

19 & 20

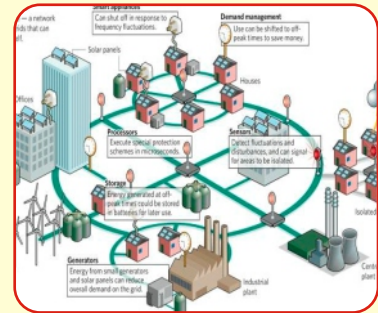
May, 2017

Karachi, Pakistan

IEEC
2017

Abstract Book

2nd International Electrical Engineering Conference (IEEC-2017)



Innovation and Advances in Electrical Engineering

Jointly Organised by

The Institution of Engineers Pakistan

Karachi Centre



NED University of Engineering & Technology

Karachi

in collaboration with



Bahria University



Balochistan University of
Information Technology
Engineering & Management
Sciences (BUITEMS)



Hamdard University



Indus University



Pakistan Navy
Engineering College - NUST



Sir Syed University
of Engineering &
Technology



Usman Institute of Technology



IEEE Power & Energy Society
(Karachi Chapter)



The Institution of
Engineering and Technology
(Karachi Chapter)



The Institution of Electrical
& Electronics Engineers Pakistan
(Karachi Chapter)

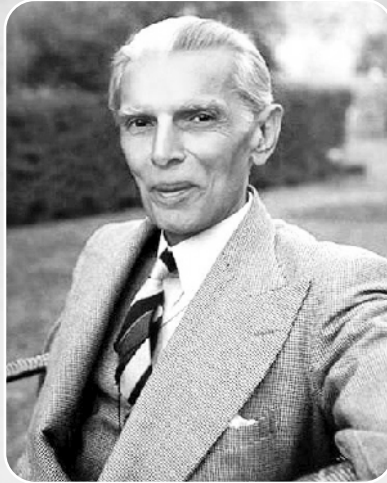


Federation of Engineering Institutions
of South & Central Asia (FEISCA)



Federation of Engineering
Institutions of Islamic
Countries (FEIIC)

*Quaid-e-Azam's message to the first inaugural meeting of
the Institute of Engineers Pakistan on 20th June 1948.*

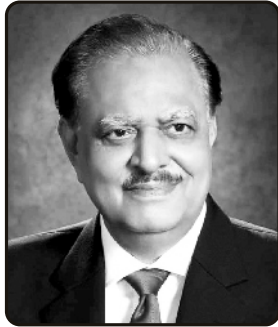


*"If Pakistan is to take its proper place among the progressive
nations of the world, it will have to take up a good deal
of leeway in the realm of scientific and technical education
which is so necessary for the proper development of the country and
the utilization of its resources. The establishment of institution like the
Institute of Engineers will greatly stimulate technical research
and help in disseminating available information.*

*The Institute of Engineers will not only benefit the
engineers themselves by improving their technical knowledge
but also bring lasting benefits to public services
which they are called upon to perform.*

I wish the Institute every success"





**President
Islamic Republic of Pakistan**

It gives me great pleasure to know that the Institution of Engineers Pakistan (IEP) Karachi Centre and NED University of Engineering & Technology in collaboration with Federation of Engineering Institutions of Islamic Countries (FEIC), Federation of Engineering Institutions of South & Central Asia and other leading engineering educational institutions of the country are organizing the 2nd International Electrical Engineering Conference (IEEC-2017) on 19th & 20th May, 2017 in Karachi, on the theme "Innovation and Advances in Electrical Engineering". I am glad to know that a large number of engineers from foreign countries would also be participating in the conference which would provide an opportunity to our engineers to have candid exchange of ideas and share each other's experiences to update their knowledge and learn from their peers in this profession.

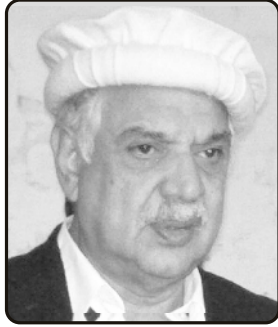
With advancements and progression in technology, many are excited to see what future developments can be especially in the field of electrical engineering. These innovations have a multitude of applications which help to improve many different facets of everyday life. This has led to exceptional improvement in the productivity and efficiency of the industrial as well as services sectors, thus setting the stage for further innovative developments all over the world.

It is necessary to enhance the quality of products with value addition by benefitting from innovations in Electrical Engineering. I sincerely hope that the young generation of engineers in the country, working in the field of Electrical Engineering will devote themselves to the development of electrical science and technology in order to revitalize Pakistan's industry. I am confident that this assembly of engineers would prove to be a curtain raiser for the future industrial growth and development in the country.

I hope that the Institution of Engineers Pakistan and other engineering institutions of the country will come up to the expectations of the stakeholders and help realize the dream of a technologically advanced country. I am confident that our engineers will continuously strive to excel in the fields of engineering and this event will provide good opportunity to them to interact with foreign delegates and strengthen their knowledge base, thus making them more productive for the sectors they are working in.

I commend the role of the Institution of Engineers Pakistan in promoting engineering sciences in the country and wish them and other organizers every success in their future endeavors.

Mr. Mamnoon Hussain
President
Islamic Republic of Pakistan



Governor of Khyber Pakhtunkhwa

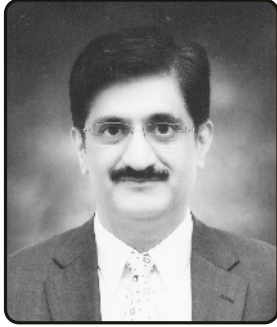
It is a matter of great pleasure to learn that The Institution of Engineers Pakistan Karachi Centre and NED University of Engineering & Technology are organizing the 2nd International Electrical Engineering Conference (IEEC-2017) on 19th & 20th May, 2017 at IEP Convention Center, in collaboration with Federation of Engineering Institutions of Islamic Countries, Federation of Engineering Institutions of South & Central Asia, Balochistan University of Information Technology, Engineering & Management Sciences, Bahria University, Indus University, Hamdard University, Usman Institute of Technology, Pakistan Navy Engineering College-NUST, Sir Syed University of Engineering & Technology, The Institution of Electrical & Electronics Engineers Pakistan, Karachi Chapter, IEEE Power & Energy Society, Karachi Chapter and The Institution of Engineering and Technology, Karachi Chapter

The activities of the Institution particularly its role towards the spread of technical knowledge are commendable, I hope that the Institution will strive hard to further increase the range of its services with national spirit and devotion to every nook and corner of the country.

The Institution of Engineers Pakistan has its Centres in various cities of Pakistan. I am told that the Institution of Engineers Pakistan has been holding Technical Lectures/ Conferences/ Congresses / Seminars / Symposiums / Exhibitions etc. throughout Pakistan. The role being played by the Institution in promoting the Science, practice and business of Engineering in all its branches throughout Pakistan are appreciated.

I wish The Institution of Engineers Pakistan and NED University of Engineering & Technology a real success.

Engr. Iqbal Zafar Jhagra
Governor of Khyber Pakhtunkhwa



Chief Minister Sindh

It is a matter of great pleasure to know that The Institution of Engineers Pakistan Karachi Centre and NED University of Engineering & Technology are organizing the 2nd International Electrical Engineering Conference (IEEC-2017) on 19th & 20th May, 2017 at IEP Convention Centre, in collaboration with Federation of Engineering Institutions of Islamic Countries, Federation of Engineering Institutions of South & Central Asia, Baluchistan University of Information Technology, Engineering & Management Sciences, Bahria University, Indus University, Hamdard University, Usman Institute of Technology, Pakistan Navy Engineering College-NUST, Sir Syed University of Engineering & Technology, The Institution of Electrical & Electronics Engineers Pakistan, Karachi Chapter, IEEE Power & Energy Society, Karachi Chapter and The Institution of Engineering and Technology, Karachi Chapter.

I am glad to learn that the Institution of Engineers Pakistan was established in 1948 with the blessing of the Father of Nation, Quaid-e-Azam Mohammad Ali Jinnah who in his message to first inaugural meeting of the Institution stressed "If Pakistan is to take its proper place among the progressive nations of the world it will have to take up a good deal of leeway in the realm of scientific and technical education which is so necessary for the proper development of the country and the utilization of its resources.

The Institution of Engineers Pakistan Karachi Centre (IEP) is a forum for the engineers, Academics, Developers and Researchers to discuss issues related to the adoption and use of rigorous tools for the specification analysis, verification, certification, construction, test and maintenance of systems from the point of view of their different application domains.

In particular, by providing a venue for the discussion of common problems requirements, algorithms, and methodologies and practices, IEP aims at supporting researchers in their quest to improve the utility reliability, flexibility and efficiency of tools for building systems and studies with a conceptual message and experimental papers, provide linkage between research and its use at large.

I wish every success for the Institution of Engineers Pakistan and NED University of Engineering & Technology and the conference.

Engr. Syed Murad Ali Shah
Chief Minister Sindh



Chairman Pakistan Engineering Council

I am pleased to know that The Institution of Engineers Pakistan (IEP) Karachi Centre and NED University of Engineering & Technology are organizing the 2nd International Electrical Engineering Conference (IEEC-2017) on the Theme "Innovation and Advances in Electrical Engineering".

Engineers play the most vital and important role in nation building. They create new inventions using innovative techniques to make human life more comfortable, secure and productive. This is the era where nations having rich experience in engineering and management are progressing economically. We have excellent potential to grow in engineering fields.

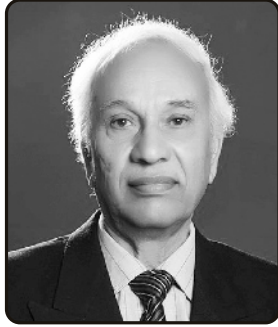
The IEP is one of the forums for engineers working in academia and industry to discuss engineering related issues and come out with suggestions for their applications.

I believe this Conference will provide the benchmark for continued improvement in overall development of the Electrical Engineering Profession. This Conference should be a source of inspiration and guidance for all the engineers, particularly the electrical ones.

I wish every success for the Institution of Engineers Pakistan and NED University of Engineering & Technology and the Conference.

Engr. Javed Salim Qureshi

Chairman
Pakistan Engineering Council



President The Institution of Engineers, Pakistan

It is a matter of great pride that The Institution of Engineers Pakistan Karachi Centre (IEP) and NED University of Engineering and Technology Karachi are holding 2nd International Electrical Engineering Congress on 19th and 20th May, 2017 at IEP Convention Center, Karachi in collaboration with National, International and Regional sister Engineering organizations.

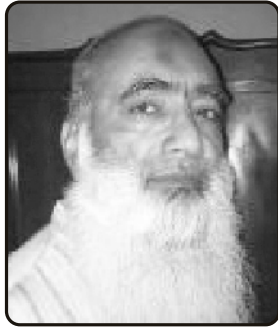
It is also a matter of great satisfaction that renowned experts from within the country and from abroad shall be presenting their valuable papers during the conference. This event will provide the opportunity to young Engineers to benefit from the knowledge of experienced Engineers in their relevant fields.

The Institution of Engineers Pakistan Karachi Center is working hard for dissemination of knowledge by holding National/International Engineering Congresses, Technical Seminars, Workshops and lectures for the benefit of Engineering profession and development of the Country.

The Chairman, Vice Chairmen, Secretary and Local Council Members of Karachi Center deserve appreciation for organizing the Engineering Congresses and Technical lectures on various Engineering topics for the benefit of engineering community.

I pray for the success of this 2nd International Engineering Congress.

Engr. Dr. Izhar Ul Haq
President,
The Institution of Engineers, Pakistan



Chairman
The Institution of Engineers Pakistan
Karachi Centre

Just after the successful completion of the 1st International Electrical Engineering Congress last year, the Joint Organizing Committee of The Institution of Engineers Pakistan, Karachi Centre and NED University of Engineering & Technology started working for the 2nd International Electrical Engineering Conference (IEEC-2017) scheduled for May, 2017. The efforts of the Joint Organizing Committee Alhamdo-Lillah culminated in making it possible for me to write this message and to welcome you all to this 2nd International Electrical Engineering Conference (IEEC-2017) on 19th and 20th May, 2017 at IEP Convention Centre, thus upholding the traditions of IEP of playing a vital role in the Development of the Nation within the periphery of its approved aims and objectives, mostly revolving around the promotion and advancement of the practice and application of the principles of science.

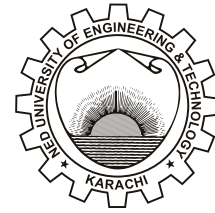
The Organizing Committee this time very rightly intensified their efforts for inducting more national academic institutions, which resulted in collaboration with, Baluchistan University of Information Technology, Engineering & Management Sciences (BUITEMS), Bahria University, Indus University, Hamdard University, Usman Institute of Technology, Pakistan Navy Engineering College-NUST, and Sir Syed University of Engineering & Technology apart from IEEE Pakistan, Karachi Chapter, IEEE Power and Energy Society, Karachi Chapter and the Institution of Engineering and Technology, Karachi Chapter. While the Federation of Engineering Institutions of Islamic Countries (FEIIC), Federation of Engineering Institutions of South and Central Asia (FIESCA) and IEP Head Office has always been standing behind such endeavors, however, the collaborative role of NED University of Engineering and Technology, through the Department of Electrical Engineering deserve special commendation.

I am confident that the high standard of the blind reviewed technical papers, its presentation and the valuable keynote addresses would indeed be of immense take home value, which shall speak volumes of the pain taken by all the valuable contributors inclusive of the Organizing Committee and the helping hand of IEP Karachi Centre.

Once again I welcome each one of the participants and my best wishes for the continuing success of all such events organized by IEP Karachi Centre in collaboration with academia and industry.

Engr. Prof. Dr. S. F. A. Rafeeqi, FIE(Pak)

Chairman
The Institution of Engineers Pakistan
Karachi Centre



Message
Vice-Chancellor
NED University of Engineering & Technology, Karachi

I witnessed the landmark success of IEEC-2016, which received encouraging and enthusiastic response from researchers, academia and industry locally and internationally. Now, it is a matter of great pleasure to see IEEC-2017 bringing people closer again to share their knowledge.

