

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Department of Electronics and Communication Engineering organized a Three day workshop on **“Computational Tools and Techniques for Biomedical Signal Processing- Advances in Biomedical Engineering”** by the experts from Biopac Systems, USA with Gentech Marketing and Distribution Pvt. Ltd, India from October 10- 12, 2019. It was conducted by Ms. Varnika Talwar, Ms. Taranmeet Kaur, and Mr. Manish Kumar.

The advances in biomedical engineering equipped the physiologists to acquire a wide variety of physiological signals with precision and reproducibility. BIOPAC provides Life Sciences researchers a complete range of powerful, flexible, user friendly hardware and software platforms, aptly designed for obtaining great scientific data in lab settings, MRI, and real-world environments. The Biopac instruments provide unique at the same time versatile hardware/software combinations available as, wired, wireless, wearable or MRI which can be easily used for/on human as well as experimental model systems according to physiologist's requirement. The traditional polygraph is replaced with computerized Data acquisition system (MP150) with Ethernet connectivity to record all physiological parameters in Lab environment. MP150 is a 16-channel system, which includes Acknowledge software with specialized analysis capabilities with applications to over 40 research fields. The new modules are available for electrogastrogram, microelectrode recording, noninvasive blood pressure measurement & electrical bio impedance (cardiac output), and others.

Now BIOPAC BioNomadix wearable wireless devices give freedom to record physiological parameters in real time without restrain. Physiological data can be recorded at workplace, during Yoga maneuvers, Meditation without causing discomfort to subjects. BioNomadix can provide the researcher flexibility to monitor a plethora of signals viz. ECG, EEG, EMG, EOG, EGG, EDA, Pulse, Respiration, Temperature, Cardiac Output, Heal & Toe Strike, Clench Force, Accelerometer, and Goniometer in humane settings. The New BioNomadix Logger allows participants to wear BioNomadix devices and live their lives while it records the data as per the researchers/clinician 's demand. The activity and the signals of various parameters can be 24x7 recorded and tracked using GPS. In addition, the personal audio notes can be synchronized to mark and analyze the events of interest.

BIOPAC provides a range of virtual reality (VR) immersive solutions with physiology data. VR allows you to tightly control the experimental conditions in a complex socio-physiological environment. The scientists can design experiments that are otherwise impossible or prohibitively expensive in the real world. Immersive environments can take the subject anywhere and let you unlock the boundaries of your physical lab space and budget.



BIOPAC VR is useful in studying psychophysiology, rehabilitation, neuromarketing & neuroeconomics, biomechanics & kinesiology, ergonomics, and many others.

In nutshell, Biopac instruments have given impeccable support to life science research and with the advanced BIOPAC instruments will lead the future science.

More than 250 students, 50 participants and 25 faculty members have attended the workshop.

Workshop was a joint effort of Dr. Shruti Jain (Associate Professor, Department of ECE) and Dr. Meenakshi Sood (Assistant Professor, Department of ECE).







Expert Lecture on
Biomedical Signals and Image Analysis for Affordable Diagnostic
BY PROF. DINESH KANT KUMAR, RMIT UNIVERSITY, MELBOURNE
October 10, 2019

Prof. Dinesh Kant Kumar started his talk with informing us about the most common lifestyle disease, diabetes, and how diabetes leads to chronic illness. He explains that diabetes are also more likely to have certain conditions, or risk factors, that increase the chances of having heart disease or stroke, such as high blood pressure or high cholesterol, diabetes also leads to kidney failures, affects the cornea of eyes. He gave a brief comparison between countries in health conditions, in which he compared India. India is an incredibly diverse and culturally rich country. Despite gigantic and beautiful monuments, delicious food, a booming business sector, and Bollywood, it still has some major health issues that many other countries have minimized far more successfully. These health issues affect absolutely everyone, from the poorest people to the richest ones. According to the World Bank, India ranks 146th position among the countries of

the world. Life expectancy at birth is also a yardstick of the overall quality of life in a country. According to World Health Organization, India ranks 126th position in life expectancy.

During the talk the he also informed us about the advancements of technology that can identify the symptoms of Parkinson's diseases using Signals and system processing. He also discussed the doctor patient ratio of Australia and India deficit of 600,000 doctors, and the nurse : patient ratio is 1 : 483, implying a shortage of two million nurses.

B.Tech and M.Tech students attended the lecture and interacted with him enthusiastically. He also interacted with faculty members & Ph.D Research scholar and discussed about the latest research issues. The event was coordinated by Dr. Meenakshi Sood and Dr. Shruti Jain of ECE department.



