

MHRD Scheme on Global Initiative on Academic Network (GIAN)

ADVANCE LEVEL COURSE

ON

“ESTIMATION, TRACKING and INFORMATION FUSION”

Overview

This course will provide a solid foundation to estimation theory and its application to signal processing, communications, surveillance, automotive industry and biomedical engineering. Starting from the definitions of Bayesian and non-Bayesian estimation paradigms, the proposed course will cover in detail the theoretical aspects of parameter estimation, linear state estimation, nonlinear state estimation and adaptive state estimation. The proposed course will also address real-world use of estimation theory in various domains of application.

Module	ESTIMATION, TRACKING and INFORMATION FUSION Duration: 04-12-2017 to 08-12-2017 Maximum number of participants for the course = 50		
Day1 (04.12.2017)	Lecture 1	Introduction on estimation and its applications on tracking.	1 Hour
	Lecture 2	Basic concepts: Maximum likelihood (ML) estimation, Maximum a posteriori (MAP) estimation, Least squares (LS) estimation.	1 Hour
	Lecture 3	Minimum mean square error (MMSE) estimation, Linear MMSE (LMMSE) estimation	1 Hour
	Practical 1	Problem solving session with examples	2 Hour
Day 2 (05.12.2017)	Lecture 4	LS estimation for linear systems	1 Hour
	Lecture 5	LS estimation for non-linear systems	1 Hour
	Lecture 6	Modelling stochastic dynamic systems	1 Hour
	Practical 2	Problem solving session with examples	2 Hour
Day 3 (06.12.2017)	Lecture 7	The Kalman filter for discrete time linear dynamic systems with Gaussian noise (Session-I)	1 Hour
	Lecture 8	The Kalman filter for discrete time linear dynamic systems with Gaussian noise (Session-II)	1 Hour
	Lecture 9	Steady state filters for noisy dynamic systems	1 Hour
	Practical 3	Problem solving session with examples	2 Hour
Day 4 (07.12.2017)	Lecture 10	Adaptive multiple model estimation techniques (Session-I)	1 Hour
	Lecture 11	Adaptive multiple model estimation techniques (Session-II)	1 Hour
	Lecture 12	Adaptive multiple model estimation techniques (Session-III)	1 Hour
	Practical 4	Problem solving session with examples	2 Hour
Day 5 (08.12.2017)	Lecture 13	Nonlinear estimation techniques	1 Hour
	Lecture 14	Computational aspects of discrete time estimation	1 Hour
	Lecture 15	Extensions to autocorrelated noise and smoothing	1 Hour
	Practical 5	Problem solving session with examples	2 Hour
Date of Examination:	MCQ Type Test	08th December, 2017	1 Hour
Who can attend	<ul style="list-style-type: none"> • Executives, engineers and researchers from manufacturing, service and government organizations including R&D laboratories. • Students at all levels (B.Tech/MSc/M.Tech/Ph.D) or Faculty from reputed academic institutions and technical institutions. 		
Registration process and Fee	<ul style="list-style-type: none"> • The applicant are required to get themselves register on GIAN web portal (http://www.gian.iitkgp.ac.in) to apply for any number of GIAN courses as and when necessary. • The course registration fee is separate. The participation fees (Demand draft drawn in favour of Director, NITK Surathkal, payable at Surathkal for taking the course is as follows: <ul style="list-style-type: none"> ▪ Participants from abroad : US \$500 ▪ Industry/ Research Organizations: Rs 8000 		

- Faculty Members from Academic Institutes: Rs 5000
- Students/Research Scholars: Rs 2500
- The above fee include all instructional materials, computer use for Practical and Assignments, laboratory equipment usage charges, 24 hr free internet facility. The participants will be provided with accommodation, if available, on payment basis.

Foreign faculty: Prof. Thia Kirubarajan



Thia Kirubarajan (S'95 M'98 SM'03) received the B.A. and M.A. degrees in electrical and information engineering from the University of Cambridge, Cambridge, U.K., in 1991 and 1993, respectively, and the M.S. and Ph.D. degrees in electrical engineering from the University of Connecticut, Storrs, CT, USA, in 1995 and 1998, respectively.