In future, one thing is certain that knowledge will become key resource and it is our utmost priority to generate ideas that will benefit society and equip people where they will be valued both for their specialized knowledge and for their ability to research, communicate and solve problems. To meet these challenges, collaboration of IEP and NED University of Engineering and Technology forms significant contributions in the continued excellence of learning, research and innovation. From the ideas and discussion of academic experts and professionals, who are contributing in the growth of engineering and technology, I hope that this conference will enrich the knowledge of the participants.

Today, we witness an ever increasing demand of energy, globally. World is gradually bringing number of alternate energy resources into the system, as it does not wish to depend solely on fossil fuels. Tremendous research has been conducted to explore possibilities of transforming every other form of energy into clean energy, i.e. the electricity. In Pakistan, the challenge of 'increased electricity demand' has almost transformed into crises. Short term solutions and lack of long term planning have resulted into schedules of 'load shedding' and frequent 'black-outs'. IEEC-2017 provides ideal opportunity for engineers and researchers to address these important challenges.

We live in a world, in which from social communities to currencies, every aspect of life is digital. We prefer computers for faultless accomplishment of tasks and minimize human intervention. We dream to inculcate human intelligence in computers, which is one of the most challenging task addressed by scientists and engineers. The horizon of the applications of electrical engineering has no limits. From human needs to dreams, I hope this conference would cover and address maximum possible aspects which will pave way for a better world.

At the end, I would like to congratulate the organizing team of IEEC-2017 for their indefatigable efforts and making this event possible.

Engr. Prof. Dr. Sarosh Hashmat Lodi
Vice Chancellor
NED University of Engineering & Technology



Vice Chancellor
Balochistan University of IT, Engineering
and Management Sciences (BUITEMS)

In view of the pressing needs of the nation in Electrical Engineering—particularly in energy generation and distribution, it is high time to organize and hold International Electrical Engineering Conference (IEEC'17). Electrical Engineering is, arguably, one of the most relevant engineering disciplines in the 21st century. The importance and utility of this field is not limited to any bounds but have reached a whole new level of global significance. Today, the world is looking forward to engineers and researchers in Electrical Engineering for the development of renewable energy, smart grids, next-generation telecommunications, micro and nano-electronic systems, mechatronics, electrical materials, and many other relevant fields. The IEEC'17 is being organized to discuss and highlight the advances in relevant areas which will be of great significance for our young researchers.

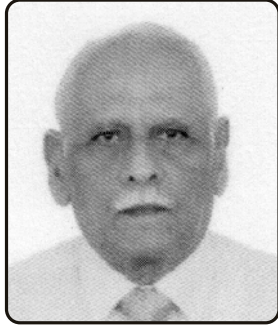
The conference is an excellent opportunity for researchers, engineers, and technocrats from all over Pakistan and abroad to participate and share their ideas in Electrical Engineering.

I acknowledge the hard work of organizers from the Institution of Engineers Pakistan (IEP), NED University of Engineering & Technology Karachi, Federation of Engineering Institutions of Islamic Countries (FEIC), Federation of Engineering Institutions of South & Central Asia (FEISCA), Bahria University, Hamdard University, Indus University, Usman Institute of Technology, Sir Syed University of Engineering & Technology, IEEE Karachi Chapter, Pakistan Navy Engineering College (PNEC-NUST) and Balochistan University of IT, Engineering and Management Sciences (BUITEMS) Quetta for their collaborative efforts for holding this conference.

On behalf of BUITEMS, I would like to extend my best wishes to all the participants and delegates and wish IEEC'17 a great success.

Engr. Ahmed Farooq Bazai (S.I)

Vice Chancellor
Balochistan University of IT, Engineering
and Management Sciences (BUITEMS)



Vice Chancellor
Sir Syed University of Engineering & Technology

I appreciate that the Institute of Engineers Pakistan (IEP) in collaboration with various other institutions has organized the 2nd International Electrical Engineering Conference on 19th & 20th May, 2017 at Karachi. The conference most likely would address an important national issue since as our country is faced with acute challenge of energy shortfall. As we all are aware, the phenomenon of climate change is a reality now and overall rise in global temperature is expected. The need to address energy crises has become so important as never in the past.

Consumption of electricity is generally considered as an index of economic prosperity and technological progress of a country. Pakistan as a developing country is experiencing growing demand for electricity. So far the progress to address this major issue is yet to bring visible improvements in service level. Pakistan's energy requirement is growing rapidly due to increase in population and high energy intensive industrial sector. There is enormous shortfall in demand and supply of electricity in the country. Demand for electricity is nearly 24,000 MW. Due to weak transmission and distribution system there is a short fall of over 6000 to 7000 MW requiring long hours of load shedding,

The mainstay of energy in Pakistan has always been fossil fuel using furnace oil. Fuel has to be imported using foreign exchange. The oil prices fluctuate with the passage of time and depending upon global economic conditions. With the rising fossil fuel prices, the cost of oil import is creating problem for foreign exchange reserves. The rising oil prices along, with the rising demand for uninterrupted power, is an additional pressure on the already fragile electricity grid of Pakistan.

Our country is yet to fully diversify our energy mix and reduce dependency upon use of furnace oil. Pakistan has potential for renewable sources of energy. Sindh-Baluchistan coastal belt has wind corridor and can be utilized to produce abundant wind energy. Pakistan is one of those countries that have sunlight throughout 365 days and solar energy could be another option. We are yet to fully utilize Thar coal reserves for energy generation. Northern part of country is rich for generation of hydro energy. We must develop renewable sources up to optimum level.

I am sure experts at the seminar would come up with some doable, pragmatic and cost-effective solutions to address problems prevailing in the energy sector on lasting basis.

Prof. Dr. Jawaid H. Rizvi
Vice Chancellor
Sir Syed University of Engineering & Technology



Secretary General The Institution of Engineers, Pakistan

It is matter of pleasure that The Institution of Engineers Pakistan Karachi Centre (IEP) and NED University of Engineering and Technology Karachi are holding 2nd International Electrical Engineering Congress on 19th and 20th May, 2017 at IEP Convention Center, Karachi in collaboration with National, International and Regional sister Engineering organizations.

The Institution of Engineers Pakistan is the premier body of Engineers in Pakistan and has made significant contributions to the development of the country. The role played by the Institution in dissemination of knowledge is highly commendable. Recent advancements in Science and Technology have placed enormous resources at our disposal which must be harnessed for the welfare of humanity. Pakistan possesses vast

natural resources and it is the duty of our scientists and engineers to utilize these for the welfare of the society and eradication of disease, ignorance, poverty and hunger.

I am sure the 2nd International Electrical Engineering Congress will provide an excellent opportunity to the participants to benefit from the experiences of one another and to find solutions to our current national problems.

I wish the Institution of Engineers Pakistan Karachi Centre and Participations of the Congress all the success.

Engr. Mian Sultan Mahmood
Secretary General,
The Institution of Engineers, Pakistan



**Chief Organizer, 2nd IEEC-2017
Member Executive Committee- FEIC &
Member Executive Committee-FEISCA**

It is a matter of pride for being Chief Organizer of the 2nd International Electrical Engineering Conference which is being jointly organized by The Institution of Engineers Pakistan, Karachi Center and NED University of Engineering & Technology, Karachi in collaboration with Baluchistan University of Information Technology, Engineering & Management Sciences, Bahria University, Indus University, Hamdard University, Pakistan Navy Engineering College-NUST, Sir Syed University of Engineering & Technology, Usman Institute of Technology, The Institution of Electrical & Electronics Engineers Pakistan-Karachi Chapter, IEEE Power & Energy Society-Karachi Chapter, The Institution of Engineering and Technology-Karachi Chapter, Federation of Engineering Institutions of Islamic Countries, Federation of Engineering Institutions of South & Central Asia and Federation of Engineering Institutions of Islamic Countries.

In this modern era, technological education and research are the tools that are being used to compete among the developed nations of the world. To meet these challenges, the faculty, research students of Engineering Universities of Pakistan along with the Institution of Engineers Pakistan have realized their role and are putting their efforts through dissemination of knowledge in this area. IEEC-2017 is one of such unique effort, Wherein, for the first time 12 National Universities/Institutions and 2 International Institutions have joined together to disseminate the ever expanding knowledge in the field of Electrical & Allied Engineering to its members/participants of IEEC-2017.

I would like to place on record my profound regards to the members of IEP Central & Local Council, Karachi Centre and Faculty Members of the Electrical Engineering Department- NEDUET particularly Engr. Prof. Dr. S.F.A Rafeeqi, Chairman, Engr. M. Idris Khan, Vice-Chairman (Elect.), Engr. Ayaz Mirza, Secretary of IEP, Karachi Centre, Engr. Prof. Dr. Saad A. Qazi, Dean, Engr. Prof. Dr. Muhammad Ali Memon Chairman, Engr. Dr. Riaz Uddin Conference Chair, Engr. Dr. Muhammad Mohsin Aman, Conference Co-Chair and the entire team of NED University of Engineering & Technology, Karachi for their guidance and efforts to hold IEEC-2017 in a befitting manner.

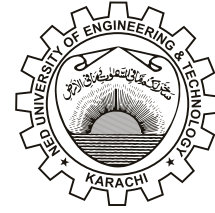
Today, we are proud to welcome all the distinguished guests, learned speakers and delegates from all over Pakistan and abroad in this 2nd IEEC-2017. I, take this opportunity to specially thank our distinguish Keynote speakers Prof. Ted Johansson, Electrical Engineering, Linkoping University, Sweden, Prof. Dr. Uwais Qidwai, Qatar University-Doha, Prof. Dr. Tahir Izhar of UET-Lahore who have spared their valuable time and traveled a long distance to participate in this Conference.

I am confident that the delegates attending this Conference will be benefited by the presentation to be made by the experts from all over Pakistan and abroad, and will be able to improve their knowledge in the relevant fields of Electrical Engineering.

My sincere gratitude are to Engr. Prof. Dr. Sarosh H. Lodi, Vice-Chancellor-NEDUET, Engr. Dr. Izhar ul Haq, President-IEP, Engr. Ahmed Farooq Bazai, Vice-Chancellor-BUITEMS, Rear Admiral Engr. Dr. Nassar Ikram SI(M)-Commandant, Pakistan Navy Engineering College, PNEC-NUST, Vice-Admiral (Retd) Khawaja Ghazanfar Hussain HI(M)-Bahria University, Karachi Campus, Engr. Prof. Dr. Wali Uddin, Dean FEST-Hamadard University, Engr. Prof. Dr. Syed Hyder Abbas Musavi, Dean FEST-Indus University, Engr. Prof. Dr. Shoaib Zaidi-Usman Institute & Technology, Engr. Commodore (R) Sarfraz Ali, Registrar, SSUET, Engr. Mian Sultan Mahmood, Secretary General, IEP for extending their help in organizing this IEEC-2017. I would also take this opportunity to appreciate the efforts of Mr. Sikander Mannan, Mr. Shareef Khan Qadri, Mr. Saif-ud-Din and all other staff members of IEP Karachi Centre for extending their full support for organizing IEEC-2017.

Engr. Sohail Bashir, FIE (Pak)

Chief Organizer, 2nd IEEC-2017
Vice-Chairman, IEP, Karachi Centre



Dean
Faculty of Electrical & Computer Engineering
NED University of Engineering and Technology

It is a pleasure to be writing again for IEEC conference 2017 – the follow up conference to a successful congress last year in 2016.

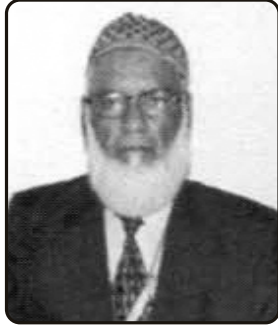
Last year, the aim was about bringing academic and industrial communities together for a couple of days for sharing ideas, discussing passions and charting innovations.

This year it should be about consolidation. To reflect on progress and gaps since last congress, and rekindle inspirations, motivations and resolutions through another round of exciting exchange of knowledge, ideas and thoughts in a rapidly changing world of electrical engineering.

The Institution of Engineering Pakistan, Karachi Centre and NED University of Engineering & Technology have yet again joined hands in organizing 2nd International Electrical Engineering Conference 2017. It is encouraging to see such overwhelming response to congress call.

I congratulate all the organizers for materializing such a great event though their dedicated efforts and wish all the authors, presenters and delegates a successful gathering.

Prof. Dr. Saad Ahmed Qazi
Dean
Faculty of Electrical & Computer Engineering
NED University of Engineering and Technology



**Dean
Faculty of Engineering
Sir Syed University of Engineering & Technology**

It is a matter of immense pleasure for me to note that the Institution of Engineers Pakistan is organizing the 2nd International Electrical Engineering Conference (IEEC-2017) on May 19-20, 2017) at Karachi in which all stakeholders and Universities of Engineering & Technology are collaborating and participating to make the event successful & memorable. The IEP continues to strive hard to give impetus and proper place to Engineering profession in Pakistan and abroad for a better tomorrow. The organizers of the event and participants both deserve a great applause for their endeavors to bring to limelight the latest innovations and advances in Electrical Engineering field for the comfort of human beings and to make this world a happy place to live in.

I congratulate all office bearers and organizers of the conference, particularly Dr. Izharul Haq, President IEP and Engr. Ayaz Mirza, Secretary IEP Karachi Centre for organizing the event in a befitting manner.

IEP has made tremendous progress in the recent past and besides expansion of its network nationally, it is now penetrating in the Middle East and America. Therefore, it is possible to have professional and academic collaborations worldwide.

The Conference envisages a dialogue in the core Electrical Engineering areas like Power Systems, Renewable Energy, Robotics, Control Systems, Automation, Artificial Intelligence, Telecommunication, ITC etc which will provide a platform for researchers, academicians and other professional of electrical engineering to interact, share knowledge & experience for common benefits.

I wish the Conference a great success and congratulate once again all its office bearers, organizers, stakeholders, participants and student community to be part of this historic event, which will leave a lasting impression on our minds.

