerned the analysis of public feelings and opinions, known as sentiment analysis (SA). Taking a benefit of massive increase of online content in social media platforms such as Twitter makes SA available and applicable. Thus, it motivated the researchers to survey the Arabic content of social media that express the Arab people feelings, especially fear and anxiety, towards Covid-19. This motivation was achieved through a machine learning (ML) model that analyzes and categorizes the tweets related to fear and anxiety regarding Covid-19 outbreak. In this model, the word2vec was employed for word embedding to form the vector of features with two CBOW pre-trained models CC.AR.300 and Arabic news. Moreover, the effect of the sampling technique that is called Synthetic Minority Over-sampling Technique and Edited Nearest Neighbors (SMOTENN) was investigated in this study. In addition, the performance of several single-based and ensemble classifiers were evaluated and discussed. The experimental results show that applying word embedding and SMOTENN with both single and ensemble classifiers achieve a good improvement in terms of F1 average score compared to the baseline, single and ensemble classifiers without SMOTENN.

Keywords: Coronavirus, NLP, Machine learning, Fear, Social Platforms, Arabic

Optimization of Energy-Efficient Cloud Radio Access Networks for 5G using Neural Networks

[1]Maha Fathy1, [2]Mohamed Salah Abood and [3]Mustafa Maad Hamdi
[1,2] Beijing Institute of Technology, [3] Al-Maarif University College

Abstract

Since proposed, Cloud Radio Access Network (Cloud-RAN) gives a committed architecture suitable for fulfilling 5G networks' applications. Cloud-RAN can solve challenges related to ever-evolving networks' mobile operators and an ever-growing number of end-users. Cloud-RAN architecture maintains both profitability and quality of service (QoS). In this paper, power consumption is jointly formulated as power minimization beamforming and RRHs selection problem. Using the conventional convex or heuristic optimization approaches to find optimal solutions is highly complex; hence, we introduce an Artificial Neural Network (ANN) - based optimization model that aims to optimize the active Remote Radio Heads (RRHs) numbers in remote network sites and the consumed power. The proposed model considers various signal to interference plus noise ratios per client and power consumption models. Specifically, the model uses an adopted Bi-Section Group Sparse Beamforming (GSBF) optimization algorithm to reach near optimum solutions. Obtained validated results encourage machine learning techniques to reduce both the complexity and power consumption in such an emerging area.

Keywords: Artificial Neural Network (ANN), Cloud Radio Access Network (Cloud-RAN), Group Sparse Beamforming, Remote Radio Heads (RRHs) optimization

PAPER ID: 28

BERT-based Text Simplification Approach to Reduce Linguistic Complexity of Bangla Language

[1]Nahid Hossain and [2]Adil Ahnaf

[1,2]United International University

Abstract

The text simplification approach simplifies the linguistic complexity of a particular language so that the grammar and structure of a language are greatly simplified to read and understand while preserving the information and underlying meaning. Despite being spoken globally and having a rich history of Bangla literature, there is no work has been done in the Bangla language on this important topic. The work has been done to increase the number of Bangla literature readers and save Bangla historical writings from becoming extinct. We have also collected and used an extensive corpus consisting of 1,52,230 sentences along with a lexicon consisting of 22,580 complex-simple unique word pairs, which are mapped manually. This paper has presented two text simplification models based on Long Short Term Memory (LSTM) and Bidirectional Encoder Representations from Transformers (BERT). However, the proposed model based on BERT shows a satisfactory accuracy rate of 95.3%.

Keywords: Bangla, Text Simplification, Linguistic Complexity, LSTM, BERT

PAPER ID: 29

Web-based AI-IoT Multi Classifiers Model of IRIS Images in Real Live Farm Field

[1]Wafaa Ali, [2]Ali Abdulredah and [3]Ali Dakhil

[1]University of Thi-Qar, [2,3]University of Sumer

Abstract

Combining AI model and IoT devices in the farm and agriculture field would lead for best desired productivity. IoT enabled cameras significantly help to collect flowers images in real-time in the farm. Classifying large dataset of flowers images with multi species need a dedicated and sufficient AI model. The purpose of those captured images is to transfer their features into numerical values as what the common IRIS dataset looks like. So, eventually, engineers can have IRIS attributes from its original images. This research investigates a perfect solution to extract the most relative features from the collected images. Those features represent the four attributes of the IRIS flowers; Sepal width and height, also Petal width and height. The applied methodology is a Conventional Neural Network model with four different architectures; GoogLeNet, VGG-16, AlexNet, and ResNet-50. These models would extract features of image and then select the most efficient ones. Also, the proposed methodology, at the last step, uses multi-classifiers with nine algorithms to have the best outcome result. Experiments have proved that SVM has accuracy with 98.89% of classifying the selected features. Meanwhile, the nine algorithms classify the IRIS species by voting technique which reached 97% of classification performance. Also, the results have shown that large IRIS dataset leverages into best accuracy, however, almost all classifiers algorithms having close accuracy results and mercies performance.

