

AICTE-ATAL FDP
On
Trends in Measurement and Control for System Automation

Organized by
Dept. of Electrical and Electronics Engineering
BIT, Mesra

28.06.2021 - 02.07.2021

Final reports on FDP

On 28th of June, 2021 the weeklong Online AICTE Training and Learning (ATAL) Faculty Development Programme (FDP) course “**Trends in Measurement and Control for System Automation**”, organized by the Department of Electrical and Electronics Engineering (EEE) B.I.T., Mesra, Ranchi. The overview of FDP was presented by Dr. V. Laxmi, Co-ordinator of FDP. The welcome address was delivered by Prof. S. Chakraborty, Head of the Department of EEE and Convenor of FDP which is followed by Short Address by Dr. S. Konar, the Acting Honorable Vice-Chancellor who was the chief guest of the program. At last, Vote of Thanks was given by Dr. V. Laxmi. The workshop was sponsored by AICTE. Participants from different national level AICTE approved degree and diploma level institutions had joined to attend the course. Faculties from various recognized international level institutions like IITs, NITs, ISI, ISM, BIT, Mesra and other institutes will deliver expert lectures in the subsequent days of the weeklong workshop till July 2nd, 2015. The keynote address was delivered by Mr. Sharat Chandra Kumar, Chief of Tata Steel.

First Day (28.06.21)

In the keynote address by **Mr. Sharat Chandra Kumar, Chief of Tata Steel**, presented on “**New Automation and Instrumentation Initiatives in Process Plants**”. He discussed on the importance of automation in TATA Steel Industry. He described the different types of industrial automation and advantages of each type of automation. Also, he mentioned some of the advanced instrumentation techniques in the industry. In addition, he explained that data handling is also an important aspect for automation. He later mentioned about programming or coding required in in PLC. Finally, he mentioned about some of the international projects tied up with TATA Steel.

In the next talk, **Dr.Subhojit Ghosh** presented on the topic “**Sensors for Wide area Monitoring and Control of Power Networks**”. Here, he mentioned about the different types of sensors used in Wide Area Monitoring. In addition to that, he also talked about the use of sensor technologies in magnetic core instrument transformers which enable the performance in the different practical operating conditions.

After this talk, **Dr. Satyasai Jaggannath Nanda from NIT Jaipur** presented “**Nature Inspired Computing Tools, Advanced Optimization Techniques and their Applications**”. Here, he mentioned some of the significant advances made in the emerging field of nature-inspired computing (NIC) with a focus on the physics and biology-based approaches of different algorithms. He highlighted the importance of various algorithms that are inspired from the behaviour of ants, birds, spiders, wolves, whales etc. The various applications of these algorithms include detection of natural calamities like floods, fire in forest from the analysis of remote sensing images.

Second Day (29.06.21)

Dr. Dushmanta K Mohanta, Professor EEE Department, BIT Mesra delivered his lecture on “**Synchro Phasor Based Wide Area Measurement and Control for Smart Grid**”. The session contained a lot of valuable information about the current trend of synchro phasors which are measured by using Phasor Measurement Units (PMUs). The session focus went through the understanding and importance of measurement of grid parameters like phase angle, voltage and current etc., It explained how the synchro phasors play an important role in the wide area monitoring and control for smart grid. It also portrayed a variety of applications and current scenario of FACTS devices installed in the world geographically. The session went on to provide new ideas of research in the area to the participants.

Dr. U C Pati, Professor, ECE Department, NIT Rourkela delivered lecture on “**Automatic Recognition of Abnormal Human Activities from Surveillance Video for Smart City Applications**”. The session focused on numerous methods recognizing the human activities from video surveillance based intelligent security systems for smart city applications. Session further progressed in explaining logically the necessity of video surveillance based intelligent security systems in real-time and allowing the users to take preventive measures to reduce the damages. The session continued with lectures on different innovative areas for the participants.

Dr. Suvendu Rup, Assistant Professor, CSE Department, IIT Bhubaneswar delivered his session on “**Video Synopsis: An Intelligent Video Surveillance Framework for Smart Cities**”. The talk went on to discuss various various video surveillance frameworks. Session focused on several optimization schemes for consumer surveillance video synopsis generation like hybridization of simulated annealing and JAYA (HSAJAYA) algorithms and also hybridization of SA and Teaching Learning based Optimization (TLBO) [HSATLBO]. Session engrossed on importance of new techniques in the optimization techniques for energy minimization in surveillance video synopsis framework. The talk supplied inventive notions in the field of intelligent video surveillance framework.