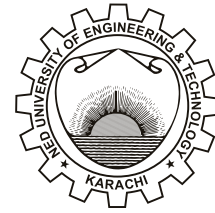
Talat Altaf
03/05/2017

Prof. Dr. Talat Altaf

Dean

Faculty of Engineering

Sir Syed University of Engineering & Technology



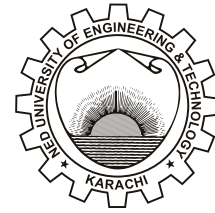
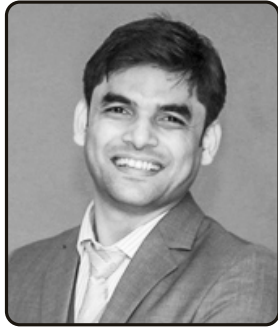
**Member Advisory Committee, IEEC 2017.
Chairman, Department of Electrical Engineering,
NED University of Engineering and Technology, Karachi.**

Various huge regional projects are in progress which will have major impact on the country economy. These projects will need high tech human resources including the Engineers, thus there is a growing need for academia-industry relationship. Any efforts in this regard need to be acknowledged and appreciated.

This conference has provided a platform to the academia, industry and the concerned stakeholders from various sectors having a wide variety of expertise to share the innovative ideas and contribute towards the needs of the regional projects and betterment of the society.

In fact IEEC is also excellent opportunity for networking and professional relationship, which will help academia, industry and concerned stakeholders to collaborate meaningfully to contribute towards the betterment of humanity.

Dr. Muhammad Ali Memon
Member Advisory Committee, IEEC 2017.
Chairman, Department of Electrical Engineering,
NED University of Engineering and Technology, Karachi.



Conference Chair
(IEEC 2017) and Assistant Professor in the
Department of Electrical Engineering
NED University of Engineering and Technology

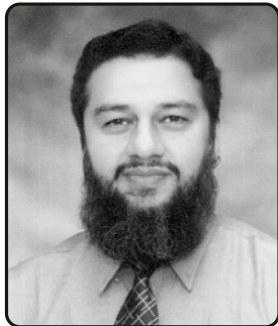
Population-wise, Pakistan is the sixth largest country of the world. Every nation around the world emerged as developed when they specifically focused on research and development pertaining to its societal and industrial needs majorly based on engineering and technology, which raised its standard of living as well. Similarly, to bring Pakistan among the top nations in the world, there is a need to swiftly promote the research and development culture here. In this context, events like IEEC play a vital role where research-oriented smart and innovative solutions are presented and debated by intellectuals for the betterment of the society and fulfill national needs. Specifically, talking about the Electrical Engineering and related fields, there is need to address issues in power sector industry (from renewable to smart and sustainable supply of energy), communication industry issues (from improved cellular to satellite communication), automobile and heavy industry (from mechatronics, automation and control to intelligent robotics), computer/software industry (from software innovation to cloud computing), electronics industry (from IC design to embedded systems development) and many more. The innovative solutions and researches obtained from the highlighted fields can directly influence advances in industries such as power, automobile, process, foods, textiles, house hold product, heavy, fertilizers etc., where smart solutions will be used for automated devices and set-ups performing collaborative tasks in order to save time, men power and energy, which will directly boost the socio-economic development of the country. Based on this ideology, IEEC (brought by IEP and NED) is motivated to play its active role as a platform to bring experts nationally and around the world to discuss their valuable ideas and researches in this event.

Following the footsteps of our past successful and landmark event (where I served as Co-convener IEEC 2016), the organizing Committee both from IEP and NED, not only continue this academic and professional Interaction through our 2nd International Electrical Engineering Conference (IEEC 2017) but also ensure a wide participation of intellectuals from all across Pakistan and from overseas.

This time as 'Conference Chair' IEEC 2017 and on behalf of the IEEC organizing team, I am honored and delighted to welcome you all to this IEEC 2017 event on the 'Innovation and Advances in Electrical Engineering'. IEEC is now emerging as an annual event, giving us an opportunity of immersing ourselves in groundbreaking research and innovations in electrical engineering and related fields. I believe IEEC-2017 is the venue that will guarantee a successful technical conference, which is aimed to bring all relevant stakeholders of electrical engineering and related fields under one umbrella.

Dr. Riaz Uddin

Conference Chair (IEEC 2017) and Assistant Professor
Department of Electrical Engineering
NED University of Engineering and Technology



Secretary
The Institution of Engineers Pakistan
Karachi Centre

I am honored to warmly welcome all of you to the 2nd International Electrical Engineering Conference (IEEC-2017) being jointly organized by The Institution of Engineers Pakistan Karachi Centre and NED University of Engineering & Technology on **19th & 20th May, 2017** at IEP Convention Center, 5th Floor, IEP Building, Shahrah-e-Faisal, Opposite: Hotel Regent Plaza, Karachi. This time our collaborators include Federation of Engineering Institutions of Islamic Countries, Federation of Engineering Institutions of South & Central Asia, Baluchistan University of Information Technology, Engineering & Management Sciences, Bahria University, Indus University, Hamdard University, Usman Institute of Technology, Pakistan Navy Engineering College-NUST, Sir Syed University of Engineering & Technology, The Institution of Electrical & Electronics Engineers Pakistan, Karachi Chapter, IEEE Power & Energy Society, Karachi Chapter and The Institution of Engineering and Technology, Karachi Chapter. Theme of this 2nd International Electrical Engineering Conference is **"Innovation and Advances in Electrical Engineering"**.

Electrical engineering deals with the theory and application of electricity. It is the most innovative and vibrant field of engineering. Indeed most of humanity's modern engineering achievements belong to electrical engineering. These include electric machines and electrification of the world, electronics, radio and television, computers, telephone and cellular phones, the Internet, image processing, laser and fiber optics, satellite communication, global positioning systems, medical equipment, domestic appliances, sensors and control systems used under water, space exploration and national security applications, among many other applications and discoveries.

It is hard to imagine human life without electrical engineering and without electrical engineers. Almost any technology that distinguishes our time has the imprint of electrical and computer engineering.

Electrical engineering has indeed advanced human prosperity through research, development and application of innovative ideas. We also seek to generate new knowledge by conducting research and disseminating results. Our mission is to serve the needs of the world through broad expertise. I am sure that participants of this conference will be benefitted and will be able to keep them abreast with the development in the field of electrical engineering.

International Conference of this magnitude required a lot of efforts, dedication and team work. I would like to express my appreciation to the joint efforts of the co-organizers, Engr. Prof. Dr. Sarosh Hashmat Lodi, Vice-Chancellor, NEDUET, Engr. Sohail Bashir, Vice-Chairman, IEP Karachi Centre and Chief Organizer, 2nd IEEC-2017, for their day & night efforts to make this event happen. I am also grateful to Keynote Speakers, Presenters, ALL Collaborating partners, Engr. Saad Ahmed Qazi, Dean Electrical Engineering Department, NEDUET, Engr. Muhammad Ali Memon, Chairman, Electrical Engineering Department, NEDUET, Engr. Dr. Riazuddin, Conference Chair, and my office staff to make this event a great success.

Engr. Ayaz Mirza, FIE (Pak)
Secretary
The Institution of Engineers Pakistan
Karachi Centre

2nd INTERNATIONAL ELECTRICAL ENGINEERING CONFERENCE (IEEC-2017)

ORGANIZING COMMITTEE

Engr. Sohail Bashir	Chief Organizer (IEEC-2017)
Engr. M. Idris Khan	Vice Chairman (Elect.), IEP Karachi
Engr. Ayaz Mirza	Secretary, IEP Karachi Centre.
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Engr. Dr. Muhammad Mohsin Aman	Conference Co-Chair, Electrical Dept., NEDUET
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Engr. Muhammad Hammad Uddin	Program Joint Secretary, Electrical Dept., NEDUET

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Engr. Shariq Shaikh	Engr. Hiba Kamal Zuberi
Engr. Iqbal Azeem	Engr. Hammad Saleem
Engr. Waseem Sangi	

From Bahria University

Prof. Dr. Haroon Rasheed	Prof. Dr. Najam -ul- Islam
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From BUIITEMS

Engr. Abbas Rizvi	Dr. Mamraiz Kasi
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From Hamdard University

Dr. Aqeel-ur Rehman	Dr. Tariq Javid
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From Indus University

Engr. Dr. Ahmed Mudassar	Engr. Rizwan Mateen
Engr. Kafil Ahmed	Engr. Sajid Ahmed
Engr. Dr. Munsif Jatoi	Engr. Shahzaib Sami

From Pakistan Navy Engineering College - NUST

Engr. Dr. Arshad Aziz	Engr. Dr. Syed Sajjad Haider Zaidi
Engr. Dr. Sajid Saleem	

From Sir Syed UET

Engr. Iqbal Qureshi	Engr. Prof. Dr. Talat Altaf
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From Usman Institute of Technology

Engr. Atif Fareed	Engr. Haris Zikrul Rehman
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MANAGEMENT COMMITTEE

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Engr. Abdul Raouf	Vice President - (Electrical& Allied) - IEP
Engr. Farhat Adil	Vice-President (Civil & Allied), IEP
Engr. Dr. Muzafar Mahmood	Vice President (Mechanical & Allied) IEP
Engr.Capt. (Retd) Sarfraz Inyatullah	Vice President - (Marine & Allied) – IEP
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Engr. Prof. Dr. M. Ashraf Shaikh	Chairman - IEP Lahore Centre
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Engr. Mirza Masood Ahmed	Chairman - IEP Quetta Centre
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Engr. Akhtar Ali Choudhry	Chairman Gujranwala Centre
Engr. Muhammad Ashraf	Director General - IEP – HQ
Engr. Gulzar A. Memon	Member Central Council, IEP-KC
Engr. Tafseer Ahmed Khan	Member Local Council, IEP-KC
Engr. Abdul Sattar Khatri	Member Central Council, IEP-KC
Engr. Abdul Aziz Bhutto	Member Central Council, IEP-KC
Engr. Idris Mala	Member Central Council, IEP-KC
Engr. Aftab Ahmed	Member Central Council, IEP-KC
Engr. Muhammad Anwar Ali	Member Central Council, IEP-KC
Engr. Sadia Muniza Faraz	Member Central Council, IEP-KC

TECHNICAL ADVISOR

Engr. Prof. Dr. S.F.A. Rafeeqi	Chairman, IEP, Karachi Centre
Engr. Prof. Dr. Sarosh Hashmat Lodi	Vice-Chancellor, NEDUET, Karachi
Engr. Ahmed Farooq Bazai	Vice-Chancellor, BUIITEMS, Quetta
Vice Admiral (Rtd.) Khawaja Ghazanfar Hussain HI(M)	DG, Bahria University, Karachi Campus
Rear Admiral Engr. Dr. Nassar Ikram SI (M)	Commandant, Pakistan Navy Engineering College, NUST
Engr. Prof. Dr. Saad A. Qazi	Dean, Faculty of Civil & Arch., NEDUET
Engr. Prof. Dr. Vali Uddin	Dean FEST, Hamdard University
Engr. Prof. Dr. Shoaib Zaidi	Dean, Usman Institute of Technology
Engr. Prof. Dr. Engr. Syed Hyder Abbas Musavi	Dean FEST, Indus University, Karachi
Engr. Commodore (R) Syed Sarfraz Ali	Registrar, Sir Syed UET, Karachi
Engr. Dr. Muhammad Ali Memon	Chairman, Deptt of Elect. Engg., NEDUET
Engr. Prof. Dr. Mir Shabbar Ali	Chairman, Deptt of Urban Engg., NEDUET



The Institution of Engineers Pakistan

AIMS AND OBJECTIVES

The main goal of the Institution of Engineers, Pakistan is to Build Better World as appearing in its logo.

The aims and objectives of the Institution are:

- a. To Promote and advance the science, practice, and business of engineering in all its branches throughout Pakistan.
- b. To Promote efficiency in the engineering practice and profession.
- c. To Regulate the professional activities and assist in maintaining high standard in the general conduct of its members.
- d. To Lay down professional code of ethics and to make it mandatory for its members in their professional conduct.
- e. To Help in the acquisition and exchange of technical knowledge.
- f. To Promote the professional interest and social welfare of its members.
- g. To Encourage original research in engineering and conservation and economic utilization of the country's materials resources.
- h. To Foster coordination with similar institutions in other countries and Engineering Universities, Institutions and Colleges in Pakistan and in other countries for mutual benefits in furthering the objects of Institution.
- i) To diffuse among its members information on all matters affecting engineering and to encourage, assist and extend knowledge and information connected therewith by establishment and promotion of lectures, discussions or correspondence, by the holding of conferences, by the publication of papers, periodicals and journals, proceedings, reports, books, circulars and maps or other literary undertaking, by encouraging research work or by the formation of library or libraries and collection of models, designs, drawings, and other articles of interest in connection with engineering or otherwise howsoever.
- j) To promote the study of engineering with a view to disseminating the information obtained for facilitating the scientific and economic development of engineering in Pakistan.
- k) To establish, acquire, carry on, control or advise with regard to colleges or other educational establishments where students and apprentices may obtain a sound education and training in engineering on such terms as may be settled by the Institution.
- l) To encourage, regulate and elevate the technical and general knowledge of persons engaged in or about to engage in engineering or in any employment manual or otherwise in connection therewith and with a view thereto function as an Educational Institution and to provide for holding of coaching wherever possible and to test by examination or otherwise the competence of such persons and to institute and establish professor-ships, student-ships, scholarships, rewards and other benefactions and to grant certificates of competency whether under any Act of the Government of Pakistan or Local Government under the Bye-Laws of the Institution regulating the conduct and qualification of engineer or otherwise howsoever.
- m) To operate with various Government agencies and industrial and commercial enterprises connected with engineering and advising them in matters concerning the profession and practice of engineering and promotion of technical education.
- n) To encourage inventions and investigate and make known their nature and merits.
- o) To arrange and promote the adoption of equitable forms of engineering contracts and other legal documents, to encourage settlement of disputes by arbitration and to act as and nominate arbitrators and to act as and nominate arbitrators and umpires on such terms as may be expedient.
- p) To promote just and honorable dealing and to suppress mal-practice in engineering
- q) To do all such other acts and things as are incidental or conducive to the above objects or any of them.

The Institution ever since its inception has been taking concerted efforts to upgrade the knowledge and technical know-how of its member engineers by undertaking various technical activities. IEP has, on number of occasions, conducted numerous studies on various technical problems, and has submitted its recommendations to the government.