Keywords: AI, IoT, IRIS, dataset, flowers, CNN, features, selection, classification, multi model, cloud, web-based

PAPER ID: 38

Hybrid Neural Network for Handwritten Mathematical Expression Recognition system

[1]G.Rajesh, [1]Rishikesh Narayanan Ramachandran, [1]Karthik Srivatsan Vaidyanathan, [1]Parthiban Suresh and [2]X.Mercilin Raajini

[1-4]MIT campus, Anna University, [5]Prince Shri Venkateshwara Padmavati engineering college

Abstract

The mathematical expression recognition system helps in the easy understanding of handwritten mathematical expressions. It can also be used for converting handwritten documents into digital documents. It can detect an individual's mental issues or moods, such as when a user is angry or unwilling to write, the user's handwriting is entirely or partially incomprehensible. However, when a person is happy or working dedicately then the user's writing is clear. New hybrid neural network algorithms like CRNN in which the CNN and RNN were combined. It has been showing better and more accurate outputs than the native CNN and RNN algorithms alone. CROHME dataset is used, which is the most widely used dataset. The recognition is divided into 4parts tracker, validator, attention, and parser (VTAP). A tracker is equipped with a group of Bi-Directional Recurrent Network (BRNN) with the Gated Recurrent Unit (GRU). Succeeded by a tracker, the parser uses a GRU lead by guided hybrid attention. The accuracy and the time complexity of VTAP is compared with existing work Tracker, Attention and Parser (TAP), VTAP shows up to 92.2% of accuracy while TAP shows an accuracy of 89%.

Keywords: Bi-Directional Recurrent Neural Network (BRNN), Gated Recurrent Unit (GRU), Fully Convolutional Network (FCN), Handwritten Mathematical Expression Recognition system

SESSION 1B: Internet of Things and Intelligent Data Analytics for Internet of Everything (IoT-IDA-IoE) + Emerging Application of IoE (EA-IoE)

PAPER ID: 44

An IEEE Xplore Database Literature Review Concerning Internet of Everything During 2020-2021

[1]Fahd Alqasemi1, [2]Salah Alhagree, [3]Ammar Zahary and [4]Redhwan Shaddad

[1]University of Science and Technology, Yemen, [2]ibb unversity2, [3]Sana'a University, [4]Taiz University

Abstract

For communication and computing sciences researchers, Internet of Everything (IoE) is one of the most attractive topics. It is the field that represents the interconnection between internet of things (IoT) and people's need for several kinds of technological services. Thus, some literature considers the modern ages as the IoE era. Smart city, 5G, and 6G become part of IoE vocabularies list, besides many techniques and applications that have been utilized by researchers for conducting IoE business and academic projects. In this study, IoE directions have been explored, so papers that have IoE in IEEE Xplore's indexed terms have been investigated. Retrieved papers have been categorized and systematically reviewed. Diverse perspectives have been studied statistically, presented visually, and papers' directions are reviewed carefully. The relations between categories have been counted and available information about the IoE world is introduced, the main goal was discovering IoE methods and applications, that have been presented from 2020 to 2021.

Keywords: Internet of Everything (IoE), Internet of Things (IoT), Internet of Anything (IoA)

PAPER ID: 77

Analysis of Buck, Boost, and Flyback Topologies Using for Active Power Factor Correction

[1]Afshin Balal, Miguel Herrera, [2]Yao Lung Chuang and [3]Shahab Balali

[1,2]Texas Tech University, [3]Azad university of Tehran

Abstract

Rectifier circuits which are made up of diodes are used in quite a few applications including Uninterrupted Power Supply (UPS), adjustable speed drive, Switch Mode Power Supply (SMPS), and battery energy storages in order to convert ac to dc power. However, low power factor which causes high current harmonics, is the major disadvantage of this diode rectifier. The need for high-power components with low total harmonic distortion (THD) and high PF is growing. The goal of this article is to investigate three techniques for achieving a PF close to one utilizing buck, boost, and flyback topologies as active power factor correction APFC methods.

Keywords: DC Power Supply, Power Factor Correction (PFC), Buck Converter, Flyback Converter, Boost Converter

PAPER ID: 82

Smart Governance Design for One-Stop Government of Licensing Services in Bio-business

[1]Muhammad Mahreza Maulana, [2]Arif Imam Suroso, [3]Yani Nurhadryani and [4]Kudang Boro Seminar

[1]Computer Science Department, IPB University, [2]School of Business, IPB University, [3]Computer Science Department3, IPB University and [4]Faculty of Agricultural Technology, IPB University

Abstract

One of smart city's components is smart governance that includes transparent government, public participation and public services. The integration of public services is called one-stop government. Service integration between local and central government and several services among government institutions are very challenging. Recently exploration on the various components of smart city governance does not have system recognition. The objective of this study is to design the smart governance framework on one-stop-shop service. Smart governance design has been proposed to achieve the objectives of one-stop-shop services. Several IT governance frameworks were used as the best practices to make alignment between government targets and IT solutions. Integration of mainly the common elements of each framework were required. The framework has four smart-governance domains include four EA processes, eleven COBIT5 processes, fifteen ITILv3 processes with three proposed KPI recommendations per domain. Smart-governance begins with the design of Enterprise Architecture. Then targets are set per domain and the processes that support it.

Keywords: Smart Governance, Smart City, One-Stop-Shop Services, IT Governance, Smart System, Framework

International Conference
on Intelligent Technology System and Service for
Internet of Everything

REPUBLIC OF YEMEN

University of Science and Technology

PAPER ID: 94

Ultra-Low Profile, Compact Quasi-Yagi Antenna Suitable for IoT Application

[1]M Habib Ullah, [2]Jasim Uddin and [3]Syed Zahurul Islam

[1]University of Malaya, [2]Cardiff Metropolitan University and [3]Universiti Tun Hussein Onn Malaysia

Abstract

The ultra-low-profile dual-band planar quasi-yagi (QY) antenna is proposed and investigated their bandwidth as well as gain characteristics which suitable for IoT application. The special characteristics of this antenna are encompassed $0.17\lambda \times 0.13\lambda$ radiating patch, as well as the ground plane, which has been reduced. The substrates comprise manually copper laminated thickness 1.25 mm and dielectric substrate εr is 4.5. Measurement results of input ports return loss (S11) represent the high peak of dual-band 27.78% from 0.8 GHz to 1.05 GHz and 23.4% obtained from 2.1 GHz to 2.65 GHz. The antennas maximum gain found 4.95 dBi and 7.26 dBi in correspondence to the lower and upper band, respectively. Excellent performance horizontal polarized broadside radiation characteristics with proper impedance matching, improve gain assures the proposed antenna promising candidate for IoT applications.

