



**IEEE Signal Processing Society Chapter Certification Form 2015**  
(to be submitted by December 23, 2014)

**Contact Information**

IEEE Region: **8**

Name of Chapter: **IEEE UAE Section Signal Processing and Communication Chapter (SP01/COM19)**

**Chapter Chair:**

1. Name: **Prof. Bayan Sharif**
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3. E-mail address: **bayan.sharif@kustar.ac.ae**
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5. Date of (first) Appointment: **June 19<sup>th</sup>, 2013**

**Chapter vice chair:**

1. Name: **Dr. Ali Dawood**
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6. Date of (first) Appointment: **January 1<sup>st</sup>, 2014**

**Chapter Secretary/Treasurer:**

1. Name: **Dr. Hamada Alshaer**
2. Mailing address: **Khalifa University of Science, Technology & Research (KUSTAR)**  
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6. Date of (first) Appointment: **June 19<sup>th</sup>, 2013**

## **Chapter Activities**

The IEEE SPC chapter activities in 2014 are divided into two categories: lectures, and International research workshops and research/education forums.

<b>IEEE UAE Signal Processing and Communication Chapter activities in 2014: Lectures</b>								
<b>Num ber</b>	<b>Lecture title</b>	<b>Speaker</b>	<b>IEEE distinguished lecturer</b>	<b>Attendance</b>		<b>Date</b>	<b>Location</b>	<b>Reported to IEEE(L31 report)</b>
				IEEE members	Non-IEEE members			
<b>1</b>	Research challenges in wireless communications systems	Prof. George K. Karagiannidis	No	30	6	10 <sup>th</sup> March 2014, 1:00 – 2:00 PM	Khalifa University, UAE	Yes
<b>2</b>	Ultra-wide band as an underlay technology for cognitive Radio	Prof. Jocelyn Fiorina	No	22	4	20 <sup>th</sup> May 2014, 12:00 – 1:00 PM	Khalifa University, UAE	Yes
<b>3</b>	A time-reversal paradigm for green internet of things	Prof. K. J. Ray Liu	Yes	23	12	1 <sup>st</sup> June 2014, 12:00-1:00 PM	Khalifa University, UAE	Yes
<b>4</b>	Integration of WBANs and cloud technologies for future cost-effective eHealthcare	Prof. Nazim AGOULMINE	Yes	16	9	8 <sup>th</sup> June 2014, 12:00-1:00 PM	Khalifa University, UAE	yes
<b>5</b>	Wireless Power transfer: State-of-the art and future challenges	Prof. Zhiguo Ding	No	16	4	16 <sup>th</sup> June 2014, 3:30 -5:00 PM	Khalifa University, UAE	yes
<b>6</b>	White Space Networking	Prof. Sumit Roy	Yes	26	8	9 <sup>th</sup> Nov. 2014, 12:00 -1:00 PM	Khalifa University, UAE	Yes
<b>7</b>	Trends and Issues of FTTH and G-PON	Prof. Koichi Asatani	Yes	19	4	23 <sup>rd</sup> Nov. 2014, 12:00 -1:00 PM	Khalifa University, UAE	Yes
<b>8</b>	Spectrum Scarcity and Free Space Optical Communications	Prof. Mohamed-Slim Alouini	No	20	9	26 <sup>th</sup> Nov. 2014, 12:00 -1:00 PM	Khalifa University, UAE	Yes
<b>9</b>	Reconfigurable Antenna-based Space-Shift Keying (SSK) for Future Wireless Networks	Prof. Ali Ghrayeb	No	15	3	27 <sup>th</sup> Nov. 2014, 12:00 -1:00 PM	Khalifa University, UAE	Yes
<b>10</b>	Cooperative Service Management in Healthcare Sector	Prof. Pradeep Ray	Yes	15	3	14 <sup>th</sup> Dec. 2014, 12:00 -1:00 PM	Khalifa University, UAE	Yes

**IEEE UAE Signal Processing and Communication Chapter activities in 2014:**  
**International research workshop and research/education forum**

Number	Event title	Purpose Education/technical	IEEE Sponsored	Attendance	Date	Location	Reported to IEEE (L31 report)
1	Participation in this event organized by Khalifa University : The UAE Forum on Information and Communication Technology Research 2014 (ICTRF2014)	To discuss Big Data, Smart Government, Smart Health, and Smart Grid Opportunities and challenges.	It is sponsored by Khalifa University	International, regional (GCC) and UAE local interested academic, industrial and professionals persons attended this workshop	11 <sup>th</sup> May 2014,	Khalifa University, UAE	Yes: Lecture number 5 was reported as L31
2	International Workshop on the green optimized wireless networks (GROWN 2014)	To discuss green communication opportunities and research challenges	Co-located with the 10 <sup>th</sup> IEEE International Conference on Wireless and Mobile Computing, Networking and Communications (WiMob 2014)	International attendance	8 <sup>th</sup> October 2014	Larnaca, Cyprus	This is an international workshop co-located with a well-established IEEE Conference

## **Total Chapter Membership**

Number of members in SPC/CoMSoc:

1. 2013 year end: 87
2. 2014 year end: 149

Number of student members in SPC/ComSoC:

1. 2013 year end: 8
2. 2014 year end: 65

We observe a very good growth in IEEE SPC/CoMSoc membership.

## **Quality Assessment Questionnaire**

Please answer the following questions based on activities in 2014 (no more than 1200 words in total).

- **Describe the two most successful technical activities held by your chapter.**
  - “Research challenges in wireless communications systems” seminar presented by Prof. George K. Karagiannidis , ECE department, Khalifa University, UAE, 10 – March – 2014.
  - “White Space Networking” lecture given by Prof. Sumit Roy (IEEE Distinguished lecturer) from the Electrical Engineering, Washington University, Seattle, USA, Khalifa University, UAE, 9 –November– 2014.

High profile people from academia and industry attended these above technical events. This resulted in initiating research collaboration with KUSTAR and establishing multi-disciplinary research among the different engineering departments.

- **Describe the most successful education program held by your chapter.**

UAE Forum on Information and Communication Technology Research 2014 (ICTRF2014)  
( <http://events.kustar.ac.ae/ictrf2014/> )

The chair of IEEE UAE SPC invited some key professors and scientists to present some important research and social topics to IEEE SPC members, industrial engineers and academic researchers in UAE.

- **Has your chapter participated in a Distinguished Lecturers Program? If yes, provide a brief description of the lectures.**

Yes, the distinguished lectures 3, 4, 6, 7, 10 listed in the technical activities are co-sponsored by the IEEE SP and ComSoc. They were reported on IEEEvttools meetings. Please find the descriptions of these lectures at the end of this document.

- **Has there been growth in your chapter's membership?**

Yes, we have observed a very good membership growth in the IEEE SP/Com and joint societies. The membership rate of the IEEE UAE SP/Com/ComSoc remains ahead of the other IEEE UAE chapters.

- **Have other IEEE society chapters or local industry been involved in your chapter's activities? If yes, how?**

Yes, the IEEE UAE Computer chapter and education chapter were involved in the International research workshop and research/education forums activities.

- **Has your chapter established any student branches or chapter sponsored affinity groups (GOLD or WIE)?**

We encourage students to attend the lectures and events organized by the IEEE SPC chapter. We also support other members at KUSTAR to organize some dedicated activities for IEEE UAE Students, which mainly include competitions focusing on:

- Common (multidisciplinary )design projects for junior and senior students
- Software design projects for junior and senior students)
- Engineering design projects for freshmen and sophomore students

Please find the descriptions of these IEEE UAE Students at the end of this document.

- **How does your chapter use social media to promote its activities (i.e. Facebook group, twitter account, podcast/webinars)?**

The IEEE SPC chapter has recently got its page on Facebook (<https://www.facebook.com/pages/IEEE-UAE-Signal-Processing-and-Communication/358168644365725> ). In addition to promotion out activities, it will serve as a platform for discussing IEEE SPC chapter activities and plans with IEEE members. Students and members can contribute with their ideas in developing the IEEE SPC chapter Facebook page.

Besides, we issue attendance certificates to encourage students, professionals, engineers and junior researchers to attend our activities and take part in developing its scope. Please find some certificate examples at the end of this document.

- **What else has your chapter done for the committee to consider?**
- **Describe your Chapters awareness of and participation in SPS level initiatives, such as: SigPort and/or SigView.**

We make available all the technical materials given or discussed in the events organized by the IEEE SPC to the members and students. Obviously, we encourage them to check SigPort to find the technical materials they need for obtaining early and broad exposure on their work. Some Students at Khalifa University already use SigView to analyze on real-time communication signals and visualize the signal output of some signal processing and communication systems. We also teach these staffs under the course lab (CMME-331) Modeling and Simulation of Communication Systems Lab.

- **Describe the two most successful industry related activities.**

## **Chapter-of-the-Year Award**

**The IEEE Signal Processing Society (SPS) Chapter-of-the-Year Award (CoYA) is given annually to a chapter that has provided their membership extraordinarily high quality of programs, activities and services.**

Would your Chapter like to be considered as a candidate for the 2015 IEEE SPS CoYA?

