DAIS'19

SHORT TERM COURSE ON DATA ANALYSIS FOR INSTRUMENTATION SYSTEM (AICTE QIP APPROVED)

15-21 FEBRUARY, 2019

Lectures on:

- Performance characteristics of instruments
- Data processing for sensor arrays - statistical methods
- Data processing for sensor arrays - biologically inspired methods
- Electrical impedance spectroscopy as analysis of sensor performance
- Statistical data-analysis in instrumentation systems
- Introduction to gas sensors and its dynamic operation
- Role of instrumentation for protecting assets & environment in manufacturing plant
- Fundamentals of multisensor signal evaluation
- Error analysis of a linearizing digitizer for TMR angle sensor
- Multivariate data analysis using statistical methods
- Instrumentation system in steel industry

Hands-on:

- Analysis of measured data and specifications of the instrument
- Basics of data analysis
- Statistical analysis of measured data (ANOVA)
- EIS Modeling using LEVMW / MEISP software
- Computer exercises on DAV^{3}E toolbox (By Prof. Andreas Schuetze and Manuel Bastuck, Saarland University Germany)
- Computer exercises (By Prof. Andreas Schuetze and Manuel Bastuck, Saarland University Germany)

Venue:

Dept. of Electrical Engg., IIT Kharagpur

dais.iitkgp.19@gmail.com

Schedule (Everyday)

9:30am-11:30am: Lecture1

11:30am-11:45am: Tea

11:45am-1:15pm: Lecture2

1:15pm-3:00pm: Lunch

3:00pm-5:00pm: Practical session

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In instrumentation engineering, large numbers of data-sets are obtained by performing extensive experimentation. The prime objective of such experimentation is to study and analyse the performance of different processes and instrumentation systems. The next important step, after collection of data, is data-interpretation and presenting the results in a clear concise manner. In various fields of study, experimentation and data analysis play an important role in product design, manufacturing processes, development and improvement of a process. Primarily, data analysis means extraction of suitable information from the experimental results and thereby establishing an appropriate input-output relation. An experienced data analytics strives towards meaningful interpretation of experimental datasets and relates the results to suitable physical quantities which helps to improve the overall system performance. Specifications of any instrumentation system also involve the experimental data analysis.

DAIS'19 is an initiative of Instrumentation and Signal Processing (ISP) Group, Dept. of EE, IITKGP, gives a unique opportunity to come together and share thoughts, to know each other and discuss the findings of the different research groups. The course will cover the classical data analysis such as **Experimental Errors** and **Error Analysis, Least Square Curve Fitting**, **Fitting Data to Nonlinear Models**. It also cover the modern data analysis like **Clustering of Data**, **Design Experiments and conduct Hypothesis Testing using data**, and also the **Latest Trends in Machine Learning**.

DAIS'19

Chairman

Prof. Pranab Kumar Dutta

Convener

Prof. Karabi Biswas

Day 1: 15-02-2019, Friday FN: (9:30 am – 1:15 pm) Venue: N-208 Seminar room, 1st Floor, EE. Dept. IIT Kharagpur
9:30 am – 10.30 am: Inauguration
10.30am – 11.30 am: Registration
11:45 am – 1:15 pm: Lecture 1: Speaker: Prof. Siddhartha Sen, IIT Kharagpur Topic: **Performance characteristics of instruments**
Lunch break: 1:15 pm – 3 pm
AN: (3 pm – 5 pm) Venue: CCL Lab, 1st Floor, EE. Dept., IIT Kharagpur Practical Session: **Analysis of measured data and specifications of the instrument**

Day 2: 16-02-2019, Saturday FN: (9:30 am – 1:15 pm) Venue: N-208 Seminar room, 1st Floor, EE. Dept. IIT Kharagpur
9:30 am – 11:30 am: Lecture 1: Speaker: Prof. Rajib Bandyopadhyay, Jadavpur University, Kolkata Topic: **Data processing for sensor arrays - statistical methods**

11:45 am – 1:15 pm: Lecture 2: Speaker: Prof. Rajib Bandyopadhyay, Jadavpur University, Kolkata Topic: **Data processing for sensor arrays - biologically inspired methods**
Lunch break: 1:15 pm – 3 pm
AN: (3 pm – 5 pm) Venue: CCL Lab, 1st Floor, EE Dept., IIT Kharagpur Practical Session: **Basics of data analysis (By Prof. Rajib Bandyopadhyay and his team)**

Day 3: 17-02-2019, Sunday FN: (9:30 am – 1:15 pm) Venue: N-208 Seminar room, 1st Floor, EE. Dept. IIT Kharagpur
9:30 am – 11:30 am: Lecture 1: Speaker: Ms. Asmita Bose, Research Scholar, IIT Kharagpur Topic: **Electrical impedance spectroscopy as analysis of sensor performance**
11:45 am – 1:15 pm: Lecture 2: Speaker: Ms. Moupali Chakraborty, Research Scholar, IIT Kharagpur Topic: **Statistical data-analysis in instrumentation systems**
Lunch break: 1:15 pm – 3 pm
AN: (3 pm – 5 pm) Venue: CCL Lab, 1st Floor, EE Dept., IIT Kharagpur Practical Session: **Statistical analysis of measured data (ANOVA) (By Research scholars, IIT Kharagpur)**