Keywords: Quasi Yagi Antenna, RFID, WLAN, Dual Band

PAPER ID: 128

Conceptualizing a Model for Using Social Media as a Learning Tool and Its Effect on Academic Performance: The Moderating Effect of Self-Regulation

[1]Maged Rfeqallah and [2]Mohammed A. Al-Sharafi

[1]Universiti Tun Hussein Onn Malaysia and [2]Universiti Teknologi Malaysia

Abstract

Social media has attracted considerable attention from students at higher level of educational pursuit and has become an important communication tool that enables rapid information exchange, connects with friends, and instructs and influences their academic performance. Students are prone to the effect of social media as they usually spend more time using social sites without proper monitoring from their parents, which affects their academic endeavors. This goal of this study is to propose a theoretical model for investigating the impact of social media usage on students' academic performance. The proposed model has been developed by extending the Technology Acceptance Model theory with communication theory factors (motivation and perceived ease of communication) that consider the real motivation factors to accept and use new technologies. In addition, this study explores the effect of self-regulation as the moderating variable in the relationship between social media use and academic performance. This study provides comprehensive findings and insights of social media use among universities, researchers, and students and the extent to which academic performance is influenced by the use of social media. Furthermore, the proposed model must be tested in future studies.

Keywords: Social media sites, academic performance, higher education institution, self-regulation

PAPER ID: 129

Role of Shariah compliance on Cryptocurrency Acceptance among Malaysians: An Empirical Study

[1]Redhwan Al-Amri, [2]Shuhd Al-Shami, [3]Hussein Mohammed Esmail Abualrejal, [4]Mohammed A. Al-Sharafi and [5]Tareq Khaled Yahya Alormuza

[1]Taylor's University, [2]MAHSA University, [3]University Utara Malaysia, Sintok, [4]Universiti Teknologi Malaysia and [5]University Utara Malaysia

Abstract

Cryptocurrency is the first successful application of blockchain technology that represents a breakthrough in the financial industry. Cryptocurrencies are decentralized currencies with no central issuer, allowing users to perform transactions, such as virtual payment for goods and services and fund transfer with low fees independently and effectively by utilizing blockchain platforms to ensure the legitimacy and validity of the transactions conducted. However, the acceptance rate of cryptocurrency globally and in Malaysia, is not at the desired level because of consumers' concerns such as Shariah compliance. Therefore, this paper attempts to examine user perception of the acceptance of the cryptocurrency system application from the Shariah perspectives. UTAUT is utilized in this paper, together with a Shariah compliance integration to formulate and evaluate various hypotheses that would establish the proposed conceptual model. The study used a sample of 496 persons. The hypothesis testing revealed that Performance Expectancy, Effort Expectancy, Social Influence, and Shariah compliance all affect behavioral intention to adopt cryptocurrency from a Shariah perspective in Malaysia.

Keywords: Cryptocurrency, Acceptance, UTAUT, Shariah Compliance, Blockchain

SESSION 1C: Embedded Computing and Cyber-Physical Systems for the IoE (EC-CPS-IoE) + Intelligent Technologies for Internet of Everything (IT-IoE)

PAPER ID: 39

A Cyber Physical System based Stochastic Process Language With NuSMV Model Checker

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Abstract

Nowadays, cyber physical systems are playing an important role in human life in which they provide features that make interactions between human and machine easier. To design and analysis such systems, the main problem is their complexity. In this paper, we propose a description language for cyber physical systems based on stochastic processes. The proposed language is called SPDL (Stochastic Description Process Language). For designing SPDL, two main parts are considered for Cyber Physical Systems (CSP): embedded systems and physical environment. Then these parts are defined as stochastic processes and CPS is defined as a tuple. Syntax and semantics of SPDL are stated based on the proposed definition. Also, the semantics are defined as by set theory. For implementation of SPDL, dependencies between words of a requirements are extracted as a tree data structure. Based on the dependencies, SPDL is used for describing the CPS. Also, a lexical analyzer and a parser based on a defined BNF grammar for SPDL is designed and implemented. Finally, SPDL of CPS is transformed to NuSMV which is a symbolic model checker. The Experimental results show that SPDL is capable of describing cyber physical systems by natural language.

Keywords: Description Language, Stochastic Process, Model Checking, Cyber Physical Systems

PAPER ID: 90

Literature Review on Cyber Attacks Detection and Prevention Schemes

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Abstract

Due to the tremendous development in the field of information and communication technology (ICT) and its continuous connection with the Internet, the data of customers and companies has become under the threat of electronic attacks, so it has become necessary to clarify solutions to ensure the security and safety of data around the world. In the modern era, it has become imperative for countries and large companies to adopt cybersecurity systems in their systems, to ensure the confidentiality and security of data from cyber-attacks. This paper provides an overall review of previous studies on cyber-attacks and cybersecurity with the aim of understanding the concept of cyber-attacks, different forms of cyber-attacks as well as cyber-attack mitigation strategies.