He is the Distinguished Engineering Professor and the Canada Research Chair in Information Fu

sion at McMaster University, Hamilton, ON, Canada. He has authored or co-authored about 350 research articles, 11 book chapters, one standard textbook on target tracking, and four edited volumes. He has lead multiple projects on tracking and fusion with support from the Canadian Department of National Defence, U.S. Air Force, U.S. Navy, NASA, the Natural Sciences and Engineering Research Council of Canada, the Ontario Ministry of Research and Innovation, General Dynamics Canada, Raytheon Canada, ComDev/exactEarth, Toyota, Mine Radio Systems, Qualtech, FLIR Radar Systems, and Lockheed Martin Canada.

As part of his research at McMaster University, he led the design and development of the distributed multisensor-multitarget tracking testbed for scenario generation, tracking algorithm development, and performance evaluation. In addition to conducting research, he has worked extensively with government laboratories and companies to process real data and to transition his research to the real world. Through his company TrackGen (www.trackgen.com), he has developed a number of software programs, including MultiTrack for real-time large-scale multisensor-multitarget tracking, MultiFuse for distributed tracking, SceneGen for surveillance scenario simulation, and ISR360 for visualization, performance analysis, and situation awareness, which have been integrated into many fielded systems. He has received the Ontario Premiers Research Excellence Award and the IEEE AESS Barry Carlton Award.

Host Faculty: Dr. Pathipati Srihari



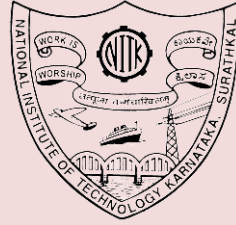
Pathipati Srihari (S'98 M'04 SM'10) graduated B.Tech, ECE from Sri Venkateswara University in 2000 and did masters degree in Communications Engineering and Signal Processing from University of Plymouth, England, UK in 2001. He obtained PhD from Andhra University in the field of radar signal processing in 2012. He is currently working as an assistant professor at National Institute of Technology Karnataka, Surathkal. He worked as a visiting Assistant Professor at McMaster University, Canada in 2014. He has thirteen years of teaching and research experience. He received 2010

IEEE Asia Pacific Outstanding Branch Counselor Award.

He is a Senior Member of Institute of Electrical and Electronics and Engineers Inc (IEEE) (USA) and a Senior Member of Association of Computing Machinery (USA). He is a Fellow of IETE and a member of IEICE, Japan. His research interests are radar target tracking, radar waveform design and efficient DSP algorithms for radar applications. He is conducting collaborative research with McMaster University.

**Advance Level Course
On
“Estimation, Tracking and Information Fusion”**

Organized by



**Department of Electronics & Communication Engineering,
National Institute of Technology Karnataka, Surathkal**

Supported by



GIAN

**(Global Initiative for Academic Networks)
MHRD, GOVT. OF INDIA**

Duration: 04-12-2017 to 08-12-2017

Venue: NITK Surathkal, Mangaluru

Last Date for sending filled registration form along with DD: 08-11-2017

Contact Address:

Dr. Pathipati Srihari

Course Coordinator

Department of Electronics and Communication Engineering, National Institute of Technology
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National Institute of Technology Karnataka, Surathkal
MHRD Scheme on Global Initiative for Academic Networks (GIAN)

Advance Level Course
On
“Estimation, Tracking and Information Fusion”

Duration: 04-12-2017 to 08-12-2017

Registration Form

1. Name of applicant:-----

2. Designation & Department:-----

3. Mailing Address: -----

4. Tel: (Réidence):-----

(Mobile):-----

(Office): -----

5. Email:-----

6. Qualification:-----

7. Experience: Teaching:-----

and Industrial:-----

8. Comment on your exposure: -----

9. Fee Payment Details

Amount Rs: -----Demand Draft No. : -----

Bank: -----and Date: -----

10. Category of participants:

Faculty/Student/Research scholar of NITK

Faculty/Student/Research scholar of Outside NITK

Industry/Research Organizations

11. Require accommodation Facility? : Yes / No

I agree to abide by the rules and the regulations governing the GIAN–MHRD Course and I will attend the course for entire duration.

Place:

Date:

Signature of the applicant

Note:1. Filled registration form with Demand Draft should be send to the course coordinator.
2. Demand draft drawn in favour of Director, NITK Surathkal, payable at Surathkal