The Institution of Engineers Pakistan

LIST OF ORGANIZATIONS, INSTITUTIONS HAVING AGREEMENT OF CO-OPERATION / AFFILIATIONS WITH IEP

1. World Federation of Engineering Organizations (WFEO)
2. Federation of Engineering Institutions of Islamic Countries (FEIC)
(comprising all Engineering Institution of Islamic Countries).
3. Federation of Engineering Institutions of South and Central Asia (FEISCA),
(all Engineering Institutions of SAARC Countries are its Members.)
4. Asian Civil Engineering Coordinating Council (ACECC)
5. Common-Wealth Engineers Council (CEC)
(which works under the aegis of United Nations Organization).
6. International Federation of Automatic Control (IFAC)
7. Consortium of Affiliates of International Programme (CAIP)
8. American Association for Advancement of Sciences (AAAS), USA.
9. International Association for Bridges & Structural Engineering (IABSE), USA.
10. Russian Engineering Academy, Russia
11. American Society for Civil Engineers, USA.
12. Canadian Society for Civil Engineering, Canada.
13. Royal Aeronautical Society, U.K.
14. Institution of Structural Engineers, UK.
15. Institution of Civil Engineers, UK.
16. Institution of Electrical Engineers UK.
17. Institution of Mechanical Engineers UK.
18. China Civil Engineering Society, China
19. China Mechanical Engineering Society, China.
20. China Highways & Transportation Engineering Society, China.
21. Chinese Society of Electrical Engineers, China.
22. China Institution of Electronics, China.
23. Cyprus Professional Engineers Association, Cyprus.
24. Institution of Engineers, Bangladesh.
25. Institution of Electrical Engineers of Japan
26. Institution of Engineers Sri Lanka.
27. Nepal Engineers' Association, Nepal.
28. Institution of Engineers Malaysia.
29. Institution of Engineers Indonesia.
30. Engineering Academy of Tajikistan.
31. Engineering Academy of Uzbekistan.
32. Engineering Academy of Kazakhstan.
33. Institute of Seismology and Seismological Construction, Tajikistan.
34. Republican Association of Young Engineers and Specialist, Kazakhstan.
35. Institution of Engineers Afghanistan.
36. Council of Aeronautical Science, USA.
37. Engineering Academy of Kirgistan.
38. Institution of Engineers, Australia.
39. Union of Chambers of Engineers & Architects, Turkey.
40. Korean Society of Civil Engineers, Korea.
41. Japan Society of Civil Engineers, Japan
42. Institution of Electrical and Electronics Engineers, USA.
43. Institute of Marine Engineering, Science & Technology, UK.
44. Bahrain Society of Engineers, Bahrain.

2nd INTERNATIONAL ELECTRICAL ENGINEERING CONFERENCE (IEEC-2017)

Friday 19th & Saturday 20th May, 2017

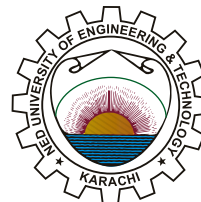
PROGRAMME

Jointly Organised by

The Institution of Engineers Pakistan
Karachi Centre



NED University of Engineering & Technology
Karachi



in collaboration with



Bahria University



Balochistan University of
Information Technology
Engineering & Management
Sciences (BUITEMS)



Hamdard University



Indus University



Pakistan Navy
Engineering College - NUST



Sir Syed University
of Engineering &
Technology



Usman Institute of Technology



IEEE Power & Energy Society
(Karachi Chapter)



The Institution of
Engineering and Technology
(Karachi Chapter)



The Institution of Electrical
& Electronics Engineers Pakistan
(Karachi Chapter)



Federation of Engineering Institutions
of South & Central Asia (FEISCA)



Federation of Engineering
Institutions of Islamic
Countries (FEIIC)

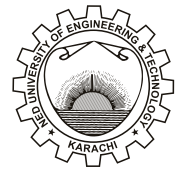


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PROGRAMME

INAUGURAL SESSION ON FRIDAY 19TH MAY 2017

15:30 Hrs.	Guests to be seated
15:35 Hrs.	Arrival of Chief Guest & Guest of Honor
15:40 Hrs.	Recitation from the Holy Quran.
15:45 Hrs.	National Anthem
15:50 Hrs.	Welcome and Conference Briefing by Engr Sohail Bashir, FIE (PAK) Chief Organizer, 2 nd IEEC-2017
15:55 Hrs.	Address by Engr. Prof. Dr. S. F. A. Rafeeqi, FIE (Pak) Chairman, IEP, Karachi Centre
16:00 Hrs.	Address by Engr. Dr. Izhar Ul Haq, FIE (Pak), President, IEP
16:05 Hrs.	Address by Engr Prof Dr. Sarosh Hashmat Lodhi Vice Chancellor, NEDUET, Karachi
16:10 Hrs.	Key Note Address by Engr. Prof. Dr. Ted Johansson, Linköping University, Sweden
16:40 Hrs.	Key Note Address by Engr. Prof. Dr. Uvais Qidwai, Qatar University, Qatar
17:15 Hrs.	Address by Engr. Mian Sultan Mahmood, FIE (Pak), Secretary General, IEP, Karachi
17:20 Hrs.	Address by Guest of Honor
17:25 Hrs.	Address by Chief Guest
17:30 Hrs.	Distribution of Mementos
17:35 Hrs.	Vote of Thanks by Engr. Ayaz Mirza, FIE (Pak), Secretary, IEP Karachi Center
17:40 Hrs.	Tea & Asar Prayer
18:00 Hrs.	Technical Session-1
19:10 Hrs.	Maghrib Prayers
19:25 Hrs.	Dinner

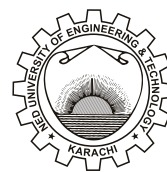


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IEEC 2017 Program Schedule

IEEC Day 1 19th May 2017

Time	Convention Centre
15:30-17:20	Inaugural session 1. Keynote by Docent, Adjunct Prof. Ted Johansson, Linköping University, Sweden 2. Keynote by Engr. Prof. Dr. Uvais Qidwai, Qatar University, Qatar
17:20-17:40	Guest of Honor & Vote of Thanks
17:40-18:00	Tea & Asar Prayers
18:00-19:10	Technical Session-I (Renewable Energy, Alternate Resources & Power System) Session Chairs: Engr. Dr. Muhammad Ali Memon (NED), Engr. Commodore (R) Syed Sarfraz Ali (SSUET), Engr. Dr. Sadia Muniza Faraz (IEP), Engr. Zafar Faridi (IET)
19:10-19:25	Maghrib Prayer
19:25	Conference Dinner

IEEC Day 2 20th May 2017

Time	Convention Centre	Dr. S. A. Hassan Hall
9:30-11:00	Technical Session-II (Signal & Image Processing, Computer Systems and Networks) Session Chairs: Engr. Dr. Riaz Uddin (NED), Engr. Prof. Dr. Haroon Rasheed (BAHRIA), Engr. Syed Anwar Ali (IEP), Engr. Dr. Ahmed Mudassir Khan (INDUS)	Technical Session-III (Power Systems and Policies) Session Chairs: Engr. Dr. Mohsin Aman (NED), Engr. Dr. Anayatullah (BUIEMS), Engr. Gulzar A. Memon (IEP)
11:00-11:20	Tea	
11:20-11:50	Keynote By Dr. Tahir Izhar University of Engineering & Technology, Lahore	
11:50-12:00	Sponsor Slot	
12:00-13:10	Technical Session-IV (Communication System and Software Applications) Session Chairs: Engr. Dr. Imran Aslam (NED), Engr. Dr. Waliuddin (HAMDARD), Engr. Irfan Shaikh (IEEEP) and Engr. Tafseer Ahmed Khan (IEP)	Technical Session-V (Power Systems and Policies) Session Chairs: Engr. Dr. Usman Ali Shah (NED), Engr. Prof. Dr. Syed Hyder Abbas Musavi (INDUS), Engr. Idris Mala (IEP)
13:10-14:00	Zohar Prayers & Lunch	
14:00-15:30	Technical Session-VI (Embedded Systems and Applications) Session Chairs: Engr. Abdurrahman Javid Shaikh (NED), Engr. Prof. Dr. Abdul Qadir (UIT), Engr. Dr. Sajid Saleem (NUST)	Technical Session-VII (Electronics Applications, Controls and Applied Computing) Session Chairs: Engr. Dr. Hashim Raza Khan (NED), Engr. Prof. Dr. Talat Ataf (SSUET), Engr. Dr. Arshad Aziz (NUST)
15:30-15:40	Tea Break	
03:40-17:30	Closing Ceremony	
17:30-18:00	Asar Prayers & Hi Tea	

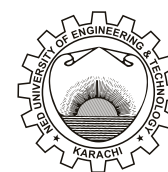


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PROGRAM SCHEDULE FOR ORAL SESSIONS

(Day 1)

Technical Session-I (Renewable Energy, Alternate Resources & Power System)

Convention Center

Session Chairs: Engr. Dr. Muhammad Ali Memon (NED), Engr. Commodore (R) Syed Sarfraz Ali (SSUET),
Engr. Dr. Sadia Muniza Faraz (IEP), Engr. Zafar Faridi (IET)

Time:	Paper ID:	Paper Details
18:00-18:20	IEEC2017-27	Anthocyanin based Photosensitizer for Natural Dye-Sensitized Solar Cells by Maheen Mazhar, Muhammad Hassan Sayyad and Sadia Muniza Faraz
18:20-18:40	IEEC2017-49	Fault detection and localization of symmetrical fault using PCA and WT by Shariq Shaikh, Adnan Ali, Abdullah Munir and Muhammad Ali Memon
18:40-19:00	IEEC2017-59	Power Sharing using Phase Shift Mechanism in Grid Interactive Photo-voltaic Power Systems Iqbal Azeem, Abdul Maalik Naeem, Umair Anwar, Shakir Jilani, Hassina Suleman Shah & Shayan Khan
19:00-19:10	Certificate Distribution	

(Day 2)

Technical Session-II (Signal & Image Processing, Computer Systems and Networks)

Convention Center

Session Chairs: Engr. Dr. Riaz Uddin (NED), Engr. Prof. Dr. Haroon Rasheed (BAHRIA), Engr. Syed Anwar Ali (IEP),
Engr. Dr. Ahmed Mudassir Khan (INDUS)

Time:	Paper ID:	Paper Details
9:30-09:50	IEEC2017-13	Cross-sectional Analysis of Brain Magnetic Resonance Images for Abnormal cell growth by using Histogram Equalization by Mashal Tariq and Shehla Andleeb
09:50-10:10	IEEC2017-17	Estimating Reconstruction Error due to Jitter of Gaussian Markov Processes by Mudassir Javed and Dawood Shah
10:10-10:30	IEEC2017-37	Security in Vehicular Ad hoc Networks by Yasir Iqbal, Yusra Kaleem
10:30-10:50	IEEC2017-67	Automatic Detection of Tuberculosis in Chest Radiographs using Machine by Learning Taqia Ali, Dr. Abdul Samad, Dr. M. Imran Quereshi
10:50-11:00	Certificate Distribution	

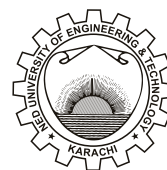


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Technical Session-III (Power Systems and Policies)		
Dr. S. A. Hassan Hall		
Session Chairs: Engr. Dr. Mohsin Aman (NED), Engr. Dr. Anayatullah (BUIITEMS), Engr. Gulzar A. Memon (IEP)		
Time:	Paper ID:	Paper Details
9:30-09:50	IEEC2017-25	INDIGINEOUS VERTICAL WIND TURBINE by Umer Iqbal, Asif Gulraiz
09:50-10:10	IEEC2017-55	Evaluation of Electromagnetig Environment Impact of Different Transmission Line Configuration Used In Pakistan by Adnan Ali, Shariq Shaikh, Abdullah Munir, Shahzaib Naveed, Zoha Furqan and Ramzan Murree
10:10-10:30	IEEC2017-56	Comparative analysis of ST1A and ST2A excitation system models for voltage stability of alternator by Shariq Shaikh, S.Taha Ahmed, Shiraz Khan, M. Maaz Naseer and M.A. Rehman
10:30-10:50	IEEC2017-61	Hardware Implementation Of Non Directional Over Current Relay on Arduino by Arsalan Zahid, Tahir Nisar Gondal, Naveed Ali, Muhammad Umair,
10:50-11:00		Certificate Distribution
Convention Center		
11:20-11:50	Keynote Talk	Dr. Tahir Izhar University of Engineering & Technology, Lahore
Technical Session-IV (Communication Systems and Software Applications)		
Session Chairs: Engr. Dr. Imran Aslam (NED), Engr. Dr. Waliuddin (HAMDARD), Engr. Irfan Shaikh (IEEEP) and Engr. Tafseer Ahmed Khan (IEP)		
Time:	Paper ID:	Paper Details
12:00-12:20	IEEC2017-33	Realization of Spectrum Sensing in Cognitive Radio by Yasir Iqbal, Yusra Kaleem, Ayesha Asad and Muhammad Waseem
12:20-12:40	IEEC2017-42	Sniffing, Decoding and Decryptionof GSM signals using Open Source Software and Low Cost Hardware by Muhammad Talha Choudary, Arish Yaseen, Muhammad A Javaid, Abeer R Khan, Bilal A Khawaja, Sajid Saleem and Muhammed Mustaqim
12:40-13:00	IEEC2017-40	Supply Chain Management System: A Web-Application for Distributors by Zuhaib Ali, Muhammad Shoaib and Riaz Uddin
13:00-13:10		Certificate Distribution