Keywords: Cybersecurity, defensive and offensive strategies, privacy, authentication, security threats

A Fuzzy GPSR Route Selection Based on Link Quality and Neighbor Node in VANET

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Abstract

The increasing number of automobiles in the past decade makes the street an unsafe place for the driver, this makes the idea of developing a vehicle that knows the road and can communicate with other vehicles for information to reduce the accident very crucial thought. VANET was introduced to solve that problem, but VANET faced many problems one of these problems is routing. This paper suggests an effective intelligent fuzzy logic control system; called the FL-QN GPSR routing protocol. The proposed routing protocol incorporates two metrics link quality, and neighbor node to detect the best next-hop node for a packet forwarding and alter the beacon message by adding a new field called the direction to be more suitable to our simulation and for more accuracy for choosing the shortest and the fittest path to the destination. This work is done using the network simulator OMNeT++ along with the mobility simulator SUMO. The obtained results of the simulation are done using different experiments to show the strength of the suggested protocol compared to the AODV and GPSR in urban environments which indicate substantial improvements in the network performance concerning packet delivery ratio, packet drop ratio, end-to-end delay, and throughput.

Keywords: FL-QN GPSR, Intelligent Systems, OMNeT++, SUMO, QoS, VANET

Study the effect of the Stimulated Raman Scattering (SRS) in optical fiber-based on OptiSystem

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Abstract

Stimulated Raman Scattering (SRS) is a phenomenon induced by light's contact with the material of the optical fibers which leads to shifting to sundry frequencies, therefore it is extremely important to discuss and focus on this phenomenon in the field of optical fibers. By using an optical fiber communication simulation comprehensive tool software called OptiSystem, the findings show that by using the provided tools and configurations in the OptiSystem simulation model, It can be possible to create and simulate Stimulated Raman Scattering (SRS) separate channels and analyze and assess the yield and actions of this phenomenon

Keywords: Stimulated Raman Scattering (SRS), OptiSystem, simulation, fiber optic

PAPER ID: 17

Real Life Monitoring of Conveyor Line Speed Using IoT and Raspberry Pi

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Abstract

Manual monitoring is time-consuming and frustrates the industry with high costs and delays in the process. In this study, we presented a remote monitoring system for a DC motor based on IoT for safe and economic data communication in industrial fields. A single sensor monitors the DC motor speed and sends it to the Raspberry Pi microcontroller, which sends it to the cloud database for remote monitoring. The system also presents the manual control methods to adjust the motor speed using a simple potentiometer. Therefore, the proposed system has three functions: measuring, monitoring, and controlling. Measuring is based on an optoisolator sensor and an Arduino Mega microcontroller. Controlling is based on the Potentiometer, Arduino Uno, and a Motor Drive circuit. Monitoring is based on Raspberry Pi and ThingSpeak platform. Firstly, the speed sensor HC-020K senses the speed Data. Secondly, Arduino Mega extracts the HC-020K sensor's data as a suitable revolution per minute and sends it to Raspberry Pi. Thirdly, Raspberry Pi sends the data to ThingSpeak's Server. Lastly, based on the experiments performed, the system has proved to be very useful and reliable.

Keywords: Raspberry Pi, IoT, IR sensor, Conveyer line, Data transmission, ThingSpeak

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PAPER ID: 18

Mobility-based Enhancement for Channel Coordination of IEEE 802.11p on Vehicular Ad-hoc Networks Over V2I

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Abstract

Vehicular Ad-Hoc Networks (VANETs) are a sub form of Mobile Ad-Hoc Network that provide communication among vehicles (V2V) and vehicles to infrastructure (V2I). VANETs have been developed to offer reliable and efficient services on the roads. These services can include safety applications (collision warning), and non-safety applications (video and voice). The IEEE 802.11p is an extension of the IEEE 802.11 standard to support wireless access into vehicular environments. However, the IEEE 802.11p standard does not perform well for VANETs under high traffic load and mobility. The is owing to the nature of contention-based channel access mechanism in IEEE 802.11p sharing a common radio frequency. The work in this paper presents a new scheme to improve the channel access coordination of 802.11p for V2I communication under high traffic and mobility. This scheme adaptively adjusts the contention window (CW) based on the times (deadlines) that the vehicles are about to exit the Road-Side Unit (RSU) coverage area. Priority service is given to vehicles with shorter deadlines and vice versa. The Network Simulator (NS-2) v.2.35 is used for simulation. According to simulation results, our proposed scheme outperforms the existing scheme in terms of throughput, packet loss ratio and packet delivery.

Keywords: VANETs, V2I, IEEE 802.11p, Channel Coordination, Throughput

PARALLEL SESSION II

SESSION 2A: Artificial Intelligence and Decision-making Using IoE Technology (AI-IoE)

PAPER ID: 66

Optimized Ensemble Prediction Model for Breast Cancer
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Abstract

Breast cancer among women has been accounted as one of the most common cancers. Early detection of this cancer is essential in providing aid for further medical treatments. This study focuses on automated breast cancer prediction using machine learning. Supervised learning algorithms are good at performing the task of searching through a hypothesis space to find a suitable hypothesis that will make good predictions with a particular problem. Even if the hypothesis space contains hypotheses that are very well-suited for a particular problem, it may be very difficult to find a good one. Ensembles combine multiple predictions to form a better hypothesis. The term ensemble is usually reserved for methods that generate multiple hypotheses using the same base learner or a different one. Evaluating the prediction of an ensemble typically requires more computation than evaluating the prediction of a single model. Unlike bagging or boosting, in this project we are trying the same to predict whether the breast cancer is cancerous or not that is, malignant or benign using GaussianNB as meta classifier in stacking classifier of scikit learn in python and we are using breast cancer dataset from Wisconsin, maintained by University of California. The recorded prediction was achieved to be 99.41% which outperforms the performance of single algorithm.

