



This course is specially designed to give a coverage of fundamentals of different optimization and estimation techniques used in modern control systems. Further, the course aims for use of these techniques to different engineering systems such as control of power system, power Electronics & Drives and Robotic applications.

It is expected that this course will be suitable for engineering professionals from academia, R&D organizations as well as industries.

Key Speakers:

Prof. Bidyadhar Subudhi, NIT
Rourkela

Prof. Asim Kr. Naskar, NIT Rourkela

Prof. Pravat Kumar Ray, NIT Rourkela

Prof. Sandip Ghosh, IIT BHU

Prof. A.K. Deb, IIT Kharagpur

Registration Form

1. Name: _____
2. Designation: _____
3. Specialization: _____
4. Department: _____
5. Organization: _____
6. Research/Teaching/Industry Experience: _____

7. Mailing Address: _____

Phone: _____

Email: _____

8. Accommodation required: YES / NO

9. Payment of Course Fee:

DD No. _____

Date: _____ for Rupees _____

On Bank _____

10. Signature:

11. Place and Date:

NATIONAL INSTITUTE OF TECHNOLOGY ROURKELA

announces
a
Short Term Course

On
**OPTIMIZATION AND
ESTIMATION TECHNIQUES IN
CONTROL APPLICATIONS**

12th -16th June, 2018



Co-ordinators

Prof. Bidyadhar Subudhi
Prof. Asim Kr Naskar

Organized by

**DEPT. OF ELECTRICAL ENGINEERING
NATIONAL INSTITUTE OF TECHNOLOGY
ROURKELA – 769008, ODISHA**



Introduction

Optimization and estimation techniques play a major role in the process of decision making to control autonomous systems. The modern control engineering involves multi-input-multi-output dynamical systems subjected to process and measurement noises with uncertainties in modelling and constraints on inputs and states. New control strategies, e.g., robust control, optimal control, passivity based control are evolved to address the new control challenges. It has been observed that in many cases, the control problems can be casted as a convex-optimization problem, hence efficient techniques are developed to solve them.

Very often, while designing a controller, the designer may not have the opportunities to measure state/parameter explicitly. Parameters of a dynamical system need to be estimated for several applications including fault detection, reconfigurable control design and many more. Hence, a number of estimation techniques are developed in the recent past to facilitate engineers to design controller in case of parameter uncertainty. It is also necessary to design efficient parameter/state estimator, for achieving appropriate observer based controller design for many real world systems.

The course focuses on a series of classes covering both the fundamentals and recent advances in

estimation and optimization techniques and its application to different areas of Engineering. Also the course is aiming to provide hands-on experience on related MATLAB programming and Hardware experiments. Thus, these will supplement the theory sessions covered in the class room sessions.

Course Coverage

- Introduction to convex optimization techniques, Lagrange multiplier, solution by interior point method and its complexity analysis.
- LMIs in analysis and synthesis of control problems. Solving LMIs
- Estimator properties including error bounds and convergence.
- Parameter Estimation techniques such as: Least Square estimation (LSE), Instrumental Variables (IV), Maximum Likelihood.
- Nonlinear Least Squares.
- Recursive estimation of Linear dynamical systems: RLS, RIV, RML, Kalman Filter.
- Application to Power System and Robotics

Venue

The course will be organized at the Dept. of EE, National Institute of Technology (NIT), Rourkela. It is one of the institutes of national importance for technical education and is funded by the Government of India. It is situated at the eastern end of Rourkela steel city, beyond Sector-1 over an area of 262 hectares of land. NIT Rourkela has twenty one academic departments which offer B.Tech, M.Tech and PhD programs in various areas of engineering and technology. It has ten centers of Excellence including two centers hosted by the Department of Electrical Engineering namely Centre of Excellence on Industrial Electronics & Robotics and Renewable Energy Systems. The Institute is a participant of the Technical Education Quality Improvement program of Government of India.—it has figured in Times Ranking 401-500 and in NIRF 12.

Registration

The course fees given below in the form of demand draft drawn in favour of “Continuing Education, Rourkela” payable at SBI, NIT Branch, Rourkela (code - 2109) to be sent to the coordinator on or before 20th May 2018. The course fee will cover expenses towards registration kit, lecture notes and tea only. The number of seats is limited to 50. Therefore, interested faculty members should apply well within the scheduled time frame i.e.20th May 2018.

Category	Registration Fee in INR
Faculty Members from Engineering Institutes	5000
Engineers from Industry and Scientists from R&D Organizations	6000
Research Scholars	3000

Accommodation

Accommodation and food for participants shall be arranged in the Institute’s Guest House. The expenses towards these will be paid by the participant directly to the guest house.

Contact Us

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Coordinator

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