Yes, the IEEE UAE SPC chapter is a candidate for the 2015 IEEE SPS CoYA.

## **Objectives and Plans**

Describe objectives and plans for 2015 and future goals:

1. Continuation of project/activity in progress and their Implementation plans
  - Participating in this education forum organized by Khalifa University : The UAE Forum on Information and Communication Technology Research 2015 (ICTRF2015)
  - Participating in the organization of the International Workshop on the green optimized wireless networks (GROWN 2015)
  - Inviting more IEEE Distinguished lecturers.
2. New objectives and plans in 2015
  - Organization social events to promote IEEE SPC chapter's activities.
  - Coordinating multidisciplinary activities cross IEEE UAE chapters.
3. Future goals
  - Increasing the IEEE UAE SPC membership growth rate
  - Attracting high profile IEEE conferences to be held in UAE.

## **Comments and Suggestions**

Provide your comments and/or suggestions to IEEE SPS.

<b>Date :</b>	Sunday, June 1st, 2014.	<b>Time:</b>	12:00 PM-1:00 PM
<b>Venue:</b>	Auditorium Level 3, H (Academic) Building, Khalifa University, Abu Dhabi Campus.		
<b>Title:</b>	A Time-Reversal Paradigm for Green Internet of Things		
<b>Speaker:</b>	Professor K. J. Ray Liu, Department of Electrical and Computer Engineering University of Maryland, College Park, USA.		

**Abstract**

In recent years, with the explosive growth of wireless communication, the energy consumption of wireless networks and devices is experiencing a dramatic increase. Because of ubiquity of wireless applications, such increasing energy consumption not only results in a high operational cost and an urgent demand for battery/energy capacity to wireless communications operators, but also causes a more severe electromagnetic pollution to the global environment. Therefore, an emerging concept of “Green Communications” has received considerable attention in hope of finding novel solutions to improve energy efficiency, relieve/reduce radio pollution to unintended users, and maintain/improve performance metrics.

To qualify as a green wireless technology, one must meet two basic requirements: one is low energy consumption (environmental concerns) and the other is low radio pollution to others (health concerns) besides the intended transmitter and receiver. In the first part of the talk, we argue and show that the time-reversal (TR) signal transmission is an ideal paradigm for green wireless communications because of its inherent nature to fully harvest energy from the surrounding environment by exploiting the multi-path propagation to re-collect all the signal energy that would have otherwise been lost in most existing communication paradigms. Our theoretical analysis and simulations show that a potential of over an order of magnitude of power reduction and interference alleviation can be achieved. We also demonstrate a very high multi-path diversity gain exhibiting in a TR system. In essence, TR transmission treats each multi-path as a virtual antenna and makes full use of all the multi-paths. Experimental results obtained from measurements in real RF multi-path environment are shown to demonstrate the great potential of TR-based transmission as an energy-efficient green wireless communication paradigm. In the second part, we will demonstrate why the TR paradigm is an ideal technology for the future green Internet of Things.



<b>Speaker's Biography</b>	
<p>Prof. K. J. Ray Liu was named a Distinguished Scholar-Teacher of University of Maryland in 2007, where he is Christine Kim Eminent Professor of Information Technology. He leads the Maryland Signals and Information Group conducting research encompassing broad areas of signal processing and communications with recent focus on cooperative communications, cognitive networking, social learning and networks, and information forensics and security. Prof. Liu has received numerous honors and awards including IEEE Signal Processing Society 2009 Technical Achievement Award. A Fellow of the IEEE and AAAS, he is recognized by Thomson Reuters as an ISI Highly Cited Researcher. Prof. Liu was President of IEEE Signal Processing Society. He was the Editor-in-Chief of IEEE Signal Processing Magazine and the founding Editor-in-Chief of EURASIP Journal on Advances in Signal Processing. Prof. Liu also received various research and teaching recognitions from the University of Maryland, including Poole and Kent Senior Faculty Teaching Award, Outstanding Faculty Research Award, and Outstanding Faculty Service Award, all from A. James Clark School of Engineering; and Invention of the Year Award from Office of Technology Commercialization.</p>	
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<b>Registration</b>	<a href="https://meetings.vtools.ieee.org/meeting_registration/register/26009">https://meetings.vtools.ieee.org/meeting_registration/register/26009</a>
<b>Inquiries</b>	Dr. Ali Dawood, Associate Professor, Assistant Director- Sharjah Campus Email : <a href="mailto:dawood@kustar.ac.ae">dawood@kustar.ac.ae</a>

<b>Date :</b>	Sunday, June 8th, 2014.	<b>Time:</b>	12:00 PM-1:00 PM
<b>Venue:</b>	Auditorium Level 3, H (Academic) Building, Khalifa University, Abu Dhabi Campus.		
<b>Title:</b>	Integration of WBANs and Cloud Technologies for Future Cost-effective eHealthcare		
<b>Speaker:</b>	Prof. Nazim Agoulmine, University of Evry Val d'Essonne, France.		

### Abstract

Many countries continue to face the major challenge of economically supporting their welfare systems, particularly medical/health benefits. Without novel solutions to reduce the cost of conventional systems such as cost of hospitalization and specialized institutions, existing well fair systems of many countries will fail. ICT (Information and communications technologies) have been recognized as an important part of innovative cost-effective solutions to reduce the financial load of healthcare for this population. Wireless medical sensors can be deployed in home or dedicated environments to measure patient physiological parameters and detect as early as possible any anomaly and send it to remote health professional such as doctors or dedicated staff working in remote hospitals and centers. In addition, with the help of Cloud technology, it is possible to outsource expensive health management software directly to the cloud and reduce the OPEX costs as well as increasing its usage scale to a level that the cost per patient may decrease significantly. With the help of this combination of medical wireless sensors, high speed internet accesses and cloud infrastructures, doctors, nurses and other health-related personnel could manage their patients remotely in a more efficient and cost-effective way. The aim of this presentation is to highlight these tremendous advances in communication and information processing technologies and how to glue them together to build these new solutions.

### Speaker's Biography

Prof. Nazim Agoulmine (IEEE Senior Member) is a Full Professor at the University of Evry Val d'Essonne, France and head of the LRSM group - IBISC Computer Science Research Lab. He is also a Program Officer at the ANR (French National Science Foundation) and very recently the vice deputy chair of the TIC department. Since 1989, he has been involved in several large



research projects on broadband wireless and fixed network management funded by the EU commission: Advance, Pemmon, Forms, ICM, Adanets, Seimonet, Sumo, Wellcom, Expeshare, Easi-clouds) and the French National Research Council CNRS (Cesame, Amarrage, Polymage, etc.). His current research interests are ubiquitous networking, context awareness, autonomic systems, cloud computing, fixed and mobile networks, ad-hoc and WSN, multimedia communications with applications in various societal use cases (eHealth, eLearning, Smart Grid). He has served and still serving in several technical programme committees of IEEE international conferences: HEALTHCOM, MMNS, IM, NOMS App, LANOMS, ASNOMS, MWCN, LAACS, BCN, GIIS, etc. Nazim Agoulmine has served as the general co-TPC chair of IEEE HEALTHCOM' 2012, IEEE/IFIP IM'2011, NATO ASIGE'2010, IEEE LANOMS'2009, IEEE BCN'2010/09/08/07/06, IEEE MMNS'2003 IEEE DANSM'2007, IEEE GIIS'2007, HPOV'2004 . He has published more than 100 peer-reviewed papers in the areas of networking and multimedia systems. He is the co-author of three books on Network Management and Multimedia Systems. He was awarded two international patents and has been giving several invited/keynote/plenary presentations in several international conferences and workshops. Dr. Agoulmine is currently a secretary a member of the e-Health IEEE Committee. He is also the area editor of the International Journal on Computer Networks - COMNET, associate editor board of the international Journal of Computing Science and Engineering - JCSE and member of the editorial review board of the "International Journal of E-Health and Medical Communications - IJEHMC. He was also the guest editor of two IEEE Communications Magazine Special Issues in 2012 on "Communications in Ubiquitous Healthcare: Wireless Sensors, Networked Devices, Protocols and Solutions". He is also the guest editor of the special issue "on Green Mobile Cloud Computing on Green Mobile Cloud Computing", Elsevier International Journal.