Keywords: Breast cancer, Ensemble Model, Stack Generalization

PAPER ID:88

Face recognition based on sparse coding using support vector machine classifier
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Abstract

In this paper, a system for face detection based on the generalized BOW method is proposed. We have utilized the space pyramid matching (SPM) method to overcome the neglected problem of space order of BOW. In the feature extraction stage, we have used SIFT method which is resistant against local variations. Sparse presentations usually are linearly separable; hence in the proposed system, we have utilized the sparse codding method in the feature learning stage. In the polling stage, we have used maximum polling operation to reach a unified vector from multiple descriptor vectors. Finally, a support vector machine classifier is used to classify face descriptor vectors. Simulation results show high accuracy of classification (ACC=0.9952) and its resistivity against previous methods.

Keywords: SIFT, sparse codding, support vector machine, maximum polling, space pyramid matching

PAPER ID:89

Optimizing Consensus of Higher-Order Heterogeneous Linear Multiagent Systems

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Abstract

This paper utilizes an optimum control theory based on LQR to optimize a cooperative control law that ensures the consensus of linear agents' outputs. In the beginning, we study the consensus problem of higher-order heterogeneous linear networks. Then we will provide an analytic solution for the partial optimization problem of closed-loop cooperative systems consensus. Optimum control of multiagent systems has some complications. Since network dynamic is dependent on network graph topology and network topology should exist in optimum solution, then we utilize the reverse optimization method.

Keywords: consensus, Reverse optimized control, cooperative control

PAPER ID: 22

Feature Selection based on Particle Swarm Optimization Algorithm for Sentiment Analysis Classification

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Abstract

Currently, online media is a potential secondary data source for sentiment analysis research material. The current conditions of data sources are very diverse. It also presents a variety of writing systems. Therefore, the results of accuracy in sentiment analysis become the main thing. This paper proposed an improved approach to increase the sentiment analysis accuracy based on text pre-processing and Naïve Bayes Classifier (NBC) algorithm hybrid with Particle Swarm Optimization (PSO) (NBC-PSO). The proposed algorithm solves the complex background problems about noise data and feature selection that affect the classification performance on sentiment analysis. This study applies data pre-processing to minimize data noise and process the review data in an unstructured format until it becomes more structured. Then, it is further proceeded with classification on positive or negative sentiments on these texts using NBC. Later, the feature selection based on PSO is made to improve the accuracy results. Experimental results show that the proposed approach has a significant effect on sentiment score and polarity detection.

Keywords: sentiment analysis, naïve bayes classifier, particle swarm optimization, text pre-processing

PAPER ID: 102

Attendance Management System Using Facial Recognition and Image Augmentation Technique

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[1-4]Chandigarh University

Abstract

Over decades the attendance of students has been taken using methods involving paper. The limitations of this method are widely known and clearly understood, it is time- consuming, prone to errors and there is always a chance of proxy attendance. Many techniques that are implemented in today's time are vastly unreliable and are majorly inefficient, like biometrics and Radio Frequency Identification (RFID), more importantly when there is a pandemic that majorly spreads via touch. This clearly presents an opportunity in the field of facial feature detection and face recognition. We propose an effective and modish solution to mark attendance using the face recognition technique. The system will recognize the face of an individual or multiple students and compare them with the predefined face encodings to make a CSV file of attendees with their details. To create the database, we will use image augmentation techniques. This system can also be used to tackle the problem of fake attendance and proxies techniques.

Keywords: Face recognition, Attendance Management, Haar Cascade, local binary patterns histogram algorithm, Image Augmentation

A Robust Invariant Image-Based Paper- Currency Recognition Based On F-Knn

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Abstract

This paper presents a framework for automated currency notes recognition utilizing image processing strategies. The innovation of currency recognition intends to look, distinguish and remove the noticeable just as imperceptible subtleties on paper-money for effective classification of currency. Many a times, currency notes are hazy or harmed; a considerable lot of them have complex structures as well. This makes the assignment of currency recognition troublesome. Currency recognition is applied in order to diminish the human influence, put resources into this procedure. So it is essential to choose the correct highlights and legitimate calculation for this reason. This work is critical considering the mentioned dimensions. a) They got worn- out ahead of their schedule in comparison to coins; b) The possibility of joining wear-out currency is more noteworthy than that of coin currency; c) Coin currency is ristricted to lesser population. We have to actualize a calculation which should be straightforward, less mind-boggling and profoundly effective. Recognition of Paper-Currency is significant in the zone of pattern recognition. A framework for paper currency recognition is one sort of wise framework which is a significant need of the currency automation frameworks in the present current world.

Keywords: Currency, Decision tree, Fine-KNN, Image recognition, Receiver Operation Characteristic (ROC) curve, SVM

An Algorithmic Approach to Machine Learning Techniques for Fraud detection: A Comparative Analysis

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Abstract

Fraud using credit cards is still rife today, and the modes are increasingly varied. To avoid scams with various ways of credit cards, we must identify and find out what methods are often used by fraudsters. The comparative analysis depicts that the parameters, i.e. Precision/Recall and F1-Score the K-Nearest Neighbor, are better for detecting fraudulent transactions than the Logistic Regression and Naïve Bayes. However, the accuracy is marginal high of Logistic Regression, but the False Positive parameters cannot identify the imbalanced data; therefore, they disguise the results and accuracy of Logistic Regression and K--Nearest Neighbor deems fit for such cases. Kaggle Dataset for fraud detection has been used to experiment.