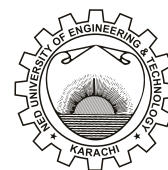


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Dr. S. A. Hassan Hall					
Technical Session-V (Power Systems and Policies)					
Session Chairs: Engr. Dr. Usman Ali Shah (NED), Engr. Prof. Dr. Syed Hyder Abbas Musavi (INDUS), Engr. Idris Mala (IEP)					
Time:	Paper ID:	Paper Details			
12:00-12:20	IEEC2017-23	Comparison of Different Economical Dispatch Algorithms for a Hybrid Power System by Syed Muhammad Faraz Ali, Sheikh Usman Uddin, Umer Hayat, Dr. Sajjad Haider Zaidi			
12:20-12:40	IEEC2017-32	Energy Conservation Through Load Balancing by Muhammad Osama bin Shakeel, Muhammad Faheem Ali, Syed Ali Jaffar Cdr. Sajjad Haider Zaidi			
12:40-13:00	IEEC2017-47	Meta- Heuristic based Optimization Algorithms: A Comparative Study of Genetic Algorithm and Particle Swarm Optimization by Mohammad Affan			
13:00-13:10	Certificate Distribution				
Technical Session-VI (Embedded Systems and Applications)					
Dr. S. A. Hassan Hall					
Session Chairs: Engr. Abdurrahman Javid Shaikh (NED), Engr. Prof. Dr. Abdul Qadir (UIT), Engr. Dr. Sajid Saleem (NUST)					
Time:	Paper ID:	Paper Details			
14:00-14:20	IEEC2017-38	Edutainment System For Autistic Children by Asma Yousuf, Rida Irfan, Iqra Siddiqui, Syed Saad-ul-Hasan and Hashim Raza Khan			
14:20-14:40	IEEC2017-63	Textile sensors for monitoring body movement by Surjeet Kumar, Muhammad Junaid Sultan, Dr. Anayat Ullah1, Dr. Zameer Shah			
14:40-15:00	IEEC2017-64	Stress Optimization for a MEMS Multilayer Fixed-Fixed Beam by Dr. Anayat Ullah & Luqman Saranzai			
15:00-15:20	IEEC2017-57	Wireless Building Automation Using ESP8266: An Energy Efficient Approach by Afrah Ziauddin, Sabah Fatimah, Samra Ashraf, Iqbal Azeem and Riaz Uddin			
15:20-15:30	Certificate Distribution				

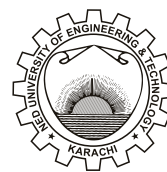


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Technical Session VII (Electronics Applications, Controls and Applied Computing)		
Convention Center		
Session Chairs: Engr. Dr. Hashim Raza Khan (NED), Engr. Prof. Dr. Talat Ataf (SSUET), Engr. Dr. Arshad Aziz (NUST)		
Time:	Paper ID:	Paper Details
14:00-14:20	IEEC2017-43	Actively Biased Differential Drive Rectifier circuit with Backscattering Communication by Asma Mahar, Ayesha Hassan, Naveed, Arham Iqbal, Madiha Azhar, Yasir, Arsalan Jawed
14:20-14:40	IEEC2017-65	Effect of Hidden Layers in Artificial Neural Networks for Snake Robot Locomotion Control by Janzaib Masood, Zulkafil Abbas, Abdul Samad, Anayat Ullah
14:40-15:00	IEEC2017-46	Efficiency Improvement of a Wireless Power Transfer System by Ayesha Hassan, Asma Mahar, Naveed, Sidra Saeed Gillani, Yasir Siddiqui and Arsalan Jawed
15:00-15:20	IEEC2017-66	PLC Based Automated Bottle Filling Plant by Jahanzeb Khan, Anayat Ullah, Zulkafil Abbas, Hamid Karim
15:20-15:30	Certificate Distribution	

PROGRAM SCHEDULE FOR POSTER SESSION			
Technical Session-VIII (Poster Presentations)			
Time:	Seminar Room 2	Paper ID:	Paper Details
12:00- 15:20	Session Chairs: Engr. Muhammad Javed, Engr. Muhammad Ali Baig, Engr. Shoaib Siddique, Engr. Uzma Perveen, Engr. Abdullah Munir, Engr. Fezan Rafique, Engr. Iqbal Azeem, Engr. Syed Muhammad Zahid, Engr. Ayesha Khan, Engr. Muhammad Farooq Siddiqui, Engr. Hiba Kamal Zuberi, Engr. Hammad Saleem, Engr. Muhammad Furqan, Engr. Uzair Ahmed Khan, Engr. Arshad Khan, Engr. Nimra Riaz Malik, Engr. Ayesha Saeed	IEEC2017-26	Power Line Control and Monitoring Using FPGA by Usama Bin Rehan, Asif Gulraiz, Khyzer Amin, Shayaan Amin, Musa Raza
		IEEC2017-28	HOME AREA NETWORKS: A cost effective design and its implementation by Sana Fatima, Iqra Amjad, Maliha Yasir & Dr. Sajjad Haider Zaidi
		IEEC2017-44	Temperature Sensors and Interface For Ultra-Low Power Microsystems by Naveed , Ayesha Hassan , Asma Mahar, Yasir, Muhammed Mustaqim, Arsalan Jawed
		IEEC2017-52	Detection and Estimation of Slip Effect on the Parameters of DC Motor Mounted on Commuter Rail using Kalman Filter: A Feasibility by Shahzor Memon and Riaz Uddin
	Seminar Room 3	IEEC2017-29	Thermal and Electrical failure analysis of lithium-ion battery after crash by Muhammad Sheikh , Ahmed Elmarakbi and Sheikh Rehman
	Session Chairs: Engr. Arjumand Samad, Engr. Shahnaz Tabassum, Engr. Muhammad Umer Sajid, Engr. Samiya Zafar, Engr. Muhammad Omar, Engr. Anila Abbas, Engr. Shariq Shaikh, Engr. Adnan Ali, Engr. Talha Javed Soleja, Engr. Rashid Hussain, Engr. Nabeel Fayyaz, Engr. Najia Naveed, Engr. Saddam Hussain, Engr. Muhammad Waseem Sangi, Engr. Muhammad, Irfan Shaikh, Engr. Noor-ul-Ain	IEEC2017-15	Analysis of The Awareness of Present Day Undergraduate Electrical Engineering Students About Contemporary Technologies An Educational Survey About FACTS Devices by Samiya Zafar, Yusra Rauf, Fizzah, Hira Haider, and Sana
		IEEC2017-20	Clustering Algorithms of Wireless Sensor Networks: A Survey by Muhammad Noman Riaz
		IEEC2017-30	Internet Traffic Management with Multiprotocol Label Switching (MPLS) by Muhammad Saleem, Aqeel-ur-Rehman, Muzaffar Rao, Irfan Usmani and Fawadul haq
		IEEC2017-34	Transformer Health Monitoring by Syed Shahzeb Raza Bilgrami, Muhammad Awais Aitmad, Ameer Hamza Muhammad Farhan Siddiqui, Dr. Sajjad Haider Zaidi, Muhammad Salman Khan , Muneeb Islam
15:20-15:30	Certificate Distribution		

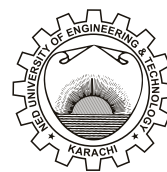


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PROGRAMME

CLOSING SESSION ON SATURDAY 20TH MAY, 2017

15:40 Hrs.	Guest to be seated
15:50 Hrs.	Arrival of Chief Guest & Guests of Honor
16:00 Hrs.	Recitation from the Holy Quran
16:10 Hrs.	Address by Engr. Sohail Bashir, FIE (PAK) Chief Organizer, 2 nd IEEC-2017
16:20 Hrs.	Address by Engr. Prof. Dr. S.F.A. Rafeeqi, FIE (PAK) Chairman, IEP Karachi Center
16:30 Hrs.	Address by Engr. Prof. Dr. Muhammad Ali Memon Chairman Department of Electrical Engineering, NEDUET
16:40 Hrs.	Address by Engr. Prof. Dr. Sarosh Hashmat Lodi, Vice-Chancellor NED University of Engineering & Technology, Karachi
16:50 Hrs.	Address by Guest of Honor
17:00 Hrs.	Address by Chief Guest
17:10 Hrs.	Concluding Remarks & Conference Recommendations by Engr. Dr. Riaz Uddin Conference Chair, IEEC-2017, Department of Electrical Engineering, NEDUET
17:20 Hrs.	Presentation of Conference Mementos
17:25 Hrs.	Vote of Thanks by Engr. M. Idris Khan, MIE (PAK) Vice-Chairman (Electrical), IEP Karachi Center
17:30 Hrs.	Asr Prayers
17:45 Hrs..	Refreshments

Technical Session-I**(Renewable Energy, Alternate Resources & Power System)****Session Chairs: Engr. Dr. Muhammad Ali Memon (NED),****Engr. Commodore (R) Syed Sarfraz Ali (SSUET),****Engr. Dr. Sadia Muniza Faraz (IEP), Engr. Zafar Faridi (IET)****IEEC2017-27****Anthocyanin based Photosensitizer for Natural Dye-Sensitized Solar Cells**Maheen Mazhar^{1*}, Muhammad Hassan Sayyad² and Sadia Muniza Faraz I¹Department of Electronic Engineering, NED University of Engineering and Technology,
Karachi, 75270, Pakistan² Faculty of Engineering Sciences, Ghulam Ishaq Khan Institute of Engineering Sciences and
Technology, Topi, District Swabi, Khyber Pakhtunkhwa 23640, Pakistan* Corresponding author : maheen@neduet.edu.pk

Abstract: This work is focused in utilization of low cost and ecofriendly dyes for development of dye-sensitized solar cells. Pomegranate extract is used as anthocyanin based natural pigments. The efficiency, open circuit voltage, short circuit current and fill factor is determined and compared with standard cell using N719 dye. Pomegranate appeared as promising candidate for the dye giving an efficiency of 0.12%, VOC of 0.5V, JSC of 0.33mA/cm² and FF of 68.7%

Keywords: Dye-Sensitized Solar Cells, Natural Dyes, Anthocyanin, eco-friendly, TiO₂**IEEC2017-49****Fault detection and localization of symmetrical fault using PCA and WT**

Shariq Shaikh*, Adnan Ali, Abdullah Munir and Muhammad Ali Memon

Department of Electrical Engineering, NED University of Engineering and Technology,
Karachi, 75290, Pakistan (shariq.shaikh@hotmail.com)* Corresponding author

Abstract: Power system is one of the most complicated interconnected systems from the generation to the distribution ends due to its multi-constraint operation and control. Maintaining the integrity of power system is imperative for the effective operation of interconnected power systems. Power system is always risk to get subjected to major and minor perturbations due to unavoidable situations and their impact on the system depends significantly on the nature of disturbance and its localization. Although, conventional protective devices interrupt the faulty section of the power system but are not efficient in detecting the exact location of the fault, especially in the case of transmission lines. Consequently, it requires a long time in manual identification of the fault location. Smart protection schemes based on efficient algorithms for the identification of the faulted bus and its time localization can curtail the supply storage time of the faulted section effectively. In this paper, one of the severe disturbance i.e. three phase bolted fault is applied on different buses of standard IEEE 39 bus system to acquire the bus voltage data. "Principal Component Analysis" (PCA) & "Wavelet Transform" (WT) techniques are applied on the stored data for the detection of faulted bus and to highlight the instant of fault occurrence respectively. The results of the analysis show that these techniques serve as useful tools in detecting the abnormalities in the operation of power system and to morph the existing protection schemes into an intelligent and smart protection scheme

Keywords: Principal Component Analysis, Wavelet Transform, Bolted bus fault.

IEEC2017-59

Power Sharing using Phase Shift Mechanism in Grid Interactive Photo-voltaic Power Systems

Iqbal Azeem*, Abdul Maalik Naeem, Umair Anwar, Shakir Jilani,
Hassina Suleman Shah & Shayan Khan

Department of Electrical Engineering, NED University of Engineering and Technology,
Karachi, 75290, Pakistan. iqbal.azeem@neduet.edu.pk *Corresponding author

Abstract: Finite amount of fossil fuels meant more reliance on energy produced by renewable sources. Solar energy is considered as a game changer all over the world due to its cleanliness and easiness to fetch; different methods are employed globally to increase solar consumption in way that would significantly reduce utility consumption without - of course - compromising on the continuous power supply to the grid. Synchronizing solar system with the grid is a concept that requires synchronization of AC bulk energy source with the limited DC energy source. Complete synchrony of both sources will ensure continuous power supply to the load with maximum power provided by solar energy, and only deficit power being contributed by utility; surplus power will also find its way to the grid ensuring no power is wasted. Phase angle between grid voltage and inverter voltage is changed which changes power share of both the sources accordingly. MPPT mechanism is incorporated to ensure maximum efficient utilization of solar source. Simple design with low-cost hardware paves way for its easier implementation without much hiccups.

Keywords: GTI, Inverter, P&O, MPPT, PV, DC, AC, SPWM, MPP, PWM, MOSFET.

Technical Session-II

(Signal & Image Processing, Computer Systems and Networks)

Session Chairs: Engr. Dr. Riaz Uddin (NED),

Engr. Prof. Dr. Haroon Rasheed (BAHRIA), Engr. Syed Anwar Ali (IEP),

Engr. Dr. Ahmed Mudassir Khan (INDUS)

IEEC2017-13

Cross-sectional Analysis of Brain Magnetic Resonance Images for Abnormal cell growth by using Histogram Equalization

Mashal Tariq^{1*} and Shehla Andleeb²

^{1,2} Department of Electrical Engineering, Usman Institute of Technology, Karachi,
Pakistan (mtariq@uit.edu) * Corresponding author

Abstract: The purpose of this work is to highlight importance of digital image processing in bio-medical engineering. Imaging modalities provides vital aid to medical professional in disease prognosis. Brain tumor is a fatal and life threatening disease. Experts suggest Magnetic Resonance Imaging for investigation of brain disease. Computer aided diagnosis has developed rapidly for the last two decades. Image Enhancement is first step of digital image processing after image acquisition. This paper deals with application of histogram equalization image enhancement techniques to normal and brain tumor T1-weighted and T2-weighted magnetic resonance images using MATLAB platform. Solid cum cystic type of brain tumor is selected for this study. Images histogram of normal and tumor are interpreted and compared. Our work provides basic platform for tumor detection and segmentation. Statistical analysis is also presented.

Keywords: Brain, images, MRI, tumor, computers.

IEEC2017-17

Estimating Reconstruction Error due to Jitter of Gaussian Markov Processes

Mudassir Javed* and Dawood Shah

Department of Electrical Engineering College of Electrical and Mechanical Engineering,
National University of Sciences and Technology, Islamabad, Pakistan.Email: mudassir.javed16@ee.ceme.edu.pk , dawoodshahee@gmail.com.