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<b>Inquiries</b>	Dr. Ali Dawood, Associate Professor, Assistant Director- Sharjah Campus Email : dawood@kustar.ac.ae Dr. Youssef Iraqi Associate Professor, Computer Engineering Program, ECE Department- Sharjah Campus Email : Youssef.Iraqi@kustar.ac.ae

<b>Date :</b>	Sunday, November 9 <sup>th</sup> , 2014.	<b>Time:</b>	12:00 PM-1:00 PM
<b>Venue:</b>	Auditorium Level 3, H (Academic) Building, Khalifa University, Abu Dhabi Campus.		
<b>Title:</b>	White Space Networking		
<b>Speaker:</b>	Professor Sumit Roy Department of Electrical Engineering University of Washington, Seattle. <a href="http://www.ee.washington.edu/research/funlab">www.ee.washington.edu/research/funlab</a>		

### Abstract

The evolution of cognitive (secondary) networks to enable more efficient spectrum usage will rely on fast and accurate spectrum sensing/mapping, supported by a suitable architecture for data integration and model building. In the first part of the talk, fundamental aspects of the wide-area RF mapping problem as a grand challenge will be highlighted; and some recent work at UW that underpin sub-system level trade-offs (between scan latency and channel status estimation accuracy) for channel sensing described. Next, the role of centralized databases in RF map creation for enabling primary-to-secondary and secondary-to-secondary coexistence is explored and a hybrid architecture proposed – that involves both distributed (crowd-sourced) local sensing as well as it's integration into databases. Finally, some ongoing work regarding a fundamental question: how much white space capacity is actually available – will be described.

### Speaker's Biography

Sumit Roy (Fellow, IEEE) received the B. Tech. degree from the Indian Institute of Technology (Kanpur) in 1983, and the M. S. and Ph. D. degrees from the University of California (Santa Barbara), all in Electrical Engineering in 1985 and 1988 respectively, as well as an M. A. in Statistics and Applied Probability in 1988. Presently he is Integrated Systems Professor of Electrical Engineering, Univ. of Washington where his research interests broadly encompass analysis/design of wireless communication and sensor networked systems. His recent research emphasis includes multi-standard wireless inter-networking and cognitive radios, vehicular and sensor networking involving RFID technology and networking for the emerging Smart Grid. He spent 2001-03 on academic leave at Intel Wireless Technology Lab as a Senior Researcher engaged in systems architecture and standards development for ultra-wideband systems



(Wireless PANs) and next generation high-speed wireless LANs. He served as Isaac Walton Fellow at University College Dublin for Jan-Jun 2008, and as a UK Royal Acad. Engineering Distinguished Visitor for summer 2011. His activities for the IEEE Communications Society (ComSoc) includes membership of several technical and conference program committees, notably the Technical Committee on Cognitive Networks and is currently a ComSoc Distinguished Lecturer for 2014-15. He has served as Associate Editor for IEEE Trans. Communications, IEEE Trans. Wireless Communications and IEEE Trans. Smart Grids, and currently serves on the Editorial Board for IEEE Trans. Circuits & Systems II Express Briefs. Most recently, he served as a Guest Editor for the 2014 J. Selected Areas Communications Spl. Issue on Smart Grid Communications.

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<b>Inquiries</b>	Dr. Ali Dawood, Associate Professor, Assistant Director- Sharjah Campus Email : <a href="mailto:dawood@kustar.ac.ae">dawood@kustar.ac.ae</a>



<b>Date :</b>	Sunday, November 23 <sup>rd</sup> , 2014.	<b>Time:</b>	12:00 PM-1:00 PM
<b>Venue:</b>	Auditorium Level 3, H (Academic) Building, Khalifa University, Abu Dhabi Campus.		
<b>Title:</b>	Trends and Issues of FTTH and G-PON		
<b>Speaker:</b>	<p>Professor Koichi Asatani          IEEE Distinguished Lecturer, IEEE Fellow, IEICE Fellow.          Ph D, Professor, Nankai University, Tianjin, China.          Professor Emeritus, Kogakuin University, Tokyo, Japan.</p>		

### Abstract

Thanks to the penetration of broadband access technologies for Internet, real-time applications like VoIP, streaming applications like IPTV and many other delay-sensitive applications are growing very fast.

FTTH is the key broadband technology and is replacing ADSL. It provides stable high throughput, realizing even Gbps class. It also plays a very important role in Next Generation Networks (NGN). The NGN is Carrier-grade network for the future and a converged solution after the legacy telecom networks by enabling QoS management and controls in IP network like in legacy telecom networks and by supporting economical, versatile multi-media applications like those on the Internet with secure manners.

In realizing FTTH, G-PON is widely adopted. International Standards on FTTH, G-PON in particular has been established and is being further developed.

This lecture consist of the following contents

- Introduction to Access Networks
- Fundamentals of FTTH
- Requirements to FTTH
- Regulatory Aspect of FTTH
- Global Standards on FTTH and G-PON
- Market Trends
- Further Issues

### Speaker's Biography

Koichi Asatani received his B.E.E.E., M.E.E.E. and Ph. D. degrees from Kyoto University in

1969, 1971 and 1974, respectively. From 1974 to 1997, Dr. Asatani was engaged in R&D on optical fiber communication systems, hi-definition video transmission systems, FTTH, ISDN, B-ISDN, ATM networks, IP Networks and their strategic planning in NTT. In 1997 he joined Kogakuin University as a professor, and in 1999 he joined, Graduate School of Global Information and Telecommunication, Waseda University as a visiting professor, both in Tokyo, Japan. He is currently a Professor, Nankai University, Tianjin, China and a Professor Emeritus, Kogakuin University. He is a Fellow of IEEE and a Fellow of IEICE. He was appointed as a distinguished lecturer of IEEE Communications Society for 2006-2009 and 2011-2012, 2013-2014.

He is a founder of Communications QoS, Reliability and Performance Modeling series symposium at ICCs and Globecom. He served as co-chair for this symposium at ICCs and Globecom for 2002-2004. He is Ex-Chair and Advisory Board Member of IEEE Technical Committee on Communication Quality and Reliability (CQR-TC), Feature Editor on Standards (1993-1999), Senior Technical Editor (1999-2005) of IEEE Communications Magazine. He also served as Executive Chair, ICC2011 in Kyoto. From 1988 through 2000, he served as Vice-Chairman of ITU-T SG 13 (formerly CCITT SG XVIII), responsible for digital networks including GII, IP networks, NGN and Future Networks. He serves as Chair for National Committee on Next Generation Networks in Japan. He is also serving as Chair, R&D and Standardizations Working Group, Next Generation IP Network Promotion Forum. He is serving as IEEE Communications Society Director, Member Programs Development for 2014-2015 term. He was also elected as Board of Governor, IEICE and Chair, IEICE Standardization Committee for 2014-2016.

He has published more than fifty papers, and gave more than 120 talks including keynotes and invited talks at international conferences. He is author or co-author of nineteen books including "Designs of Telecommunication Networks"(IEICE, 1993, in Japanese), "Introductions to ATM Networks and B-ISDN" (John Wiley and Sons, 1997), "Multimedia Communications" (Academic Press, 2001), "Introduction to Information Networks-Fundamentals of Telecom & Internet Convergence, QoS, VoIP and NGN-" (Corona-sha Publishing, in Japanese, 2007).

His current interests include Information Networks including Broadband networking, Internet Interworking, IP telephony, NGN, Future Networks and their QoS aspects.

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<b>Inquiries</b>	Dr. Ali Dawood, Associate Professor, Assistant Director- Sharjah Campus Email : <a href="mailto:dawood@kustar.ac.ae">dawood@kustar.ac.ae</a>





<b>Date :</b>	Sunday, December 14th, 2014.	<b>Time:</b>	12:00 PM-1:00 PM
<b>Venue:</b>	Auditorium Level 2, H (Academic) Building, Khalifa University, Abu Dhabi Campus.		
<b>Title:</b>	Cooperative Service Management in Healthcare Sector: Emerging Trends and Future Challenges		
<b>Speaker:</b>	<b>Professor Pradeep Ray</b> ( <a href="http://www.apuhc.org/pradeep/">http://www.apuhc.org/pradeep/</a> ) Director, WHO Collaborating Centre on eHealth, Asia-Pacific ubiquitous Healthcare research Centre (APuHC), University of New South Wales, Sydney Australia		

### **Abstract**

Network and Service Management have made rapid strides in many sectors of the economy, such as telecommunications and finance sectors. Thanks to the explicit support for cooperation within and across organizations, cooperative network and service management lead to better efficiency and better quality of services worldwide. There have been attempts by many groups to implement such benefits in the healthcare sector, the largest business sector in the world. However, this sector presents some unique challenges that have to be overcome if networked services have to succeed in this sector. These challenges include semantic interoperability, privacy enabled services and difficulties in the evaluation of such services. This talk will present an overview of emerging trends and future challenges in this field based on the presenter's experience in the areas of integrated service management and e-Health through the leadership of a number of global initiatives, such as the WHO eHealth for Healthcare Delivery (eHCD) involving four countries, ITU-D Mobile e-Health initiative (m-Health) for developing countries and the global assessment of mobile mHealth involving twelve countries.