Keywords: Fraud Detection, Machine Learning, Naive Bayes, K-Nearest Neighbor, Logistic Regression

SESSION 2B: Internet of Things and Intelligent Data Analytics for Internet of Everything (IoE-IDA-IoE) +Emerging Application of IoE (EA-IoE)

PAPER ID: 27

Improved Energy Efficient Sleep Awake Aware Sensor Network Routing Protocol
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Abstract

Typically, in the smart city concept, a wireless sensor network contains a large number of power-constrained sensors. The sensors sensed data from the environment and transmit them towards the base station in a cooperative way. An efficient energy consumption strategy leads to extend the lifetime of wireless sensor networks. The clustering structure pattern is largely used to regulate the data transmission and reduce the total consumed energy. In this paper, we propose a new routing protocol that represents an improvement on Energy Efficient Sleep Awake Aware Sensor Network Routing Protocol (EESAA) called Improved –EESAA (I-EESAA) for heterogeneous wireless sensor networks (WSNs). I-EESAA protocol consists of many algorithms for clustering, cluster head selection, grouping, sensor mode scheduling, and data transmission. The main idea of I-EESAA is the grouping concept which aimed to form groups of sensors, which have the same application type and are located in the same communication range. After groups were formed, one sensor in each group will still in active mode while the others entered sleep mode. Simulation results show that I-EESAA protocol performs better than the DEEC, DEV-DEEC, and EESAA in the terms of network lifetime, first node dies, cluster head selection process, and throughput. Three system models are present to test I-EESAA with different environments.

Keywords: WSN, Sensors, Routing, Clustering, Pairing, Sleep Awake, Smart City

PAPER ID: 21

A New Wavelet Completed Local Ternary Count (WCLTC) for Image Classification
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Abstract

To overcome noise sensitivity and increase the discriminative quality of the Local Binary Pattern, a Completed Local Ternary Count (CLTC) was developed by combining the Local Ternary Pattern (LTP) with the Completed Local Binary Count (CLBC) (LBP). Furthermore, by integrating the proposed CLTC with the Redundant Discrete Wavelet Transform (RDWT) to construct a Wavelet Completed Local Ternary Count, the proposed CLTC's discriminative property is improved (WCLTC). As a result, more accurate local texture feature capture inside the RDWT domain is possible. The proposed WCLTC is utilised to perform texture and medical image classification tasks. The WCLTC performance is evaluated using two benchmark texture datasets, CUReT and Outex, as well as three medical picture databases, 2D Hela, VIRUS Texture, and BR datasets. With several of these datasets, the experimental findings demonstrate a remarkable classification accuracy. In several cases, the WCLTC performance outperformed the prior descriptions. With the 2D Hela, CUReT, and Virus datasets, the WCLTC achieves the highest classification accuracy of 96.91%, 97.04 percent, and 72.89%, respectively.

Keywords: Ontology, decision-making, sustainability, inferenc, manufacturing

Automatic Image Alignment and Fusion in a Digital Photomontage
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PAPER ID: 54

Abstract

A composite of several pictures is what we call a Photomontage or a collage. Having a large collection of photographs from an event, wedding, or trip is common these days. It is tedious to manually select meaningful images from the large collection of pictures to create a summary or storytelling montage. With the rapid development of computer vision algorithms, the modern digital world operates on automated and intelligent vision systems. Regular users highly demand these intelligent, automatic, and user-friendly systems. Our focus is to create an intelligent and user-friendly system that requires little to no manual work to create a digital photomontage. As a result, this paper describes the procedure of an automated digital photomontage web app. This system aims to construct an eye-pleasing image from a collection of input images without any effort. The system constructs a montage, also known as collage, of given images using several computer vision algorithms to identify each image's right placement. The algorithms involve saliency detection, face detection, smooth image-to-image transition, auto-orientation, and image-borders blending. The web app is available at **applink** and code is available at https://tinyurl.com/h4ccehrx. The proposed system is easy to use and provides high-quality results. This system is ideal for regular users to process images to share with their friends and family or social media profiles.

Keywords: Automatic, photo, image, montage, collage, image blending, fusion, auto image alignment, saliency detection

Latency Reduction in Multipath TCP using ESTTF Scheduling Algorithm
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PAPER ID: 72

Abstract

The Multipath Transmission Control Protocol(MPTCP) permits a TCP link to use many paths in order to optimize resource utilization and redundancy. In other words, MPTCP lets a single TCP session to be distributed over many paths (several TCP subflows) through multiple access networks. Multipath TCP's redundancy allows for resource inverse multiplexing, which improves TCP throughput by using all usable link- level channels rather than a solitary one by means of requirement for TCP. In datacenter environments, MPTCP also improves performance. Multipath TCP is capable of balancing a only one TCP connection to use various interfaces and achieving extremely great throughput. Multiple routes for incoming and outgoing network traffic exist in an asymmetric network. As a result, traffic entering and leaving the network follows a different path. MPTCP lacks a strong communication technique for asymmetric routes. MPTCP employs a modification of the Lowest-RTT- First (LRF) scheduler as its default scheduler. The proposed method employs the ESTTF (Efficient shortest transmission time first) scheduler. So the goal of MPTCP scheduler such as STTF is to provide a good user experience for some applications that are latency sensitive than the already existing scheduling algorithm such as LRF (Lowest RTT First),DAPS(Delay Aware Packet Scheduler),OTIAS(Out- of-order Transmission for In-order Arrival Scheduler) and ECF(Earliest Completion First) when interface quality is asymmetric. Finally, the Latency is reduced to 39.4%, and throughput is increased to 22.4% when ESTTF algorithm is used.