*Corresponding Author

Abstract: This paper presents estimation of reconstruction error due to jitter of Gaussian Markov Processes. Two samples are considered for the analysis in two different situations. In one situation, the first sample does not have jitter while the other one is effected by jitter. In the second situation, both the samples are effected by jitter. The probability density functions of the jitter are given by Uniform Distribution and Erlang Distribution. Statistical averaging is applied to conditional expectation of random variable of jitter. From that, conditional variance is obtained which is defined as reconstruction error function and by knowing that, the reconstruction error of a Gaussian Markov Process is determined.

Keywords: Jitter, Uniform Distribution, Erlang Distribution, Gaussian Markov Process, Probability Density Function.

IEEC2017-37

Security in Vehicular Ad hoc NetworksYasir Iqbal^{1*}, Yusra Kaleem²

¹ Department of Telecommunication Engineering,
Sir Syed University of Engineering and Technology, Karachi, 75300, Pakistan
(yasiriqbal.engr@gmail.com) * Corresponding author

² Department of Telecommunication Engineering,
Sir Syed University of Engineering and Technology, Karachi, 75300, Pakistan
(yusra.kaleem13@gmail.com)

Abstract: Vehicular Ad hoc Networks (VANETs) are the hopeful method for drivers and travelers to give insurance. It is used to provide communication between vehicle to vehicle (onboard unit) or vehicle to infrastructure (roadside units). Wireless communication, security, and privacy are very important parameters to avoid threat in a network. It assumes an imperative part in clever transport framework which provide a self-aware mechanism that has major effect in enhancement of traffic services and in decreasing ratio of road accidents. But as the other networks, VANET has also challenges about security especially authentication, privacy and attacks against resources. This paper presents a survey that categorizes security issues, solutions, challenges and attack types according to different VANET applications

Keywords: Vehicular Ad hoc Network, VANET, Attacks, Security threats.

IEEC2017-67

Automatic Detection of Tuberculosis in Chest Radiographs using Machine LearningTaqia Ali, Dr. Abdul Samad¹, Dr. M. Imran Quereshi¹ abdul.samad1@buitms.edu.pk

Abstract: Tuberculosis is a major health risk in several parts of the world. Tuberculosis is contagious disease that is caused by bacteria called Mycobacterium tuberculosis. To prevent the spread of the tuberculosis it is mandatory to diagnose the disease timely. Chest radiographs is the most common, inexpensive diagnosis method particularly in resource constraint areas. Lung region is the most affected part of Tuberculosis. Image gradients, thresholding, morphological operations are used for segmenting lung field. Texture and statistical features are extracted and feature selection methods are also applied to find best features. All the features are concatenated to one feature vector and is fed to five different classifiers namely support vector machines, logistic regression, random forest, naive bayes, and multilayer perceptron using 10 fold cross validation .Support vector machines outperform other classifiers with accuracy of 86.95% and results also shows that proposed method has outperformed the existing state of the art methods on Montgomery dataset.

Keywords: Keywords-Chest radiographs, Cross validation, Mycobacterium tuberculosis, Montgomery dataset, Support vector machine, Thresholding

TECHNICAL SESSION –III**Power Systems and Policies****Session Chairs: Engr. Dr. Mohsin Aman (NED),****Engr. Dr. Anayatullah (BUIEMS), Engr. Gulzar A. Memon (IEP)**

IEEC2017-25

Indigineous Vertical Wind TurbineUmer Iqbal¹, Asif Gulraiz^{2*}, Hassan Bin Muslim³, Taha Khan⁴¹ Student, Department of Electrical Engineering,Usman Institute of Technology, Karachi, Pakistan (umer2550@gmail.com)² Department of Electrical Engineering , DHA Suffa University, Karachi, Pakistan (asifgulraiz2002@hotmail.com) * Corresponding author³ Student, Department of Electrical Engineering,Usman Institute of Technology, Karachi, Pakistan (hbm0505@gmail.com)⁴ Student, Department of Electrical Engineering, Usman Institute of Technology, Karachi, Pakistan (thetahhakhan@gmail.com)

Abstract: An indigenous vertical wind turbine is designed to overcome the need of electricity especially in remote areas since it can be installed easily anywhere. Conventional wind turbines are huge and expensive to install at homes or in the areas where there is no electricity especially in rural areas. This wind turbine is designed with an idea of easy installation and it can be de-assemble by a common man. Alternate source of energy will be capable of producing substantial annual power as well as it can give financial savings also. Portable wind turbine can be installed in areas where grid connectivity is not present i.e. rural areas, it works great in remote locations where short fall of electricity is high or no electricity is present. Wind turbine is an "eco-friendly" source of producing energy since it doesn't emit toxic gases which is harmful for the environment.

Keywords: Vertical wind turbine, Energy, renewables, distributed generation

IEEC2017-55

Evaluation Of Electromagnetic Environmental Impact Of Different Transmission Line Configurations Used In Pakistan

Adnan Ali^{1*}, Shariq shaikh¹, Abdullah Munir¹, Shahzaib Naveed¹,
Zoha Furqan¹, Ramzan Murree²

¹ Electrical Engineering Department, NED university of Engineering & Technology
Karachi, Pakistan Karachi, 75290, Pakistan

² National Electric Power Regulatory Authority, NEPRA, Pakistan

Corresponding Author: *(adnanali@neduet.edu.pk)

Abstract: Electric Power transmission lines are the bulk power carriers which are characterized by high voltages and currents. These parameters create an electromagnetic environment in the proximity of transmission lines. The combined effects of which can be sensed in the near vicinity and even at ground level. The electric and magnetic field values are needed as part of Environmental Impact Assessment (EIA) report for the transmission lines and in selecting the ROW (Right of Way) for the transmission line projects. This paper presents the analytical results of the calculation of magnetic field and electric field generated by transmission lines and different geometrical tower configurations of WAPDA (Water and Power Development Authority) Pakistan. Calculation of these values is emphasized from environmental and health point of view. Some of the leading studies on this issue and their conclusions are discussed. The limiting values as applicable to right-of-way of transmission lines are discussed according to the guidelines of International Commission on Non-Ionizing Radiation Protection (ICNIRP).

Keywords: Electromagnetic Field, Health Effects, Transmission line, Magnetic Field Reduction

IEEC2017-56

Comparative analysis of ST1A and ST2A excitation system models for voltage stability of alternator

Shariq Shaikh¹, S.Taha Ahmed^{1*}, Shiraz Khan¹, M. Maaz Naseer¹ and M.A. Rehman²

¹ Department of Electrical Engineering,

NED University of Engineering and Technology, Karachi, 75290, Pakistan

² SIEMENS, Pakistan (taha-ahmed_93@hotmail.com) * Corresponding author

Abstract: Excitation system governs the response of alternator regarding reactive power (Q) supply from it. Different excitation models have been developed in past years to predict the generator response for stability of power system operation. Static excitation systems are most widely used Q-control system due to merits over other systems. In this paper, we have done a comparative study to investigate the response of ST1A and ST2A excitation system models under different operating conditions. ST1A models the potential-source controlled-rectifier excitation system while ST2A compound-source rectifier excitation systems. Two areas four machine power system configuration is used for analysis. Simulation work is carried out on Simulink (MATLAB) and the responses of two exciters under different circumstances have been discussed. The key focus in this comparative study is on the response of exciter voltage and corresponding generator terminal voltage. The principle result of this simulation is that under bolted fault conditions in power system, ST2A performance is considerably better from the perspective of terminal voltage stability and rotor oscillations as compare to ST1A.

Keywords: Reactive power control, ST1A & ST2A excitation systems, Voltage stability.

IEEC2017-61

Hardware Implementation Of Non Directional Over Current Relay on Arduino®

Arsalan Zahid¹, Tahir Nisar Gondal¹, Naveed Ali¹,
Muhammad Umair¹, Muhammad Mohsin Aman^{1*}

¹ Department of Electrical Engineering, NED University of Engineering and
Technology, Karachi, 75290, Pakistan
(mohsinaman@neduet.edu.pk)* Corresponding author

Abstract: This paper presents the design and hardware implementation of non-directional Over-Current Relay (OCR) on Arduino®. The Standard Inverse (SI), Very Inverse (VI) and Extremely Inverse (EI) characteristic of OCR have also been incorporated in the designed relay. The performance of the designed relay was tested on different load scenarios and it was observed that the relay was well observing the desired inverse time characteristics including SI, VI and EI curves.

Keywords: Over-Current Relay (OCR), protective relays, IEC 60255

TECHNICAL SESSION –IV**(Communication Systems and Software Applications)**

Session Chairs: Engr. Dr. Imran Aslam (NED), Engr. Dr. Waliuddin (HAMDARD),
Engr. Irfan Shaikh (IEEEP) and Engr. Tafseer Ahmed Khan (IEP)

IEEC2017-33

Realization of Spectrum Sensing in Cognitive Radio

Yasir Iqbal^{1*}, Yusra Kaleem², Ayesha Asad³ and Muhammad Waseem⁴

¹ Department of Telecommunication Engineering,

Sir Syed University of Engineering and Technology, Karachi, 75300, Pakistan

(yasiriqbal.engr@gmail.com) * Corresponding author

^{2,3,3} Department of Telecommunication Engineering, Sir Syed University of Engineering and
Technology, Karachi, 75300, Pakistan

(yusra.kaleem13@gmail.com) (electro-ayesha@hotmail.com) (engrmwaseem@gmail.com)

Abstract—The radio spectrum is becoming increasingly rare. The demand and needs of new wireless applications are escalating dramatically; likewise, the bands less than 3 GHz are extremely sparse. Radio spectrum has become bottleneck that could obstruct the new wireless communication system. According to the survey conducted by Federal Communication Commission (FCC), a huge number of bands are underutilized, ranging from 15 to 85%, while few bands are overloaded. Therefore, the concept of Cognitive Radio was developed to overcome the problem of low spectrum utilization and to solve the spectrum congestion problem effectively. The implementation of Cognitive Radio assures the full utilization of spectrum for secondary user, when the primary (licensed) user is not available. Spectrum sensing is a function of Cognitive Radio, which primarily is responsible to sense and analyze its spectrum environment, then it detects unused spectrum in licensed band. This paper demonstrates Energy Detection technique of spectrum sensing which requires no previous knowledge of received signal. Energy Detection algorithm is implemented on Raspberry pi through MATLAB 2014 to analyze the cognitive radio network..

Keywords: Cognitive Radio, Energy Detection, PSD, Spectrum Sensing, Channel Utilization, Raspberry pi

IEEC2017-42**Sniffing, Decoding and Decryption of GSM signals using Open Source Software and Low Cost Hardware**

Muhammad Talha Choudary^{1*}, Arish Yaseen¹, Muhammad A Javaid¹,
Abeer R Khan¹, Bilal A Khawaja¹, Sajid Saleem¹, Muhammed Mustaqim¹

¹ Department of Electronics and Power Engineering, PNEC-NUST,
Karachi, Pakistan

(* Corresponding author) (talha.choudhry-ee@pniec.nust.edu.pk*,
ssaleem@pniec.nust.edu.pk, mmustaqim@pniec.nust.edu.pk)

Abstract: We report- a software defined platform is used to sniff, decode and decrypt GSM signals. A RTL-SDR [8] along with GR-GSM and Wire shark is used to decrypt GSM signals. This approach eliminates the need of GPUs and also provides us decoded GSM signals in real time. In addition, this approach enabling applications in telecommunication to monitor GSM signals in real time also useful for military purposes. This approach is discussed on the basis of experimental results.

Keywords: GSM signal, TMSI, KC, GR-GSM, RTL-SDR (Software Defined Radios), A5/1 A5/3 encryption

IEEC2017-40**Supply Chain Management System: A Web-Application for Distributors**

Zuhaib Ali¹, Muhammad Shoaib² and Riaz Uddin^{3*}

^{1,2} Department of Computer Science, Newports Institute of Communication and Economics,
Karachi, Pakistan zohaib1111@gmail.com, mohammadshoaibwardak@gmail.com

³ Department of Electrical Engineering
NED University of Engineering and Technology, Karachi-75270, Pakistan
riazuddin@neduet.edu.pk *Corresponding author

Abstract: Distributor refers to a company that is supposed to purchase merchandise from the manufacturer in bulk and sale it to retailers. The distributors are usually required to perform a long-complicated process which includes different activities such as taking orders, delivering goods, payment recovery etc., along with maintaining proper record for reporting, auditing and other future purposes. In this regard, the distributors are used to fill information in printed sheets manually. This practice makes them burdensome and increases the possibility of errors due to large amount of work and complexity in terms of item details. Furthermore, this causes problems in reporting, business analysis, segregating of the customers by loyalty, etc. In this regard, this paper proposes a web-application named as Supply Chain Management System (SCMS), which takes care of the above mentioned issues very conveniently and provides an easy work environment. In order to do so, entire process of good's distribution is well-understood from the stakeholders and then a prototype of SCMS is developed.

Keywords: Supply Chain Management System, Inventory Control, Supply and Demand Planning, Recovery Management System.

TECHNICAL SESSION –V

Power Systems and Policies

Session Chairs: Engr. Dr. Usman Ali Shah (NED),

Engr. Prof. Dr. Syed Hyder Abbas Musavi (INDUS), Engr. Idris Mala (IEP)

IEEC2017-23

Comparison of Different Economical Dispatch Algorithms for a Hybrid Power System

Syed Muhammad Faraz Ali, Sheikh Usman Uddin, Umer Hayat, Dr. Sajjad Haider Zaidi

Pakistan Navy Engineering College,

National University of Sciences and Technology, Karachi, Pakistan

Email: FarazEE961@pnec.nust.edu.pk, UsmanEE970@pnec.nust.edu.pk,

hayat.umer67@yahoo.com, sajjadzaidi@pnec.nust.edu.pk

Abstract: With the increase in demand of electrical energy more burden increases on the generating stations. To reduce this burden on generating stations and to provide relief to consumer, Economical Dispatch Algorithms are used that works on principle to find the minimum cost of electrical unit. The paper looks in the formulation of economical dispatch problem and how this problem formulation can be modified to include renewable sources. Comparison of two Economical Dispatch Algorithms which include Lambda Search method and Linear Programming are further discussed and their results are also concluded using MATLAB software.

Keywords: Economical Dispatch, Linear Programming, Lambda-Search.