### **Speaker's Biography**



**Prof. Pradeep Ray** is the Director of the WHO Collaborating Centre on eHealth at the University of New South Wales, Australia. He is the founder of the Asia-Pacific ubiquitous Healthcare Research Centre (APuHC) aimed at conducting research on the development and evaluation of ubiquitous healthcare using emerging technologies, such as the mobile broadband communication technologies. He is led to completion several global initiatives, such as the WHO Research on the Assessment of e-Health for Health Care Delivery (eHCD) involving a number of countries in the Asia-Pacific region (India, China, Vietnam and Philippines), ITU-D/IEEE Mobile eHealth Initiative for Developing Countries and the Global Longitudinal Study on the Assessment of mHealth (healthcare using mobile phones). He was also involved in the Rockefeller Foundation Mekong Basin Disease Surveillance (MBDS) project involving Thailand, Laos, Vietnam, Cambodia and part of China. APuHC has been involved in several international initiatives on the application of mHealth for disaster management, such as in Indonesia, Sri Lanka, Bangladesh, PNG and India. Prof. Pradeep Ray was the Chair of the IEEE Technical Committee on eHealth (eHealthTC) and the founder of IEEE Healthcom that is now the forum of discussions for the IEEE/ITU-D/WHO initiatives on e-Health and m-Health.

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<b>Inquiries</b>	Dr. Ali Dawood, Associate Professor, Assistant Director- Sharjah Campus Email : <a href="mailto:dawood@kustar.ac.ae">dawood@kustar.ac.ae</a>



**KHALIFA**  
UNIVERSITY



**IEEE**

IEEE Signal and  
Communication Chapter  
UAE

## CERTIFICATE OF ATTENDANCE

*This is to certify that*

**Ameera Al Marzooqi**  
(IEEE Membership No. 92992348)

*attended the seminar organized by*

*Khalifa University & IEEE Signal Processing and Communication chapter (UAE) on*

### **White Space Networking**

*that was held on 9th November 2014, at Khalifa University, Abu Dhabi campus*

Prof. Bayan Sharif  
Dean & Professor, College of Engineering,  
IEEE Signal Processing and Communication Chair,  
Khalifa University, Abu Dhabi, UAE.



**KHALIFA**  
UNIVERSITY



**IEEE**

IEEE Signal and  
Communication Chapter  
UAE

## CERTIFICATE OF ATTENDANCE

*This is to certify that*

*Karamath Ateeq*

*attended the seminar organized by*

*Khalifa University & IEEE Signal Processing and Communication chapter (UAE) on*

***White Space Networking***

*that was held on 9th November 2014, at Khalifa University, Abu Dhabi campus*

Prof. Bayan Sharif  
Dean & Professor, College of Engineering,  
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**KHALIFA**  
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**IEEE**  
IEEE Signal Processing  
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Chapter (UAE)

## CERTIFICATE OF ATTENDANCE

*This is to certify that*

**FAHD TAALAB**

(IEEE MEMBERSHIP NO. IS: 92994765)

attended the seminar organized by

Khalifa University & IEEE Signal Processing and Communication chapter (UAE) on

***Trends and Issues of Fiber To The Home and Gigabit Passive Optical Network***

That was held on 23rd November 2014, at Khalifa University, Abu Dhabi campus

*Bayan Sharif*

Prof. Bayan Sharif  
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## 9<sup>th</sup> IEEE UAE Student Day (2014)

### Engineering Design Project (EDP) Competition

#### Mini Hydraulic Lift

##### GENERAL INFORMATION

This competition is intended to give students an opportunity to explore the art, science and hence infinite possibilities of system design. The objective of this project is to build a single armed mini hydraulic lift that able to carry load from the floor, move it around then put it on shelf.

Students in the first/second year of their engineering education are particularly encouraged to participate. They will be able to show their creativity, innovative designs and have fun!

A panel of three judges, to be selected by the IEEE UAE Students Day steering committee, will assess the entries to the competition. The competition rules, the criteria that will be used for judging the entries and the evaluators form are given below.

##### DETAILED SPECS

The mini hydraulic lift (system) motion should be performed through the fluid dynamics and the basic mechanical movement and conveyor components. No direct contact between the user hand and the target (load or the shelves) is allowed. The user is allowed only to control the fluid to the system tubes which will transfer the motion to the other system components accordingly. The system should be able to carry a cuboid load of different weights (50 gm, 200 gm, or 1000 gm) and dimensions (LengthXWidthXHeight) (20cmX10cmX5cm, 30cmX20cmX10cm and, 40cmX30cmX15cm) as shown in fig.1. One load is to be carried at any given time. The load is to be lifted from the floor level, moved till reach a shelf then placed on the shelf. Three shelves of three different dimensions (LengthXWidth) (30cmX20cm, 30cmX20cm and, 25cmX20cm) as shown in fig.2, placed fixed each on a stand on three different heights (30 cm, 60 cm, and 100 cm) and on three different distances from the three different starting points (50 cm, 100 cm, and 150 cm) respectively as shown in fig.3 are used to test the system. Once the mini hydraulic lift is placed at the starting point and the team starts the lifting process it will not be allowed to move the system during the lift until finishing the process. It is worth noting that the dimensions and weights given in Figure 1 are approximate and the exact dimensions and weights will be notified later.

##### COMPETITION RULES:

1. Undergraduate engineering students within the UAE are eligible for this competition.
2. Each institution can submit a maximum of two mini hydraulic lift for judging in this competition. Each competition team should have no more than five students.
3. The target (shelves and loads) are provided by the organizers (shown in fig.1, fig.2). The system and the load will be settled on the floor without additional tables. Each of the three loads is placed on a straight line aligned with both the hydraulic lift on one side and the shelf on the other side. The distance is fixed to 30 cm between the lift and load. On contrary the horizontal distance between each load and its corresponding shelf depends on the load weight and the shelf

height as explained in the detailed description section. Each load-shelf pair has a new starting point to place the hydraulic lift at.

4. The system will be tested with six load transfers, with two transfer trials for each load and the corresponding specific shelf at one distance as shown in fig. 3 (two transfers for each load-shelf pair at each distance). The best trial for each load-shelf pair will be considered for grading purpose.

5. Before each transfer, the students are allowed to make adjustments to the lift and place at the starting point aligned in a straight line with both the starting point (depending on the transfer load-shelf pair to be performed) and the load to be carried. The base of the lift will NOT be allowed to cross the starting line (shown in Figure 3) on which we have the three starting points. After adjustments, the students leave the lift till the judges allow them to perform the transfer. During the lift, the students are allowed to control the lift manually WITHOUT moving the hydraulic lift from the starting point.

6. Each team will have for total ten minutes to finish all the six trials.

7. No additional parts are allowed to be added or removed from the lift during the adjustments between the transfers.

8. All material used in the systems must be safe, harmless and accessible to everyone in normal market. Systems should need no safety protection and no grid electricity