Invited Talk on

TOOLS AND TECHNIQUES IN BIOMEDICAL SIGNAL PROCESSING

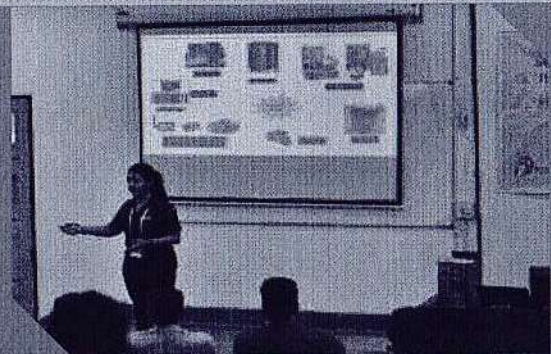
By Ms. Taranmeet, Gentech Marketing & Distribution Pvt Ltd

October 10, 2019

Miss Taranmeet from Gentech Marketing & Distribution Pvt. Ltd. gave a special talk on the topic "Tools and Techniques in Biomedical Signal Processing" on Oct 10, 2019. She acquainted the students with advancements of technology in medical domain. Gentech Marketing & Distribution is the sole distributor of BIOPAC systems U.S.A., which deals in human and animal research equipment; it is an old standard in the field of biomedical research, relentlessly assisting vision to support medical research by marketing, installation, technical and service support. It has touched more than 500+customer colleges, medical schools, R&D labs and research institutes all over India. During the talk, she also demonstrated live ECG (electrocardiogram) and PPG(pulse plethysmography) and extracted heart rate , RR interval , all this was done wirelessly on

live subjects. They have world-class hardware features, as they provide educators with the most sophisticated hardware in the industry, with a research-grade 2 or 4-channel data acquisition platforms with built-in universal amplifiers to record and condition electrical signals from the heart, muscle, nerve, brain, eye, respiratory system, and tissue preparations. The data acquisition system receives the signals from electrodes and transducers and connects to a PC running BSL software on Windows® or macOS® operating systems. BIOPAC student lab is the gold standard for life science instruction.

It was a great opportunity to know the milestones technology has achieved .Students walked out of the session enthralled after knowing the prominent role science plays in our lives.



Expert Lecture on
Security Threats to Ad-Hoc Computing: A Perspective on Sybil Attack
BY PROF. MANU SOOD, UIET, HIMACHAL PRADESH UNIVERSITY
October 11, 2019

Professor Manu Sood gave a talk on 'Security threats in Ad-Hoc Computing-a perspective of Sybil Attack'. He made the students aware about WANET and its challenges. He presented some statistics about Google query, tweeted queries and YouTube usage. He also made students familiar with attacks in WANETS like Sleep deprivation attack and black hole, further challenges in ad hoc networks like limited wireless range, packet losses and route changes. Students were made acquainted with the term Sybil attack wherein a reputation



system is subverted by forging identities in peer to peer networks.

Students of B Tech and M tech students attended the lecture and interacted with him enthusiastically. He also interacted with faculty members and Ph.D Research scholar and discussed about the latest research issues. The event was coordinated by Dr. Meenakshi Sood and Dr. Shruti Jain of ECE department.



Invited Talk on

ADVANCEMENTS METHODS OF BIOMEDICAL SIGNAL PROCESSING

By Mr. Muktesh Sharma, ADInstruments

October 11, 2019

Mr. Muktesh Sharma delivered a special session on 'Advancements methods of Biomedical Signal Processing' on Oct 11, 2019. He introduced the students with ADInstruments which is a teaching module i.e. e-learning software that helps a person understand the basics of a topic be it a language like C or signals. Teachers can use this software to make lectures which can be later shared among the students. This software also gives the students ability to perform the practical on this software virtually. Students were made aware about DELSYS which is a patent device that records



applications of such signal processing software are Ergonomics (the application of psychological



the effect on muscles of a body during activities like walking and running. Exercise Physiology System is software used to monitor the level of oxygen consumed and carbon dioxide exhaled during extensive activities. One of the practical



and physiological principles to the design of products, processes and systems), Industrial design and Robotics. The session added to the students' knowledge and made them realise the importance of technology.



Expert Lecture on
A Novel Method for Control of Wind Energy Conversion System (WECS)
BY DR. FARHAD ILAHI BAKHSH, NIT SRINAGAR
October 11, 2019

An expert lecture on 'A Novel Method for Control of Wind Energy Conversion system (WECS) was delivered by Dr. Farhad Ilahi Bakhsh of National Institute of Technology Srinagar on 11th October 2019 at JUIT campus.