IEEC2017-47

Meta- Heuristic based Optimization Algorithms: A Comparative Study of Genetic Algorithm and Particle Swarm Optimization

Mohammad Affan

Department of Electrical Engineering, NED University of Engineering and Technology,
Karachi, 75290, Pakistan (m.affankhan96@gmail.com)

Abstract: - The meta heuristic based optimization algorithms have been popular in the engineering mainly because of their tendency to efficiently solve highly nonlinear, multimodal and mixed integer complex optimization problems. Genetic algorithm and particle Swarm optimization are among the most popular meta heuristic methods. GA is inspired by the evolution and genetics while PSO mechanics are inspired by the collaborative behavior of swarm. GA is similar to the PSO as these two evolutionary heuristics are population-based search methods. This paper gives an overview of the GA and PSO and verifies and reinforces the claim that both GA and PSO have identical effectiveness but PSO has significantly better computational efficiency when compared to GA. This is done by performing the comparative study between GA and PSO using STYBLINSKI-TANG and MICHALEWICZ functions as the test functions.

Keywords: Meta-heuristic, Optimization, Genetic Algorithm, Particle Swarm Optimization, Fitness function.

IEEC2017-32

Energy Conservation Through Load Balancing

Muhammad Osama bin Shakeel*, Muhammad Faheem Ali, Syed Ali Jaffar

Cdr. Sajjad Haider Zaidi

Pakistan Navy Engineering College, National University of Science and Technology,
Karachi, Pakistan(osamabinshakeel1995@gmail.com*, mfaheemali94@gmail.com, zaidi533@gmail.com,
sajjadzaidi@pnec.nust.edu.pk)

Abstract: The rapid growth of power system and the increasing trend of localized power generation will make the power system much more complex in the near future. The introduction of smart grid will result in bidirectional power flow throughout the power system. With the diverse spread of loads and sources on the low voltage side, load balancing would be a complex problem. This paper presents a novel method of load balancing on LT side of 3 phase 4 wire distribution transformer. Power engineers usually face problems with the balancing of loads on all three phases as the loads that are connected to the user end are of unpredictable and uncontrollable nature. Many a times, this causes overloading of one of the phase leaving others to be relieved. Imbalance at the distribution end results in excess amount of the neutral current, voltage drops, transformers overloading, intense energy losses, and disrupts the efficient transfer of electrical energy. It is imperative that these issues should be catered. This can be done by implementing a phase swapping technique. The paper presents an algorithm for preparing an optimized scheme for balancing of loads among phases and also proposes load balancing method using state of the art computation hardware (triac based switching circuitry). The proposed system measures the unbalance in the current of all phases and estimate loads connected to the individual phases. Phase swapping algorithm is then executed which gives the best scheme for single phase loads to produce a balance system. Triac based switching is then used to swap phases and this results in balanced system with reduced amount of current flowing through the neutral. Lastly, the paper presents a switching strategy which if implied, reduces the inrush current to a considerable level.

Keywords: energy conservation, load balancing, smart grid, triac based switching, phase identification

**TECHNICAL SESSION –VI
(Embedded Systems and Applications)**

**Session Chairs: Engr. Abdurrahman Javid Shaikh (NED),
Engr. Prof. Dr. Abdul Qadir (UIT), Engr. Dr. Sajid Saleem (NUST)**

IEEC2017-38

Edutainment System For Autistic Children

Asma Yousuf¹, Rida Irfan², Iqra Siddiqui³,
Syed Saad-ul-Hasan⁴ and Hashim Raza Khan⁵

¹²³⁴⁵ Department of Electronics Engineering, NED University of Engineering and
Technology,

Karachi, 75290, Pakistan

¹asmayousuf95@gmail.com, ²rida.irfan68@gmail.com, ³iqrasiddiqui36@gmail.com
⁴saadulhassanis@gmail.com, ⁵hashim@neduet.edu.pk

Abstract: Special education nowadays is being redefined. Since technology makes things easier for human beings, a worthy way to utilize engineering skills as addressed in this work is to develop learning system for the people with special needs. This work is all about edutaining the autistic children making use of the technology in an efficient and cost effective way. Autistic Children tends to be different from one another in many ways. The design and implementation of Edutainment System for Autistic Children helpstoimprove their fine and gross motor skills, eye-hand coordination, their focusing capability, playful skills and decision making capability using an imaging technique. The system includes a camera, a customized car, a thematic maze and a personal computer. The child performs hand gestures in front of a box containing a USB camera and inresponse ofthe backend processing of MATLAB and Arduino, the car moves intheparticular directions on the particular signals received, capturing the attention of theautistic children. For the children to remain attracted and motivated, a sound is played as the feedback on receiving the signals. The enthusiasm and excitement observed at the Centre for Autism while testing the developed system with the autistic children proved the system to be constructively effective if introduced as their learning system.

Keywords: assistive technology, embedded system, image processing, functional play, edutainment system

IEEC2017-63**Textile sensors for monitoring body movement**

Surjeet Kumar, Muhammad Junaid Sultan, Dr. Anayat Ullah¹, Dr. Zameer Shah
¹ anayat.ullah@buitms.edu.pk

Abstract: Dynamic body movement monitoring is important in sports, healthcare and human machine interface (HMI) technology. Current wearable devices used for body movement detection use rigid and uncomfortable electronic sensors. In this work we have designed smart fabric sensors that are as comfortable as normal fabrics and sense changes in their shape by proportional changes in their electrical properties. Using this relationship between mechanical and electrical properties of the sensors we can detect strain, pressure, bend and ultimately dynamic motion of human body. Skin fit garments with these sensors have been realized and tested for movement sensing in sports and healthcare. Results confirm that these sensors are sensitive to movements at different body joints such as elbow and knee.

Keywords: HMI, Electronic Sensors

IEEC2017-64**Stress Optimization for a MEMS Multilayer Fixed-Fixed Beam**

Dr. Anayat Ullah¹, Luqman Saranzai
¹ anayat.ullah@buitms.edu.pk

Abstract: MEMS based multi-layer fixed-fixed beams are used as suspensions to support the suspended membranes in tunable Fabry-Pérot (PF) filters and tunable Vertical Cavity Surface Emitting Lasers (VCSELs). The electrical and optical performance of these devices depends highly on the parallelism of the suspensions holding the membrane in place. However, the residual stress in the suspension layer(s), upon relaxation, results in bending of the suspensions, which in turn results in displacement of the membrane. Therefore, the stress induced bending in the free standing suspensions holding the membrane in place, must be minimized. A novel stress optimized multi-layer suspension system consisting of a fixed-fixed beam is designed in this work, whereby a tensile stressed material is sandwiched between two compressively stressed material films; such that the suspension layer system has an overall tensile film force, while an additional stress less layer is used to balance the clock-wise and counter clock-wise moments. The upward bending of the fixed-fixed beam is reduced from several micrometers to a mere 2.85 nm using this technique.

Keywords: MEMS, Fixed-Fixed Beam.

IEEC2017-57

Wireless Building Automation Using ESP8266: An Energy Efficient Approach

Afrah Ziauddin, Sabah Fatimah, Samra Ashraf, Iqbal Azeem and Riaz Uddin*
Department of Electrical Engineering, NED University of Engineering and Technology,
Karachi, 75290, Pakistan
(afrahzia786@gmail.com , sabahfatima_188@yahoo.com , samra.ashraf@outlook.com ,
iqbal.azeem@neduet.edu.pk , riazuddin@neduet.edu.pk*) (Corresponding author)

Abstract: With the growing security threat in the country the need of a centralized controlled security system has become necessity of time. In this project we designed a secured Wireless Building Automation System (WBAS) using Esp8266 module (IOT: internet of things). The system is controlled through webpage which is connected to the microcontroller (Arduino) operating all loads by an Esp8266 module (a long range Wi-Fi module). The building security webpage can be accessed by authorized people and loads can be controlled according to their requirements from anywhere in the world. This not only secures the building but also make it helpful in energy management of the building, saving much energy. In addition, this system is not only financially beneficial to the company or the owner, but also is a great initiative to reduce the energy crises in the country. In addition, it is cost efficient, due to the cheap Esp8266 module. Our objective is to implement a low cost, reliable and scalable Wireless Building Automation System (WBAS) that can be used to remotely switch on or off any building loads, interfacing a controller and hardware simplicity. We developed a prototype mainly aimed on the lights and the locks of the buildings to elaborate the effectiveness of the proposed approach.

Keywords: ESP8266 Module, Wireless Building Automation System, Smart Building, Arduino

TECHNICAL SESSION –VII

(Electronics Applications, Controls and Applied Computing)

Session Chairs: Engr. Dr. Hashim Raza Khan (NED), Engr. Prof. Dr. Talat Ataf (SSUET),
Engr. Dr. Arshad Aziz (NUST)

IEEC2017-43

**Actively Biased Differential Drive Rectifier circuit with Backscattering
Communication**

Asma Mahar^{1*}, Ayesha Hassan², Naveed³,
Arham Iqbal⁴, Madiha Azhar⁵, Yasir⁶, Arsalan Jawed⁷
¹²³⁶⁷PAF-KIET (Karachi Institute of Economics and Technology),

Korangi Creek, Karachi, 75190, Pakistan,

(asmamahar@pafkiet.edu.pk , ayesha.hassan@pafkiet.edu.pk ,

Naveed.21@pafkiet.edu.pk , yasir@pafkiet.edu.pk , arsalan.jawed@pafkiet.edu.pk)

^{4,5} Department of Electronic Engineering,

NED University of Engineering and Technology, Karachi, 75290, Pakistan

(arhamiqbal@neduet.edu.pk , madiha_azhar@hotmail.com)

Abstract: A differential drive rectifier with active bias mechanism to reduce diode device losses has been presented in this paper. Unlike the conventional and static Vth cancellation technique rectifiers, this configuration achieves power loss reduction in both forward and reverse biased conditions. The decrease in turn on voltage in forward bias condition, along with decrease in reverse leakage current during reverse bias condition has been achieved, hence achieving more than double efficiency. Under same input conditions (coupling coefficient 'k'=0.1 at 200MHz frequency with transmitter and receiver inductance of 22nH), actively biased differential drive rectifier was able to achieve DC voltage of 1.56V for 10kΩ load resistance in contrast to 950mV generated by full bridge rectifier. Besides being more efficient than other rectifiers, it provides regulated output DC voltage under variable coupling conditions. Backscattering communication has been performed using varactor by changing the resonance frequency of the receiver, the WPT efficiency degradation was noted to be only 7% for 200mV backscattering data amplitude.

Keywords: WPT (Wireless power transfer), backscattering, resonant circuit

IEEC2017-65

Effect of Hidden Layers in Artificial Neural Networks for Snake Robot Locomotion ControlJanzaib Masood¹, Zulkafil Abbas², Abdul Samad¹, Anayat Ullah²¹ Department of Computer Science, Faculty of ICT, BUITEMS, Quetta, Pakistan.²Department of Electronic Engineering, Faculty of ICT, BUITEMS, Quetta, Pakistan.*zulkafilabbas@gmail.com janzaibaloch786@gmail.com - corresponding author(s).

Abstract: Snake robots are hyper-redundant structures, allowing for mobility in an extensive range of challenging environments. The complex behaviors are possible due to their high degrees of freedom, unlike wheeled and legged mobile robots. The method of designing efficient movement control systems for snake robots using artificial neural networks, optimized by a genetic algorithm has proven successful. This approach outperforms the common control methods in terms of diversity, using a least a-priori knowledge of the system and its ease of implementation. Research was conducted to explore the effect of stacking hidden layers in such locomotion controllers. The locomotion controllers were trained for two gaits namely sidewinding and turning for a snake robot on a planar terrain in a 3D physics simulation engine. The locomotion controllers obtained evolved in a short time for the two gaits and efficient desired behaviors were obtained. This work proposes a strategy for selecting the size of neural network for complex locomotion of snake robots.

Keywords: Snake Robot; ANNs; Hidden Layers; Snapses.

IEEC2017-46

Efficiency Improvement of a Wireless Power Transfer SystemAyesha Hassan¹, Asma Mahar², Naveed³, Sidra Saeed Gillani⁴,Yasir Siddiqui⁵ and Arsalan Jawed⁶^{1,2,3,5,6}PAF-KIET (Karachi Institute of Economics and Technology), Main Campus, Korangi Creek, Karachi-75190, Pakistan(¹ayesha.hassan@pafkiet.edu.pk, ²asmamahar@pafkiet.edu.pk,³naveed.21@pafkiet.edu.pk, ⁵yasir@pafkiet.edu.pk, ⁶arsalan.jawed@pafkiet.edu.pk)⁴NEDUET (NED University of Engineering and Technology),

Main Campus, Karachi-75290, Pakistan

(sidragillani92@gmail.com)

Abstract: The efficiency of the power transferred through coupling is most critical in low power on-chip Wireless Power Transfer (WPT) systems. Various techniques can be used to improve this efficiency and reduce the losses at multiple stages of the design. Efficiency improvement starts with selecting proper resonant transfer topology according to design requirements. The mixed model leads to approx. 39% improvement in efficiency for comparable loads (loads with impedance similar to that of LC tank). To reduce rectifier losses a voltage multiplier circuit, using lvt-NMOS (low threshold NMOS) based switches, can be implemented instead of rectifying diodes, which provides 25% increase in DC efficiency. Further improvement in efficiency can be achieved by transmitting a high Peak-To-Average-Power-Ratio (PAPR) signal for faster switching of rectifying devices; simulation results show 11% more efficient system when using chaotic signals (which have the highest PAPR) rather than using single-frequency continuous wave.

Keywords: Wireless Power Transfer (WPT), resonance, coupling models, coupling coefficient (k), RF-DC converter, rectifier-less conversion, high peak-to-average-power-ratio (PAPR) signals.

IEEC2017-66

PLC Based Automated Bottle Filling PlantJahanzeb Khan¹, Anayat Ullah², Zulkafil Abbas^{2*}, Hamid Karim²¹SUPARCO Regional Office, Quetta, Pakistan²Department of Electronic Engineering, Faculty of ICT, BUITEMS, Quetta, Pakistan.