Figure 1

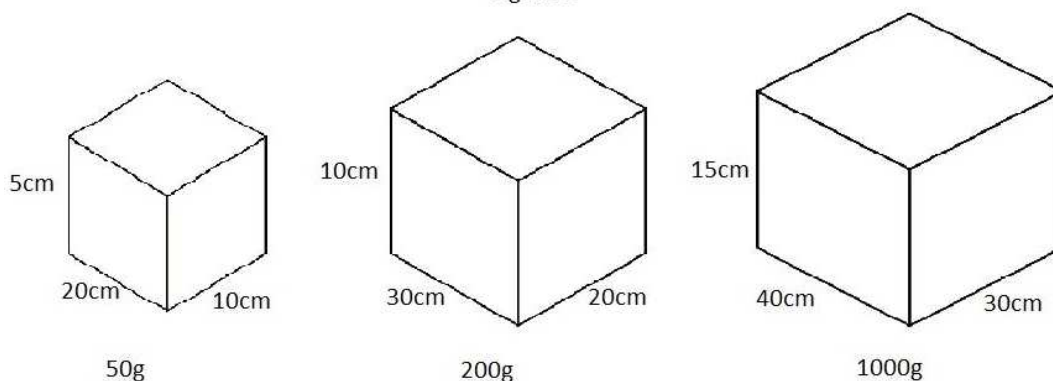


Figure 2

Side view

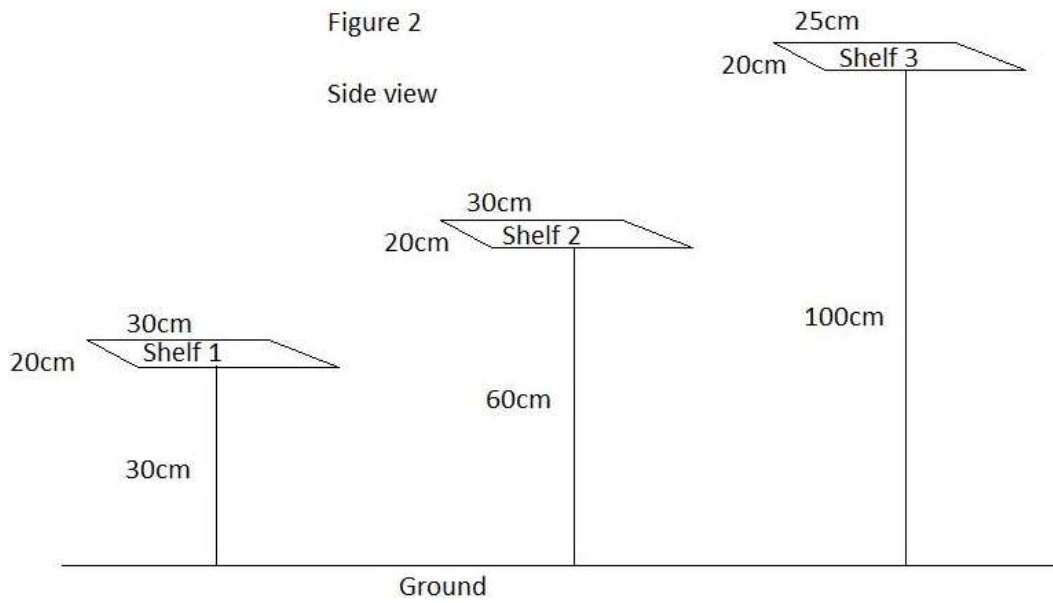
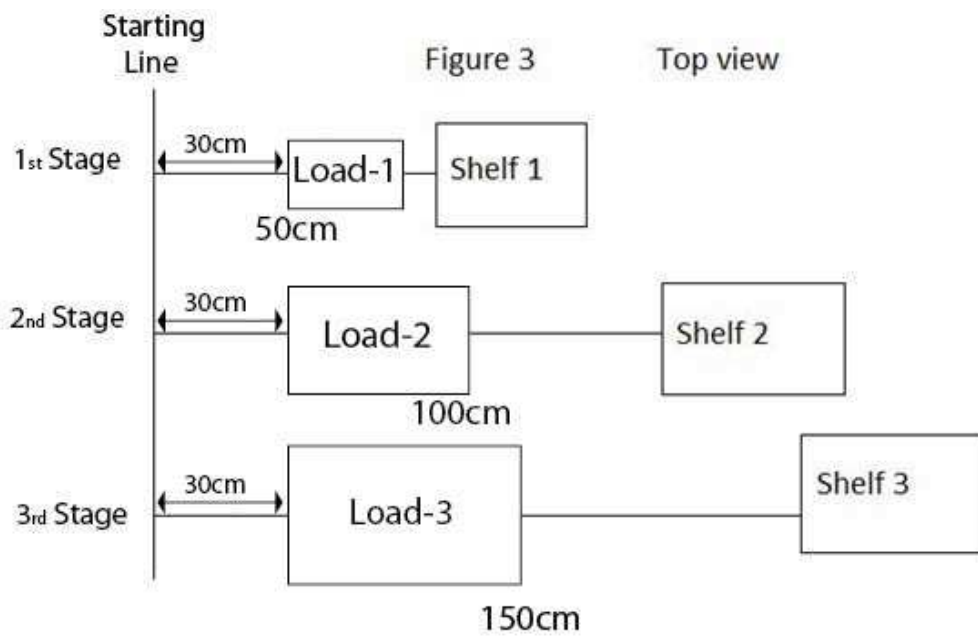


Figure 3

Top view



The scoring is in accordance with the criteria listed in the following table.

No.	Evaluation Criteria	Score (%)
1	Load-1 / Shelf-1	25
2	Load-2 / Shelf-2	35
3	Load-3 / Shelf-3	40
	Total	100

No.	Test Procedure
1	The team starts by placing the hydraulic lift on the ground aligned to load-1/shelf-1 pair. The base of the hydraulic lift shouldn't cross the starting line. A judge will inform the team to adjust the system and will initiate the stop watch. The judge will stop the watch as soon as the load-1 is placed steady on the shelf.
2	Each project team will be given two chances to complete each load/shelf pair lifting. The successful trial will only be considered. Successful trial will grant the team the score for the specified load/shelf pair.
3	Steps 1 and 2 will be repeated three times for each load/shelf pair.
4	Each project team will be given ten minutes for total including project setup and the two trials per load/shelf pairs X three load/shelf pairs.
5	<p>The best timing of the two trials per load/shelf pair will be considered.</p> <p>The total time for the three lifts (the best of the two trials of each) will be considered as the total time.</p> <p>The total time is used to differentiate between the teams to sort the ranking of them. The team with shorter total time will be in the first place and so on.</p>



**9<sup>th</sup> IEEE UAE STUDENT DAY**  
**2013-2014**  
**Common Design Project (CDP) Competition**  
**Quad-Copter Airshow**

**General Information**

1. Two teams from each institution can participate in the Common Design Project (CDP) competition.
2. Each team shall comprise a maximum of 5 IEEE student members.
3. Project cost must not exceed AED 3000.

**Project Definition**

The objective of this project is to successfully design, implement, and demonstrate a working prototype of automated synchronized quad-copter flight. A formation of two quad-copters must perform an air show guided solely by a personal computer. The two quad-copters are not permitted to have any physical connection (to each other or to the PC).

The air show will consist of two portions: a mandatory maneuver portions, and an acrobatics portion.

**Mandatory maneuver:** A closed path track (as shown in figure 1.a) will be designated on the ground with a single line of black tape. The track will have a start/finish point which is the lower left corner of Fig. 1.a. **ONE** quad-copter must hover at a minimum elevation of 100 cm and follow this track (as shown in figure 1.a). The mandatory maneuver will be scored out of 35 points.

**Acrobatic maneuver:** After completing the mandatory maneuver, the team must use **TWO** copters to perform synchronized acrobatic formations to showcase their design's abilities. 15 points will be allocated to this portion of the show.

**Requirements:**

1. Each team must use a formation of **ONE** quad-copter for the mandatory maneuver and **TWO** quad-copters for the acrobatic maneuver.
2. The air-show will be performed indoors.
3. The quad-copters must start from a resting position on the ground and must finish the air show by landing on the ground.
4. A net with one meter height will be placed around the track for the show to ensure that after taking-off the height of quad-copter is at least one meter.
5. For the mandatory maneuver, the quad-copter should be operated only through a PC. **NO HUMAN INTERFERENCE IS ALLOWED ONCE THE SHOW STARTS.** the quad-copter should avoid crashing any of the walls, the ceiling or the floor and should land at the end of the air show.
6. For the Acrobatic maneuver, the quad-copters should be completely synchronized and operated only through a PC. **NO HUMAN INTERFERENCE IS ALLOWED ONCE**

- THE SHOW STARTS. The quad-copters should avoid crashing with each other, any of the walls, the ceiling or the floor and should land together at the end of the air show.
7. Quad-copter model “*Xinxun Intruder UFO X30*” should be used. Please see the references below for the required model. Any other quad-copter will be disqualified.
    - a. The PCB on the UFO X30 **MUST BE REMOVED** and replaced by the one designed and implemented by the students.
  8. The total cost of the project including the copters should not exceed 3000 DHS by any means. Extra expensive projects disqualify.
  9. Any necessary sensors should be fitted on the quad-copters by the team.
  10. ONLY a maximum of two-TX/RX (transceivers) connected to and placed within 2 meters from the laptop are allowed. No other hardware shall be interfaced to the laptop.
  11. Any suitable S/W programming platform can be used (MATLAB, LABVIEW, etc.), but each team shall be responsible to explain their written code in detail.
  12. Each team will be given **ten minutes in total** to do the demos and the setting up of the system. It is the team freedom to manage the given time among setting up the system and the two maneuvers.
  13. The route/track for the mandatory maneuver with important dimensions is shown in Fig. 1. On the day of competition, the track will be marked on the floor by 20 cm wide black tape on white background. The center of the quad-copters must hover exactly over the black tape. It is the duty of the judges to carefully observe track violations.
  14. Each deviation from the track will have a penalty (negative score) as specified in the formula below. Furthermore, any collision between the copters or any walls will also result in a penalty.
  15. At the start of the mandatory maneuver, the quad-copter will be placed on the ground in a straight line with the center of the lead copter exactly over the start/stop corner. Once the copter crosses the start/stop corner at the completion of the straight-line maneuver, the copter should land safely then start the second maneuver.
  16. For Acrobatic maneuver, the two quad-copters will take-off from ground to demonstrate their formations.

The Overall Score for the mandatory maneuver portion will be calculated using the following formula:

$$\text{Overall Score} = (35/\text{NT}) - \text{VIL}$$

where,

NT = Normalized Time, VIL = Violation

NT = Time taken by the team to complete the mandatory maneuver / Minimum time taken by the fastest team to complete the mandatory maneuver

VIL = There are three types of violations based on their severity and scored as follows:

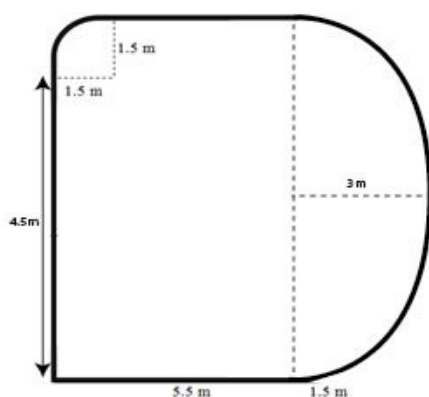
High\_VIL: High violation which has a weight of ten point deduction

Medium\_VIL: Medium violation which has a weight of seven point deduction

Low\_VIL: Low violation which has a weight of four point deduction

So, a team that takes the minimum time to complete the mandatory maneuver without any collision or track violation gets maximum 35 points.