Keywords: MPTCP, Low latency, Scheduling, ESTTF, RTT, Subflow

PAPER ID: 73

Nomadic People Optimizer for IoT Combinatorial Testing Problem

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Abstract

Nowadays, smart cities depends on the integration between the systems via internet connections which are known as the Internet of Everything (IoE). The integrated systems raise several concerns involving the potential presence of critical integration defects. Therefore, there is a need for an interaction testing approach. In this paper, we present a Nomadic People Optimizer as a search engine for the test list generation for interaction testing. The proposed test list generation strategy is called Nomadic People Strategy (NPS). The results show the NPS is also capable of outperforming the existing strategies such as Algorithm (GA), Ant Colony Algorithm, Coco Search Algorithm (CS), Harmony Search Algorithm (HS), Jaya Algorithm, Firefly Algorithm and Melody Algorithm.

Keywords: Vehicular edge computing, Computation offloading, Vehicular networks

PAPER ID: 79

Computation Offloading Algorithms In Vehicular Edge Computing Environment: A Survey

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Abstract

Vehicular Edge Computing (VEC) is a promising paradigm that approximates the cloud services near vehicles with the assistance of offloading. Data and task offloading have aided vehicles to overcome their limited resources since that vehicles' applications are delay-sensitive and resource restrictions. The excessive dynamic nature of vehicular networks is the main challenge of task offloading in VEC. The constant changing of the network topology disconnects the wireless communication channels. Hence, putting an extra burden on exploring an optimal offloading scheme. Many studies consider the mobility issue, low latency, and resource utilization in the VEC environment. In this paper, we overview a variety of offloading schemes deployed in the VEC environment in the up-to-date state of the art by suggesting a new taxonomy of the offloading techniques.

Keywords: Vehicular edge computing, Computation offloading, Vehicular networks

PAPER ID: 81

Application of MQ-Sensors to Indoor Air Quality Monitoring in Lab based on IoT

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Abstract

Air pollution levels have been rising around the world in recent years. Long-term pollution exposure causes a variety of ailments, including lung disease, heart disease, and eye irritation. The term "indoor air quality" refers to the building's residents' air quality. Physical variables, chemical or gaseous pollutants, and biological factors. Toxic gases are likely to be present in any laboratory where experiments or research are carried out. These contaminants can harm the health of the people that are working there, and the important work that is being done in this environment remains unaffected. A web-based system for indoor air quality monitoring in lab IAQML is presented in this study. The project was established to keep track of air quality metrics in the lab environment like carbon dioxide, carbon monoxide, alcohol, phenol, toluene, LPG, benzene, ammonia, and methane, if not properly maintained, this can have an impact on the inhabitants' comfort, health, and indoor working condition. In general, the proposed project involves a selection of metal oxide MQ-sensors and a Wi-Fi module connected to an Arduino microcontroller. The measured data from sensors is calculated in ppm units and then displayed on the Android device. Also, gas data is sent to the webpage through the ThingSpeak platform dashboard. The system has a notification function to alert students and workers in the laboratory when measurements of air quality are above or below specified thresholds. On the other hand, this allows for a well-controlled and maintained quality standard for indoor air pollutants.

Keywords: VANETs, V2I, IEEE 802.11p, Channel Coordination, Throughput

SESSION 2C: Track: Embedded Computing and Cyber-Physical Systems for the IoE (EC-CPS-IoE) + Intelligent Technologies for Internet of Everything (IT-IoE)

PAPER ID:10

Arabic Poetry Meter Categorization Using Machine Learning Based on Customized Feature Extraction

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Abstract

Text mining applications became important in various intelligent tasks. Text documents are the most materials that record many important procedures in various worldwide organizations and different people cultures. Text poetry is an important type of people culture and education domains media. Arabic text poems classification is a few experimented field, however, it has an important presence and special influence. Both recent and old Arabic poetry have unique approach for rhythmical harmony measure, which can be used for identifying Arabic poems types. Deep learning as a machine learning method has many distinctive achievements in many areas, as well as, text classification tasks. In this paper, Arabic poetry text is categorized. A customized feature selection is proposed, which is fused with a clustering technique for enhancing models efficiency. Deep learning has experimented alongside two popular machine learning techniques; support vector machine and decision tree. The proposed feature extraction method has achieved high accuracy with all three techniques. The results are better than many related works

Keywords: Text Classification, Arabic Poetry Meter, Arud Science, deep Learning, NLP, Support Vector Machine, Decision Tree

PAPER ID: 19

A Tool Model Group (TMG) Development to Enhance Student Performance

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Abstract

Educational institutions in different contexts of the world are increasingly working on exploring the potential of educational development and challenges that might enhance student performance. Still, there are missing benefits of using applications that directly impact the enhancement of student performance in Oman. This paper aims to create a "Tool Model Group" (TMG) model to improve student performance using technological learning techniques in modified evaluation to enhance academic performance. In the first phase of this study, a systematic review of the existing literature was conducted to determine the degree of acceptability and effectiveness of existing applications in e-learning. The second stage involved designing a model for the hybrid e-learning tools. It is followed by a system efficiency check that can measure the technology's suitability for academic performance. The findings of this paper show a significant result of TMG impact on student performance in Oman.

Keywords: E-learning, TEL, Assessment Method, Academic Performance.