*zulkafilabbas@gmail.com corresponding author

Abstract: Automated bottle filling is a core production line procedure in modern industries such as pharmaceutical, chemical, food and beverage. Pneumatic actuators are ubiquitous in such state of the art industrial systems. The use of these actuators increases the overall complexity and hence cost, rendering it out of the reach of small enterprises like mineral water suppliers. In this research, we have developed an automated bottle filling and capping system that addresses the cost and complexity of the system by using solenoid valves as an alternative to the commonplace pneumatic actuators. Siemens S7-300 modular Programmable Logic Controller (PLC), optical IR sensors, and DC motor driven conveyer belt system are the major components used in the project. The language used to program PLC is Ladder Logic Diagram (LLD). The project is implemented such that the PLC takes input from electrically isolated optical sensors about the position and condition of the bottle that is to be filled and in turn controls the motor responsible for moving the conveyor belt, operates the solenoid valve and controls the motor responsible for capping. The filling and capping operation takes place in a synchronized manner. The end product is smart, has low power consumption, low operational cost, less maintenance requirements, more accuracy, simplicity in implementation and usage.

Keywords: Bottle Filling; Capping; Solenoid Valve; Optical Sensors; PLCs.

TECHNICAL SESSION –VIII (POSTERS)

Seminar Room # 2

Session Chairs: Faculty of Department of Electrical Engineering, NEDUET
Engr. Muhammad Javed, Engr. Muhammad Ali Baig,
Engr. Shoaib Siddique, Engr. Uzma Perveen, Engr. Abdullah Munir,
Engr. Fezan Rafique, Engr. Iqbal Azeem, , Engr. Syed Muhammad Zahid,
Engr. Ayesha Khan, Engr. Muhammad Farooq Siddiqui, Engr. Hiba Kamal Zuberi,
Engr. Hammad Saleem, Engr. Muhammad Furqan, Engr. Uzair Ahmed Khan,
Engr. Arshad Khan, Engr. Nimra Riaz Malik, Engr. Ayesha Saeed

IEEC2017-26

Power Line Control and Monitoring Using FPGA

Usama Bin Rehan¹, Asif Gulraiz^{2*}, Khyzer Amin³, Shayaan Amin⁴, Musa Raza⁵

² Department of Electrical Engineering , DHA Suffa University,

Karachi, Pakistan (asifgulraiz2002@hotmail.com) * Corresponding author

^{1,3,4,5} Student, Department of Electrical Engineering, Usman Institute of Technology,

Karachi, Pakistan (usama1rehan@gmail.com)

(aminkhizar@gmail.com) (shayyanamin@gmail.com)

(musa.raza95@yahoo.com)

Abstract: It demonstrates practical monitoring and controlling of an electric transmission system as smart grid does in modern power systems. The proposed system consists of a main Grid station and four Substations. Contactors are used for switching and are controlled via FPGA (Basys-3). The FPGA controls all operations in the system like monitoring and controlling of all four substations and also the supply of electricity to its desired load. Current is taken as the primary parameter which is monitored on HMI through current transformers and all commands are executed considering its rating. Some salient features of this system are, load management, power distribution and centralized supervision, monitoring and controlling can be done from centralized control room.

Keywords: Current Transformers, Transmission Lines, FPGA and Smart Grid.

IEEC2017-28

HOME AREA NETWORKS: A cost effective design and its implementation

Sana Fatima, Iqra Amjad, Maliha Yasin & Dr. Sajjad Haider Zaidi

Department of Electronics and Power Engineering,

National University of Sciences and Technology,

Pakistan Navy Engineering College, 75350, Pakistan (iqra448@gmail.com)

Abstract: Home Area Network systems represent the forefront of smart grids. Inside the smart home, the smart devices, installed, enable energy monitoring and control operations within the households, residential and industrial structures. This paper is contemplated to provide design and implementation of a cost effective, useful and reliable Home Area Network System. The main objective is to appraise all the parameters involved in the designing of a Home Area Network and come up with a best possible solution especially for the implementation of the HAN system in developing countries.

Keywords: Home Area Network, Automation, Technology, Power monitoring, Communication protocols.

IEEC2017-44

Temperature Sensors and Interface For Ultra-Low Power Microsystems

Naveed¹, Ayesha Hassan¹, Asma Mahar¹, Yasir¹,
Muhammed Mustaqim², Arsalan Jawed¹

¹ College of Engineering, Karachi Institute of Economics and technology (PAF-KIET),
Karachi, 75190, Pakistan

²Department of Electronics and Power Engineering, PNEC- NUST,
Karachi, Pakistan

(naveed.21@pafkiet.edu.pk , asmamahar@pafkiet.edu.pk ,
ayesha.hassan@pafkiet.edu.pk ,
yasir@pafkiet.edu.pk , mmustaqim@pneclust.edu.pk , arsalan.jawed@pafkiet.edu.pk)

Abstract: Ultra-low power Microsystems find their application in areas such as environmental monitoring, asset tracking, medical and control equipments. Proper choice of sensors and interface can play vital role in increasing power efficiency of such systems. This work studies and discuss various type of CMOS temperature sensors and their interface that can be chosen to improve the overall power consumption. MOSFET based temperature sensors due to their low power operations are preferred over conventional BJTs based temperature sensors. The paper discuss various topologies of MOSFET based temperature sensors and their readout interface. For low power operation, Frequency -digital conversion can be used instead of ADCs. Different type of data Convertors are discussed. Differentially Cross coupled VCO design is found to be most suitable with simulation results showing power consumption of 2~3 nW. A superior 2-T sensing element is implemented in 150nm which produce an absolute output value of 140mV with temperature coefficient of 500uV/C having power consumption of 4 nW for temperature range of -5°C to 40°C.

Keywords: Ultra low Power, Sub-threshold, PTAT, Temperature Sensor.

IEEC2017-52

**Detection and Estimation of Slip Effect on the Parameters of
DC Motor Mounted on Commuter Rail using Kalman Filter: A
Feasibility**

Shahzor Memon¹ and Riaz Uddin^{2*}

¹Department of Electronic Engineering, Hamdard University Karachi, Pakistan
(shahzor.memon@hamdard.edu.pk)

²Department of Electrical Engineering, NED University of Engineering and Technology,
Karachi-75270, Pakistan (riazuddin@neduet.edu.pk)* Corresponding author

Abstract: The paper proposes the technique of detection and estimation of slip by using parameters of motor such as torque and current for a locomotive system. The motor is used for controlling wheel-set motion mounted on each axle of the rail. As the track condition changes (due to decrease in adhesion/friction), the parameter of motor considerably varies resulting slip occurrence. By utilizing inertial mounted sensors (such as tachometer) in order to measure the velocity of the train, slip can be detected. Furthermore, the estimation of motor parameters is carried out using Kalman filter, which minimizes the usage of additional sensors. In this regard, the proposed method offers a cost effective, accurate and robust solution for the slip issue in order to avoid accidents in locomotive systems. The technique is validated using simulation results in this paper.

Keywords: Locomotive, Slip, Detection, Estimation, Kalman Filter, Rail.

Seminar Room # 3

Session Chairs: Faculty of Department of Electrical Engineering, NEDUET
Engr. Arjumand Samad, Engr. Shahnaz Tabassum, , Engr. Muhammad Umer Sajid,
Engr. Samiya Zafar , Engr. Muhammad Omar, Engr. Anila Abbas, Engr. Shariq Shaikh,
Engr. Adnan Ali, Engr. Talha Javed Soleja, Engr. Rashid Hussain, Engr. Nabeel Fayyaz,
Engr. Najia Naveed, Engr. Saddam Hussain, Engr. Muhammad Waseem Sangi,
Engr. Muhammad, Irfan Shaikh, Engr. Noor-ul-Ain

IEEC2017-29**Thermal and Electrical failure analysis of lithium-ion battery after crash**

Muhammad Sheikh^{1*}, Ahmed Elmarakbi¹ and Sheikh Rehman²,

1 Department of Computing, Engineering and technology, University of Sunderland,
 Sunderland, UK, (muhammad.sheikh@research.sunderland.ac.uk) * Corresponding
 author

2 Department of Electrical Engineering, Indus University of Engineering and
 Technology,
 Karachi, Pakistan (sheikh.ameer@indus.edu.pk)

Abstract: Due to the growing electric vehicle market and new trends to reduce fuel consumption for a healthy environment, safe and reliable vehicles are desirable for reasons beyond EV and new technology. Although certain safety standards and legislations are in place and continuously improving but number of concerns including battery safety, battery performance, vehicle structure and battery design to be considered as these affect overall reliability of Electric vehicles (EV). With this paper on the thermal and electrical failure analysis of 18650 lithium-ion battery when involve in crash/collision for Electric vehicle safety, a stone wants added to the nascent building sustainable alternatives to an energy model in disgrace. This brief addresses the uses of lithium-ion batteries as energy storage function to the convergence needs of electric transport. The term "electric transport" means both the transmission on the network and the mobility of people in electric vehicle. In the beginning of this paper, after exposure of the contextual framework and study of the research fields, scanning the subject allow to identify the main lines of research to exploit and develop.

Keywords: Lithium-ion battery, thermal runaway, crash/impact

IEEC2017-15

Analysis of The Awareness of Present Day Undergraduate Electrical Engineering Students About Contemporary Technologies An Educational Survey About FACTS Devices

Samiya Zafar^{1*}, Yusra Rauf², Fizzah³, Hira Haider⁴, and Sana⁵
 1,2,3,4,5 Department of Electrical Engineering, NED University of Engineering and Technology, Karachi, 75270, Pakistan

(Email: samiyaawm@gmail.com^{1*}, yusrarauf89@gmail.com²,
fizzahbeig@gmail.com³, hirahaider321@gmail.com⁴, sana_zh@hotmail.com⁵)

*Corresponding author

Abstract: Electrical energy demand keeps increasing every year, while the generation tries to keep pace with the increased demand, the existing transmission system fails to absorb the additional power. Extension of the current transmission system is usually not the merited solution because of huge capital input required, in addition to various environmental and political constraints. This means the transmission lines usually operate at near or even beyond their power transfer capacities. This overutilization of the lines causes reduced efficiency and increased risk of faults. FACTS - Flexible AC Transmission System devices, are used all over the world as a possible solution to these issues. FACTS are power electronic devices enabling increased control and improvement of power transmission system. This paper compiles the results of an educational survey which was carried out to check the basic knowledge of electrical engineering students, about this technology. The results of the initial survey were analyzed and a series of informative sessions were then carried out to make the students learn about FACTS devices. Other study material was also provided to the students. Another survey was then carried out to examine the change in knowledge of students and a drastic increase was observed.

Keywords: Transmission system, Energy crisis, Power factor improvement, Line capacity, Blackouts, FACTS devices

IEEC2017-20

Clustering Algorithms of Wireless Sensor Networks: A Survey

Muhammad Noman Riaz
 Department of Avionics Engineering, National University of Sciences & Technology
 Islamabad, 75230, Pakistan (mnriaz@cae.nust.edu.pk)

Abstract: In the recent few years the research on Wireless Sensor Networks (WSN) and its variants have risen enormously. The researchers all across the globe are trying to develop a routing protocol that is energy efficient and provides adequate security level in data communication. One of the techniques the researchers use is Clustering of the sensor network. This technique inherently consumes less energy during data communication as the nodes have assigned a dedicated task to perform. A total of 32 clustering algorithms / protocols have been surveyed and comparison of these protocols based on the metrics like heterogeneity, clustering method, size of the cluster etc. have been presented

Keywords: Network lifetime, cluster size, cluster count, residual energy, node degree, average network energy

IEEC2017-30**Internet Traffic Management with Multiprotocol Label Switching (MPLS)**

Muhammad Saleem, Aqeel-ur-Rehman*, Muzaffar Rao, Irfan Usmani and Fawadul haq
Department of Telecommunication Engineering, Sir Syed University of Engineering and
Technology, Karachi, Pakistan

*Hamdard University of Engineering & Technology, Karachi, Pakistan

Corresponding Author: Muhammad Saleem (msaleem@ssuet.edu.pk)

Abstract: MPLS, Multiprotocol Label Switching, is a technology developed due to the changing importance of Internet. Internet worked on “Best Effort” services while growing networks require a Quality of Service Network. The Transformations of internet into a very much useful network done by MPLS. The existing IP network works with MPLS to provide QoS and Traffic Engineering, the strongest features of the MPLS. The main objective of this paper is to analyze and compare the benefits of MPLS over simple IP networks. Simulation is being performed on a common scenario of Internet Model using NS-2 Simulator. Results clearly show the advantages of MPLS over simple IP networks when QoS is required. Some recent work of MPLS is also discussed here, supporting the same result as the outcome discussed above.

Keywords: MPLS, QoS, Traffic Engineering, IP Address, DiffServ

IEEC2017-34**Transformer Health Monitoring**

Syed Shahzeb Raza Bilgrami^{1*} Muhammad Awais Aitmad²

* Ameer Hamza³ Muhammad Farhan Siddiqui⁴ Dr. Sajjad Haider Zaidi⁵

Muhammad Salman Khan⁶ Muneeb Islam⁷

Department of Electrical Engineering,

National University of Sciences and Technology,

Pakistan Navy Engineering College Karachi, 75350, Pakistan

(sbilgrami.ee@pnec.nust.edu.pk^{1*} awais.aitmad.ee@pnec.nust.edu.pk^{2*}

ameerhamza.ee@pnec.nust.edu.pk³ farhan_75230@hotmail.com⁴

sajjadzaidi@pnec.nust.edu.pk⁵ m.salman.khan@outlook.com⁶

muneeb.islam@outlook.com⁷) *Corresponding authors

Abstract: A standard power system encounters numerous faults and crisis. Therefore, health monitoring has great potential for enhancement in the reliability of operation, reduction in consequential damage and improving operational efficiency at lower operational cost. Paper in this domain primarily focuses on distribution transformers. Transformer breakdown results in unwanted power loss. Analysis of various faults in a distribution transformer can lead us to prevent the power losses due to abrupt changes in transformer operation. An analysis of the faults like external short-circuit in transformer, high voltage disturbance, insulation breakdown between winding and earth, short-circuit of winding and faults in core of a transformer can help in estimating their occurrence. A methodology based on current signal analysis is adopted, through an embedded system. The main aim of the project is to design such type of testing system through which consumers can determine conditions of a transformer, enabling them to diagnose and repair the faults.

Keywords: Transformer; Distribution Transformer; faults; current; signal; analysis; conditions; diagnose; repair



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