Figure 1.a:



### Project Evaluation and Scoring

The IEEE UAE Students' Day Steering Committee will select a panel of judges to evaluate each project based on the following criteria:

1. Demonstration of the synchronized quad-copter air show in indoor environment.
2. Demonstration of additional related features of the developed system.
3. Interview of the team members concerning design and implementation aspects of the system.
4. Display of an A1 size poster describing the operation of the synchronized quad-copter air show and its salient features.

The scoring is in accordance with the criteria listed in the following table.

No.	Evaluation Criteria	Score (%)
1	Performance in the mandatory maneuver	35
2	Assessment of the acrobatic maneuver (including difficulty, originality, and the "wow" factor)	15
3	Design aspects	20
4	Theoretical knowledge	20
5	Poster describing the design, construction, and operation.	10
	Total	100

No.	Test Procedure
1	The team starts by placing the quad-copter on the ground in a straight line with the quad-copter's center exactly over the start corner. A judge will inform the team to switch on the system and will initiate the stop watch as soon as the quad-copter lifts off. The judge will stop the watch as soon as the quad-copter land at the end of the mandatory maneuver.
2	Each project team will be given two chances to complete the mandatory maneuver. The higher of the two Scores will be considered for final evaluation.
3	Each project team will be given a chance to show an acrobatic maneuver to demonstrate their talent in controlling two copters. There SHOULD be two copters for this maneuver and copters should start by taking off from and land safely after the maneuver to the same start corner.
4	Each project team will be given ten minutes for total including project setup and the two maneuvers.
5	After all teams finish the demos (10 minutes each), each team will have five minutes to Q/A by the judges.

## **References for the qualified quad-copter:**

<http://www.toy4sale.com/xinxun-xcx30-2.4ghz-4-axis-4-channel-rc-ufo-quadcopter>

<http://www.goodluckbuy.com/intruder-ufo-x30-60cm-2-4ghz-4ch-quadcopter-rc-model-airplanes-360-unlimited-eversion.html>

[http://image.dhgate.com/albu\\_355077685\\_00/1.0x0.jpg](http://image.dhgate.com/albu_355077685_00/1.0x0.jpg)

[http://image.dhgate.com/albu\\_355082049\\_00-1.0x0/new-arrival-51cm-2-4ghz-4-5ch-6-axis-gyro.jpg](http://image.dhgate.com/albu_355082049_00-1.0x0/new-arrival-51cm-2-4ghz-4-5ch-6-axis-gyro.jpg)

<http://p.globalsources.com/IMAGES/PDT/B1064233269/RC-Toy.jpg>

**9<sup>th</sup> IEEE UAE STUDENT DAY****2013-2014****Software Engineering Project (SEP) Competition****Speech to Sign Language Translator****GENERAL INFORMATION:**

In this project, a computer-based translator will be developed to translate voice instructions into sign language display (speech to sign language). Individual words or sentences made of maximum four words from the lists of words given in the Appendix will be spoken and the program will translate these into sign language display. For this competition, American Sign Language (ASL) will be used. The display can be on a PC, laptop, tablet or smart phone. Also, the output could be in the form of video clips or animation. For the verbs, as given in List I of the Appendix, present, past, and future tenses can be used. Also, nouns can be singular or plural. There is no restriction on the language(s) used for developing this software. The students can also use freely available libraries or ready-made modules for speech recognition. For display of sign language, they can either use their own video clips or simulations or they can utilize some available video clips/simulations. The testing procedure and evaluation criteria are explained at the end of this document.

**COMPETITION RULES**

1. Only IEEE student members within the UAE are eligible for this competition.
2. Each institution can submit a maximum of two entries in this competition.
3. Each competing team shall have no more than three students.
4. The contestants shall not use any unauthorized or unlicensed software.
5. The source code and all relevant documentation shall be made available to the competition coordinator and the judges on the day of the competition.
6. Salient features of the software shall be documented with the aid of an A1 size Poster. A brief (up to 2 pages) user manual shall also be provided.

**The software will be judged in the following categories:****1. Functionality**

- Does the application work?
- Does the software recognize a single word?
- Does the software recognize a sentence of up to four words?
- Can the software translate a single word into sign language?
- Can the software translate a single sentence of up to four words into sign language?

- How fast it takes the software to recognize speech?
- How accurate the sign language is displayed by the software?
- Does the software help users to learn sign language?

## **2. Theoretical Knowledge**

- Can the students show sufficient understanding of the speech to sign language software?
- Can the student explain how to utilize and tune a speech recognition tools?
- Can the students show sufficient understanding of the methodology and designing process they used for developing their speech to sign language software?
- Did the students identify and understand the system capabilities and limitations?
- Can the students demonstrate understanding of how they can extend the system capabilities and overcome the limitations?

## **3. User-Friendly Interface**

The design will be graded upon the following factors:

- What is the users' perception of the developed software? (clear interface, options, and appropriate visual elements)
- What can users do with it? (For example, a built-in help feature, or start-up splash screen to introduce the program for the first-time users).
- Is there a seamless integration between the different functionalities implemented and the user interface?

## **4. Design and Innovation in the software**

- What evidence of innovation is there in the speech to sign language software? What libraries or ready-made modules were used?
- Is the idea innovative?
- Did the system make use of some special features to help in translation for sign language?

## **5. Additional Features**

The students are encouraged to add other features to their software to enhance its purpose and use. There are 10 points for additional features as mentioned in the Evaluation Form.

## **6. Poster and User Manual**

The students are required to provide:

1. A brief (up to 2 pages) user manual.
2. An A1 size poster to provide a concise software description, and depict the technical specifications, methodology, tools and techniques used in the development of the software.

## **Software Testing**

In the first phase of testing, student teams will be asked to demonstrate their software. The judges, on the day of the competition, will prepare a list of 10 words, five sentences of two or three words, and five sentences of four words. Each team will demonstrate their software using the same words and sentences as decided by the judges on the day of the competition. After that the judges will test the software in a way that is uniform for all teams. The judges will also ask questions concerning the theoretical knowledge related to the developed software, user-friendly interface, design and innovation. They will also evaluate the poster and brief user manual. Each team will be then given 5 minutes to explain/demonstrate additional features of their software.

## **Evaluation Form:**

No.	Evaluation Criteria	Weight	1 <sup>st</sup> Judge	2 <sup>nd</sup> Judge	3 <sup>rd</sup> Judge	Total
1	Functionality	40%				
2	Theoretical Knowledge	10%				
3	User-friendly Interface	15%				
4	Design and Innovation	15%				
5	Additional Features	10%				
6	Poster and User Manual	10%				
	Total	100%				

# **APPENDIX**

## **Lists of Words**

### **List I – Verbs**

Do, Bring, Make, Finish, Put, Help, Serve, Guide, Eat, Drink, Show, Wear, Leave, Arrive, Wait, Sit, Stand, Walk, Run, Have, Give, Get

### **List II - Greetings**

Yes, no, may be, hello, goodbye, name, friend, how are you?  
Good, bad, thank you, you are welcome, excuse me, please, never, some, can't (cannot)

### **List III - Pronouns**

He (him), she (her), we (us), I (me), you, they (them), my, your, his, hers, theirs, myself, yourself, herself, himself, themselves, another, someone, this, that, people, person

### **List IV - Opposites**

Always/never, right/wrong, strong/weak, warm/cool, hot/cold, true/false, up/down, agree/disagree  
best/worst, same/different, find/lose, easy/hard, can/cannot, with/without, tall/short, before/after  
come/go, open/close, large/small, start/stop, new/old, slow/fast, dry/wet, clean/dirty,  
exciting/boring, beautiful/ugly, light/dark, long/short, soft/hard

### **List V - Time**

Second, minute, hour, day, week, month, year, today, tomorrow, yesterday, morning, noon  
afternoon, night, daily, forever, next, until, days of the week (Saturday, Sunday, ...Friday)

### **List VI - Colors**

Color, red, orange, yellow, green, blue, purple, pink, white, grey, black, brown, gold, silver

### **List VII - Questions**

Who, What, When, Where, Why, How, Which, Is, Are, Am, May, Do, Was, Were



### **List VIII - Clothes**

Skirt, hat, pants, shoes, shirt, coat, purse, umbrella, pocket, watch, socks, scarf

### **List IX - Family**

Family, parents, mom, dad, grandmother, grandfather, woman, man, boy, girl, baby  
brother, sister, husband, wife, uncle, aunt, niece, nephew, cousin, child, children

### **List X - Around the house**

House, home, door, floor, wall, window, key, room, bedroom, bathroom, kitchen  
furniture, chair, table, bed, telephone, refrigerator, computer, lamp, stairs  
Water, bread, fruit, juice, apple, banana, milk, food

### **List XI - Numbers**

Numbers from 1 to 10 (1, 2, ..., 10)

### **Examples**

Single Words: Hat, hello, green, kitchen, brother, next, never, yes, dirty, stop, run, ....