Third Day (30.06.21)

On 30th of June, 2021, the first session of the day was addressed by **Mr. Vivek Kapila, MECON Ltd Ranchi**, in which he presented on the topic “**Measurement and Control in Steel Rolling Mill Automation Application**”. He discussed on the importance of automation in steel rolling mill. He described the different types of industrial automation and advantages of each

automation. Also, he mentioned some of the advanced measurement and control techniques in the industry.

In the next talk after the high tea, **Dr. Itu Snigdha of BIT mesra**, presented on the topic “**Data Handling for Cyber Physical Systems**”. Here, she mentioned the three-tier architecture and different components of cyber physical systems. In addition to that, she also talked about the workflow of cyber physical system which includes monitoring, networking, computing, and actuation which is aimed to provide feedback on the action taken and ensures correct operation in future. After this session, lunch break was taken.

The third session of the day began with the talk of **Prof. B. D. Subudhi from IIT Goa** who presented on the topic “**Control of Autonomous Underwater Vehicles**”. He mentioned some of the significant advances made in the field of Autonomous Underwater Vehicles. He also discussed some of the classical methods used in ocean exploration and highlighted the importance of motion control system with kinematics of Autonomous Underwater Vehicles.

Fourth Day (01.07.21)

The first session **Mr. Vivek Bansal**, Educator of Meditation and Yoga Philosophy, Rishikesh, Uttarakhand gave his lecture on “**Mental and Emotional Growth**”. He discussed about how emotions and feelings are driven by our thoughts. Right thought and make a person happy and a happy person can change the world. He has described the different types of parameters like Intelligent Quotient (IQ) and Emotional Quotient (EQ) in human being. He also differentiated well between positive emotions and negative emotions.

In the next session, **Dr. Sudhansu Kumar Mishra from BIT, Mesra, Ranchi** took a lab session on “**Nature Inspired Artificial Neural Networks: Applications and MATLAB Implementation**”. Here, he mentioned some of the significant advances made in the emerging field of nature-inspired swarm and evolutionary optimization techniques. He also highlighted on the recently developed variants of Artificial Neural Networks, and methodology of hybridizing it with nature-inspired optimization techniques. Finally, he explained the implementation of the models to different real world engineering problems, such as noise elimination from noisy medical images, electrical load and financial forecasting etc. Finally, he explained the utility of the neural model in cyber physical systems like smart Agriculture, healthcare and surveillance etc.

In the third and final session of the day began with the talk of **Dr. Nirbhar Neogi, Mr. Deepak Kumar from RDCIS, SAIL**, they presented the session on “**Automation Systems in Steel Industry: Challenges and Opportunities**”. Here, they have mentioned some of the significant advances made in the field of Steel Industry. They have highlighted the importance of various role of automation in energy, environment & asset management. The various applications of these enabling automation technologies for performance improvement of Steel industry were also discussed.

Fifth Day (02.06.21)

In the first session, **Mr. S. K. Swain, Assistant Professor, EEE Department, BIT, Mesra presently a Ph.D. Scholar at Kyungpook National University, South Korea**, conducted a lab session on “**Lateral Control of Automotive Vehicles**”. The session contained a lot of valuable information about state of art on automated control of vehicle by considering uncertainty parameters such as road friction. The session focused on mathematical modelling of vehicle dynamics. Further, lane-offset dynamics was also considered for obtaining steering angle using sliding-mode control. The simulation was developed on MATLAB Simulink platform.

Dr. N. Selvagesan, Professor Department of Avionics, Indian Institute of Space Science and Technology delivered his lecture on “**Non-Linearity**”. The session focused the problems and limitations centered on non-linear systems. The session explained effective tools for designing control system of non-linear systems. Further, frequency domain analysis was also discussed for various non-linear elements. Detailed mathematical analysis for stability of different non-linear system was also presented.

After the end of both technical sessions, the valedictory session was organized and feedbacks from participants were taken. Finally, the FDP came to end with vote of thanks.