Day 4: 18-02-2019, Monday FN: (9:30 am – 1:15 pm) Venue: N-208 Seminar room, 1st Floor, EE. Dept. IIT Kharagpur
9:30 am – 11:30 am: Lecture 1: Speaker: Prof. Andreas Schutze, Saarland University, Germany Topic: **Introduction to gas sensors and its dynamic operation**
11:45 am – 1:15 pm: Lecture 2: Speaker: Mr. Ranjan Bhattacharya , HPCL, Haldia Topic: **Role of Instrumentation for protecting assets & environment in manufacturing plant**
Lunch break: 1:15 pm – 3 pm
AN: (3 pm – 5 pm) Venue: CCL Lab, 1st Floor, EE Dept., IIT Kharagpur Practical Session: **EIS Modeling using LEVMW / MEISP software (By Research scholars, IIT Kharagpur)**

Day 5: 19-02-2019, Tuesday FN: (9:30 am – 1:15 pm) Venue: N-208 Seminar room, 1st Floor, EE. Dept. IIT Kharagpur
9:30 am – 11:30 am: Lecture 1: Speaker: Prof. Andreas Schutze, Professor Saarland University, Germany Topic: **Fundamentals of multisensor signal evaluation**
11:45 am – 1:15 pm: Lecture 2: Speaker: Mr. Nandapurakar Kishore Bhaskarrao, Research Scholar, IIT Kharagpur Topic: **Error analysis of a linearizing digitizer for TMR angle sensor**
Lunch break: 1:15 pm – 3 pm

AN: (3 pm – 5 pm) Venue: CCL Lab, 1st Floor, EE Dept., IIT Kharagpur Practical Session: **Computer exercises on DAV^{3}E toolbox (By Prof. Andreas Schuetze and Manuel Bastuck, Saarland University Germany)**

Day 6: 20-02-2019, Wednesday FN: (9:30 am – 1:15 pm) Venue: N-208 Seminar room, 1st Floor, EE. Dept. IIT Kharagpur
9:30 am – 11:30 am: Lecture 1: Speaker: Prof. Andreas Schutze, Saarland University, Germany Topic: **Multivariate data analysis using statistical methods**
11:45 am – 1:15 pm: Lecture 2: Speaker: Prof. Subhasis Chaudhuri, Former Head in Design & Engineering, R&D for Iron and Steel, SAIL Topic: **Instrumentation in steel industry**
Lunch break: 1:15 pm – 3 pm
AN: (3 pm – 5 pm) Venue: CCL Lab, 1st Floor, EE Dept., IIT Kharagpur Practical Session: **Computer exercises (By Prof. Andreas Schuetze and Manuel Bastuck, Saarland University Germany)**
(5 pm – 5:30 pm): Valedictory session
Day 7: 21-02-2018, Thursday: Campus tour and visit to Nehru Museum, Departure of the participants

Registration Details:

Commencement of Registration Form submission	15th December 2018, Saturday
Closure for submission of online Registration Form	11th January 2019, Friday
Publication Date of Selected Candidates	15th January 2019, Saturday

Please send the **signed copy of filled up registration form**, to following mail id: dais.iitkgp.19@gmail.com , **before 6:00 pm, 11th January, 2019.**

Registration Fee:

Faculty and other academic personnel with accommodation:	Rs. 1500
Research scholars with accommodation:	Rs. 1000
PG and UG (4th year/ 5th year only) students with accommodation	Rs. 500

Account details for fee submission will be sent to the selected candidates only.
Accommodation includes lodging only. Working lunch will be provided to all. Breakfasts and dinners are not included in accommodation. Accommodation will be provided from 5:00 pm 14-02-2019 to 2:00 pm 21-02-2019.

For any further query, please mail dais.iitkgp.19@gmail.com .

DAIS'19

Registration Form

1. Name:
2. Designation:
3. Date of Birth: Gender:
4. Nationality:
5. Permanent Address:

6. Name of the Organization:
7. Address of the Organization:

8. Mail id:
9. Contact Number:
10. Accommodation Needed?
11. Food preference: Veg/Non-veg?

(Signature of the participant with date)

Please sign the filled up form and send the scanned copy to dais.iitkgp.19@gmail.com with subject name: 'Registration DAIS'19_First name_Last name' before 11th January 2019. Details on Registration Fee is given in Brochure. Account details will be sent to the shortlisted candidates only, on 15th January 2019. For any further query, please mail dais.iitkgp.19@gmail.com .