Sentences of two or three Words: How are you? My umbrella, Wear your shoes, Help me, Who helped me? He ran, We shall arrive, They walked, Wait four minutes, eight shirts, Eat your apple, He cannot sit, They drank milk, He closed windows, Will they leave? Wet floor, I am tall ...

Sentences of four Words: Where is your home? Did you eat apple? We shall drink juice, When did you leave? What is this color? Bring me two apples, Show me your watch, You shall make beds, Are your parents home? He guided his children, ...

## **7<sup>th</sup> IEEE UAE STUDENT DAY**

### **2011-2012**

### **Common Design Project (CDP) Competition**

## **ROBO-GOALKEEPER**

#### **General Information**

1. Two teams from each institution can participate in the Common Design Project (CDP) competition.
2. Each team shall comprise a maximum of 5 IEEE student members.
3. Project cost must not exceed AED 3000.

#### **Project Definition**

The objective of this project is to successfully design, implement, and demonstrate a working prototype of a “robo-goalkeeper” that will detect an incoming ball, identify its position as it approaches the goal, and then utilize a mobile mechanism to block it from entering the goal. The shape and type of the robo-goalkeeper are left to the imagination of the competing teams. However, it must satisfy the surface area requirement given below. A total of 5 attempts will be made to score a goal and for each goal saved by the robo-goalkeeper, it will earn 10 points. The remaining 50 points are based on its design considerations, creativity, additional features, poster, etc. as specified below. The robo-goalkeeper with highest total score will win the competition.

The goal size for this competition will be 2m wide and 1m high. The maximum surface area of the robo-goalkeeper facing the incoming ball will be 15% of the surface area of the goal at the goal-line, i.e.  $0.3 \text{ m}^2$  (3000  $\text{cm}^2$ ). The ball chosen for this competition is like a football but almost half its size (mini-football). It is available from Sun and Sand Sports. It's called Nike Skills LFP and its number is NEQP-SC1976-830 (Orange colour). This would avoid the disadvantages of both football (very heavy and thereby requiring very strong structure for robo-goalkeeper) and plastic balls (limited speed and lesser control on movement). It can be conveniently thrown with hand with good control on its speed. Throwing by hand gives more control than kicking it. The ball will be thrown by one of the judges from a distance of 8m from the goal-line with his arm at  $90^\circ$  w.r.t. the floor (vertical position). It will be either thrown directly towards the goal without hitting the floor or it will be thrown such that it first hits the floor in a specified zone (marked by two parallel lines; one at a distance of 2m and the other at a distance of 3m in front of the goal) and then moves towards the goal after the bounce. The exact type(s) of throws will be decided by the Steering Committee on the day of the competition. The objective is to make the testing as uniform as possible for all participating teams.

**Project Evaluation and Scoring**

The IEEE UAE Students' Day Steering Committee will select a panel of judges to evaluate each project based on the following criteria:

1. Demonstration of the robo-goalkeeper operation in indoor environment. The “play-ground” for this competition will be 10mx4m and separated from the spectators by 1m high white cardboards all around to minimize distractions for the robo-goalkeeper.
2. Demonstration of additional related features of the robo-goalkeeper.
3. Interview of the team members concerning design and implementation aspects of the robo-goalkeeper.
4. Display of an A1 size poster describing the operation of the robo-goalkeeper and its salient features.

The scoring is in accordance with the criteria listed in the following table.

No.	Evaluation Criteria	Score (%)
1.	Consideration of different alternatives in design and implementation and explanation for selecting the one used in the presented prototype.	10
2.	Demonstration of creativity and uniqueness of design and implementation.	15
3.	Performance of robo-goalkeeper in the competition.	50
4.	Demonstration of additional related features.	15
5.	Poster describing the design, construction, and operation.	10
	<b>Total</b>	<b>100</b>

No.	Test Procedure
1.	A judge will throw the ball towards the goal five times, from the specified distance, as explained above. The performance of the robo-goalkeeper (Criterion #3) is dependent on the number of saved goals. Each saved goal earns 10 points. If a ball thrown by the judge is outside the goal area, it will not be counted and the ball shall be thrown again.
2.	Each project team will be given 5 minutes to demonstrate additional features.

Evaluation Criteria No. 4 gives points for additional features that may include the following:

1. Reduced power consumption
2. Portability (reduced weight, size, etc.)
3. Efficient processing of information
4. Effectiveness of robo-goalkeeper under different operating conditions.

**IEEE UAE STUDENT DAY**  
**2011-2012**

**Engineering Design Project (EDP) Competition**

**Wind Powered Waterwheel**  
**(Wind Powered Water Lifting System)**

**GENERAL INFORMATION**

This competition is intended to give students an opportunity to explore the art, science and hence infinite possibilities of system design. The objective of this project is to build a cost-effective and efficient wind powered waterwheel that lifts water between two levels.

Students in the first/second year of their engineering education are particularly encouraged to participate. They will be able to show their creativity, innovative designs and have fun!

A panel of three judges, to be selected by the IEEE UAE Students Day steering committee, will assess the entries to the competition. The competition rules, the criteria that will be used for judging the entries and the evaluators form are given below.

**COMPETITION RULES:**

1. Undergraduate engineering students within the UAE are eligible for this competition.
2. Each institution can submit a maximum of two wind powered water lifting systems for judging in this competition. Each competition team should have no more than five students.
3. The system will be tested for 6 minutes in door using one fan that generates “wind” at three different speeds (Time starts when the fan is turned ON giving 2 minutes for each speed starting with the lowest speed). The fan is provided by the organizer with specifications shown in **fig.1**.
4. The setting of the filled lower tank and upper empty tank is provided by the organizer. The details of the setting are shown in **fig.2**.
5. The minimum distance between any part of the system and the fan should be at least 190 cm.
6. All material used in the systems must be safe, harmless and accessible to everyone in normal market. Systems should need no safety protection and no grid electricity
7. Electric or electronic components are not permissible.
8. The cost details of the system components should be prepared and presented by each team.
9. Each team will be given 5 minutes to demonstrate all aspects of their system.
10. Each system dimensions are limited to 100 cm width, 100 cm length, and 180 cm height.

11. Each system will be assessed based on the volume of the water it lifts in the testing time, its cost, and the innovation in the design.

## CRITERIA FOR JUDGING GAMES:

Criteria	Weight	Score
Volume of the lifted water	70%	
Cost	20%	
Innovation	10%	
Overall Score		

$$\text{Volume of lifted water} = \left( \frac{\text{Volume of lifted water in 6 min}}{\text{Maximum Volume of lifted water in 6 min}} \right) \times 70$$

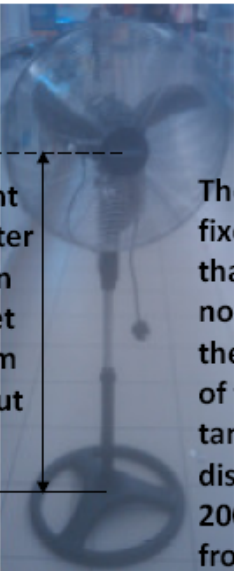
$$\text{Cost} = \left( \frac{1.2 \times \text{Maximum Cost} - \text{System Cost}}{1.2 \times \text{Maximum Cost} - \text{Minimum Cost}} \right) \times 20$$

*Innovation and efficiency:* In this criterion the judges will be looking for innovative efficient designs and for the ability of the team members to explain the operation of their system.

**The Wind Powered Water Lifting System with higher score will win the higher place.**

**“Wind Generating” Fan**  
**KENWOOD IF560 -- 90 Watt Power**  
**Three Speed Settings**  
**High Speed Ventilator**

Note: The fan is available in Carrefour, Lulu,...etc

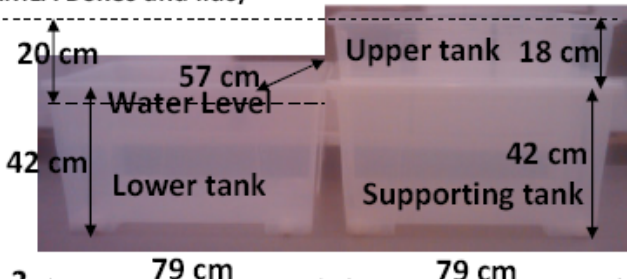


**Fig. 1**

**Upper and lower tanks' specifications**

- (1) The lower tank (LHS) dimensions are 79 x 57 x 42 cm (filled with water up to the shown level at the beginning of the test)
- (2) The upper tank (RHS) dimensions are 79 x 57 x 18 cm (empty at the beginning of the test)
- (3) The upper tank is supported by an empty tank (with a lid) similar to the lower tank
- (4) At the beginning of the test for each team the height difference between the upper edge of the upper tank and the water level in the lower tank equals 20 cm.
- (5) At the end of the test, the water lifted will be measured

Note: The tanks are available in IKEA Dubai Festival City (SAMLA Boxes and lids)



**Fig. 2**

**IEEE UAE STUDENT DAY**  
**2011-2012**

**Engineering Design Project (EDP) Competition**

**Wind Powered Waterwheel**  
**(Wind Powered Water Lifting System)**

**GENERAL INFORMATION**

This competition is intended to give students an opportunity to explore the art, science and hence infinite possibilities of system design. The objective of this project is to build a cost-effective and efficient wind powered waterwheel that lifts water between two levels.