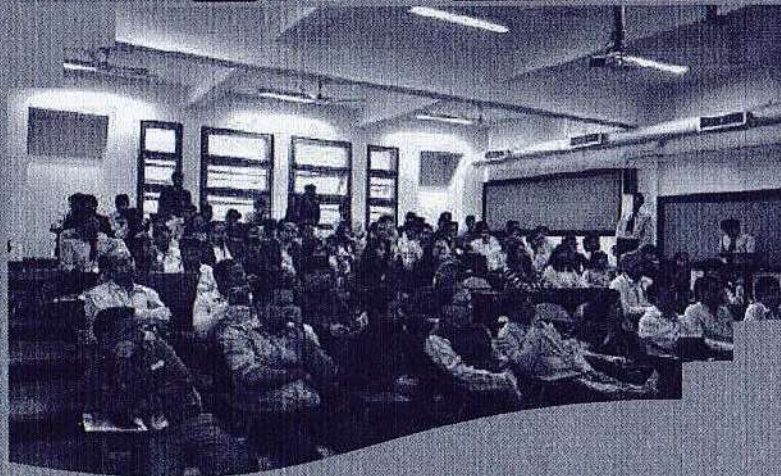
He highlighted that the conventional grid connected synchronous generator (SG) based wind energy conversion system (WECS) incorporates sophisticated power electronic control system which produces harmonics and deteriorates the quality of the power supply. Recently, a new technology i.e. variable frequency transformer (VFT) has emerged as a flexible ac link to transfer power in-between asynchronous power grids. Hence, the presented system aims to use VFT for grid integration of SG based WECS. The proposed system does not employ any power electronic control system. For analysis, the simulation models of proposed configuration as well as conventional configuration have been



developed under MATLAB/Simulink environment. A series of studies on power fed from the SG to the grid at various SG input speeds has been carried

out with the developed models. Further to analyze the effectiveness of the proposed method; the efficiency, total harmonic distortion (THD) of output voltage and THD of output current of the proposed method has been compared with those of the conventional system. From obtained results, it is observed that the proposed system is simple and does not produce harmonics. Moreover, to validate the proposed system, an experimental analysis has been carried out.

This expert lecture was coordinated by Dr. Meenakshi Sood, Dr. Shruti Jain of ECE department.



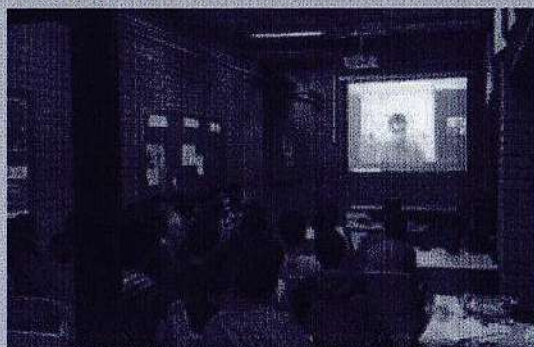
Entrepreneurship Webinar by JUIT Alumnus

MR. ASHISH AGGARWAL, HERBERT UNIVERSITY, USA

October 12, 2019

Entrepreneurship Webinar was a knowledgeable session organised by TIEDC cell. The event started at 7p.m with Mr. Ashish Aggarwal, who is JUIT alumnus and now working as Lecturer at Herbert University, USA. The topic of webinar was entrepreneurship and basics from Zero to One book. After a brief introduction, the session started with discussion on increasing general reasoning and other complex and abstract strategies. He emphasized that generating value from unconventional things, customer satisfaction and building a definite optimism. He explained competition as a destructive force and business to be taken as a qualitative measure. Students asked questions related to choosing teams for startup, the luck factor, job or start-up or higher studies

and importance of timing. The session ended with a light-hearted talk about college. The whole event was a great source of learning where students discovered new dimensions of entrepreneurship.



Orientation/Awareness Programme

USER AWARENESS ON ACM DIGITAL LIBRARY

September 26, 2019

On 26th September 2019 an expert presentation and training session on ACM Digital Library was organized by Dr. Pradeep Kumar Singh, Coordinator-JUIT, ACM Chapter HP/Computer Society of India (CSI) in collaboration with Learning Resource Center [LRC], Jaypee University of Information Technology, Wanknaghat, HP. The session was presided over by Mr. Chandrakant Tiwari (GIST Client Services) on behalf of Association of Computing Machinery (ACM).

The session was attended by B.Tech 3rd and 4th students, M.Tech students, PhD Research Scholars and

Faculty members of JUIT. Mr. Chandrakant Tiwari talked about how students/ scholars can save their time for research work using ACM Digital



Library and browse titles by subject areas, recent publications, Special Interest Groups (SIGs), literature by type, advanced search, matches fields etc., to find specific information across all ACM DL content, also talked about how to start new publications with ACM DL.

Through his talk, he informed everyone about knowledge sharing and collaboration with other team members and about building a library of articles for future references. He informed students ACM alerts on the new contents and journals of one's interest. After the session a feedback by asking questions/doubts was taken from the attendees and everyone found the session informative and useful.