PAPER ID:30

Ransomware Threat Detection using Machine Learning Techinques
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[1,2] Al Nahrian University

Abstract

Ransomware is a word used to describe a type of malware that uses the internet to extort money from victims in return for decryption keys for encrypted data or systems. Ransomware has grown in importance, and its consequences are becoming more severe. Unlike other security threats, ransomware has an irrevocable and difficult-to-reverse effect. The necessity for creating a system capable of proactively detecting and preventing ransomware is never-ending. A new ransomware detection approach based on machine learning is proposed in this study. Our technology can differentiate between ransomware and innocuous files with a detection accuracy of up to 98.33 percent, according to the results of our tests.

Keywords: ransomware detection, machine learning, cyber-security, malware analysis, network security, feature extraction, feature selection

PAPER ID: 67

A Secure EEG Simulator for Remote Healthcare Evaluation
[1] Azhar Kassem Flayeh, [2] Azmi Shawkat Abdulbaqi and [3] Ismail Yusuf Panessai
[1] Yildiz Techniqal University, [2] University of Anbar and [3] UPSI

Abstract

EEG Simulator or often called EEG Specter in principle is a signal generator in the form of an "EEG-like" signal or EEG signal that has been recorded. The purpose of this manuscript is to design an EEG Simulator tool. The design through the stages as follows: circuit design and circuit testing. This design is based on Arduino UNO and uses 12-bit Digital to Analog Converter to convert Digital data which is the output of Arduino UNO into Analog data in the form of EEG signals. Based on the measurement results obtained an error rate (ER) of 0.420% sensitivity of 0.5mV, 0.22% sensitivity of 1.0mV, and 0.22% sensitivity of 2.0mV in the BPM setting 30, obtained an ER value of 0.342% sensitivity of 0.5mV, 0.460% sensitivity of 1.0mV, and 0.432 % sensitivity of 2.0mV at BPM setting 60, obtained an error rate value of 0.121% sensitivity of 0.5mV, 0.1% sensitivity of 1.0mV, and 0.1% sensitivity of 2.0mV at setting BPM 120, obtained an error rate value of 0.423% sensitivity of 0.5mV, 0.310% 1.0mV sensitivity, and 0.520% 2.0mV sensitivity at 180 BPM settings and 0.246% 0.5mV sensitivity, 0.230% 1.0mV sensitivity and 0.246% 2.0mV sensitivity at 240 BPM settings.

Keywords: Electroencephalogram (EEG), EEG Signal Evaluation, Remote Healthcare

PAPER ID: 107

Cloud Based Surveillance using ESP32 CAM
Akwinder Kaur
Chandigarh University

Abstract

The idea of surveillance has always lingered around from community to guards to police to CCTV to Drones. It is just getting upgrade with the time. The recent times with the involvement of artificial intelligence the surveillance and cloud monitoring has changed the way and efficiency. This project involves similar surveillance techniques in which we intend to detect people not wearing a mask. The project was an inspiration for the current pandemic situation and to be ready for the future. The project also includes cloud monitoring and streaming the live footage on the server. A Convolutional Neural Network is developed to predict whether someone is wearing a mask or not. It is deployed on a self-made server and can be monitored remotely. The camera used to capture the video is ESP32. This project have huge implementation around the world given the present situation and has the potential to be used in the future.

Keywords: Django, ESP32, HTTP STREAMING Protocol, OpenCV, Convolution Neural Network, Accuracy

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Time Series Forecasting for Clients Rates in Tele-Communication Data using Statistical Techniques

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Abstract

Nowadays, massive data highlights the significance of exploiting data mining technology for business needs. Data estimation is one of the business important demands, which is one of data mining objectives as well. Hence, data mining has utilized machine learning (ML) and statistical analysis (SA) techniques for developing business intelligence solutions. Time Series (TS) forecasting methods are tested and enhanced. Such enhancement is increasing the power of TS abilities, which is served to respond to business future estimation requirements. In this paper, an investigation for TS methods distinction is implemented. Four TS methods are applied to forecast the next five years of clients' rates of two Yemeni's communication companies. The four methods are Movement Average (MA), Weighted Movement Average (WMA), Least Square (LS), and Exponential Smoothing (ES). The estimated data is evaluated by comparing TS series forecasting methods. Keywords:— Time Series, Data Mining, Data Forecasting, Movement Average (MA), Weighted Movement Average (WMA), Least Square (LS), Exponential Smoothing (ES).

Keywords: Time Series, Data Mining, Data Forecasting, Movement Average (MA), Weighted Movement Average (WMA), Least Square (LS), Exponential Smoothing (ES).

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Factors Affecting Intention to Adopt Open Source ERP Systems by SMEs in Yemen

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Abstract

Small and medium-sized enterprises (SMEs) are significant contributor towards countries economic activities. SMEs need to use enterprise resource planning (ERP) systems to increase revenue and productivity. Due to the high licensing costs of these systems, open source ERP (OSERP) could be an alternative solution to this problem. This study aims to investigate the factors affecting the intention to adopt OSERP system by SMEs in Yemen using Technology-Organization-Environment (TOE) Framework and The Diffusion of Innovation (DOI) Theory. Using a questionnaire, data was collected from the sample of 600 subjects. The model was validated empirically using Structural Equation Modeling (SEM). The results show that relative advantage, compatibility, trialability, observability, ICT infrastructure, IT skills, top management support, cost saving, competitive pressure, vendor support and regulatory support have positive influence on the intention to adopt OSERP. While complexity has negative impact on the intention to adopt. However, security and organization culture have no significant influence on the intention to adopt OSERP by SMEs in Yemen.

Keywords: open source, enterprise resource planning, Yemen, adoption, small and medium size enterprises

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