Students in the first/second year of their engineering education are particularly encouraged to participate. They will be able to show their creativity, innovative designs and have fun!

A panel of three judges, to be selected by the IEEE UAE Students Day steering committee, will assess the entries to the competition. The competition rules, the criteria that will be used for judging the entries and the evaluators form are given below.

**COMPETITION RULES:**

1. Undergraduate engineering students within the UAE are eligible for this competition.
2. Each institution can submit a maximum of two wind powered water lifting systems for judging in this competition. Each competition team should have no more than five students.
3. The system will be tested for 6 minutes in door using one fan that generates “wind” at three different speeds (Time starts when the fan is turned ON giving 2 minutes for each speed starting with the lowest speed). The fan is provided by the organizer with specifications shown in **fig.1**.
4. The setting of the filled lower tank and upper empty tank is provided by the organizer. The details of the setting are shown in **fig.2**.
5. The minimum distance between any part of the system and the fan should be at least 190 cm.
6. All material used in the systems must be safe, harmless and accessible to everyone in normal market. Systems should need no safety protection and no grid electricity
7. Electric or electronic components are not permissible.
8. The cost details of the system components should be prepared and presented by each team.
9. Each team will be given 5 minutes to demonstrate all aspects of their system.
10. Each system dimensions are limited to 100 cm width, 100 cm length, and 180 cm height.

11. Each system will be assessed based on the volume of the water it lifts in the testing time, its cost, and the innovation in the design.

## CRITERIA FOR JUDGING GAMES:

Criteria	Weight	Score
Volume of the lifted water	70%	
Cost	20%	
Innovation	10%	
Overall Score		

$$\text{Volume of lifted water} = \left( \frac{\text{Volume of lifted water in 6 min}}{\text{Maximum Volume of lifted water in 6 min}} \right) \times 70$$

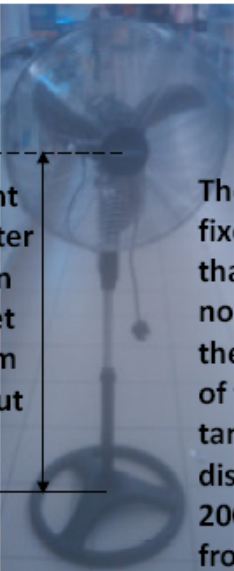
$$\text{Cost} = \left( \frac{1.2 \times \text{Maximum Cost} - \text{System Cost}}{1.2 \times \text{Maximum Cost} - \text{Minimum Cost}} \right) \times 20$$

*Innovation and efficiency:* In this criterion the judges will be looking for innovative efficient designs and for the ability of the team members to explain the operation of their system.

**The Wind Powered Water Lifting System with higher score will win the higher place.**

**“Wind Generating” Fan**  
**KENWOOD IF560 -- 90 Watt Power**  
**Three Speed Settings**  
**High Speed Ventilator**

Note: The fan is available in Carrefour, Lulu,...etc

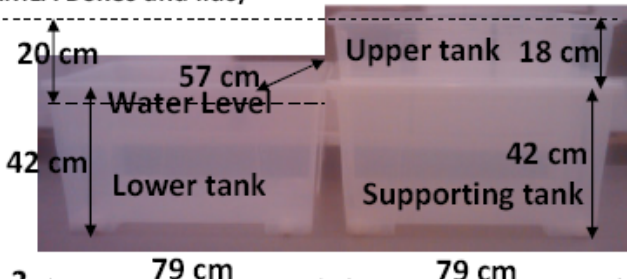


**Fig. 1**

**Upper and lower tanks' specifications**

- (1) The lower tank (LHS) dimensions are 79 x 57 x 42 cm (filled with water up to the shown level at the beginning of the test)
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- (4) At the beginning of the test for each team the height difference between the upper edge of the upper tank and the water level in the lower tank equals 20 cm.
- (5) At the end of the test, the water lifted will be measured

Note: The tanks are available in IKEA Dubai Festival City (SAMLA Boxes and lids)



**Fig. 2**



**7<sup>th</sup> IEEE UAE STUDENT DAY****2011-2012****Software Engineering Project (SEP) Competition****Secure Mobile Door Opening System****GENERAL INFORMATION:**

This project is an interdisciplinary one, where we encourage students from different backgrounds (communication, electronics, computer, or computer science) to be involved in every participating team. In this project, a mobile phone will be used to securely open doors using built-in Bluetooth technology.

An application will be implemented using Android development kit or any other platform on a smart mobile phone with Bluetooth communication protocol. This application will control the operation of opening and closing doors. In addition, it will implement security features that can be easily edited by enabling or disabling security, or changing PIN access code. The same mobile application can be used to control multiple doors (home, office, etc.). The developed prototype system will include two parts, the first one is software running on a smart phone, and the second one, is a model for the door. This model can be either a hardware one implemented using a rotation motor or visual software model implemented on a PC to simulate door open and close operations.

**PROCEDURE**

1. Conduct a survey about the keyless wireless-based door control system.
2. Understand mobile phone programming.
3. Understand the Bluetooth protocol, and how to send commands using your smart phone into another device with a Bluetooth interface.
4. Design and implement a door model (in hardware or software) that is controlled (open/close operations) using an appropriate Bluetooth-based controller.
5. Integrate a Bluetooth modem device to the door controller (the rotation motor or the PC running the simulation).
6. Design and implement appropriate mobile software that can communicate with the door controller using Bluetooth protocol.
7. Design an appropriate GUI for the software.
8. Implement security feature to identify user authority, i.e. the door controller will respond only after the user enters an appropriate PIN.



**COMPETITION RULES**

1. Only IEEE student members within the UAE are eligible for this competition.
2. Each institution can submit a maximum of two entries in this competition.
3. Each competing team should have no more than three students.
4. The contestants shall not use any unauthorized or unlicensed software.
5. The source code and all relevant documentation should be made available to the competition coordinator and the judges on the day of the competition.
6. The software, hardware and documentation must be displayed and demonstrated on the day of the competition with the aid of an A1 size Poster.

**The software and hardware will be judged in the following categories:****1. Functionality**

- Does the mobile software work?
- Does the door (hardware or software) model work?
- Do the mobile software and the door model work together as expected?
- Can the software send control commands to close/open the door?
- Can the door model detect these commands to open/close the door?
- Is security implemented in the design?
- Does the system work within appropriate distance?

**2. Theoretical Knowledge**

- Can the students show sufficient understanding of the door controller (hardware or software)?
- Can the students show sufficient understanding of the Bluetooth communication protocol including frequency, modulation, power, and range?
- Can the students show sufficient understanding of programming the Bluetooth chips in the mobile platform and in the door model controller?
- Can the students show sufficient understanding of the methodology and designing process they used to implement the mobile software?
- Did the developers identify and understand the system capabilities and limitations?
- Can the students demonstrate understanding of how they can extend the system capabilities and overcome the limitations?

**3. User-Friendly Interface**

The design will be graded upon the following factors:

- What is the users' perception of the product? (clear interface, options, and appropriate visual elements)
- What can users do with it? (For example, a built-in help feature, or start-up splash screen to introduce the program for the first-time users).

- Is there a seamless integration between the different functionalities implemented and the user interface

#### **4. Complexity and Innovation in the software**

- What evidence of innovation is there in the mobile software? What libraries or ready modules were used?
- Is the idea behind the door model innovative?
- Did the system make use of special features in the phone?
- How is security achieved? Can encryption features be added?

#### **5. Creativity**

The developers are encouraged to design easy to use software; in addition they can make use of certain features in mobile phones to ease the user interaction with the software. For instance, they can use the smart phone gravity sensor to take commands from user.

#### **6. Adaptability**

The system can be switched into manual operation based on physical key or appropriate software command in case of emergency?

#### **7. Documentation and Poster**

- The students are required to provide:
  1. A user manual that documents the application and provide clear use-cases. (Please don't print the code)
  2. An A1 size poster to provide a concise software and hardware description, and depict the technical specifications, methodology, tools & techniques used in the development of the system.

**Evaluation Form:**

No.	Evaluation Criteria	Weight	1 <sup>st</sup> Judge	2 <sup>nd</sup> Judge	3 <sup>rd</sup> Judge	Total
1	Functionality	30%				
2	Theoretical Knowledge	10%				
3	User-friendly Interface	20%				
4	Complexity & Innovation	10%				
5	Adaptability	10%				
6	Creativity	10%				
7	Documentation and Poster	10%				
	<b>Total</b>	<b>100%</b>				