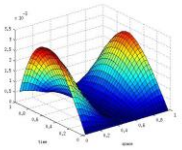
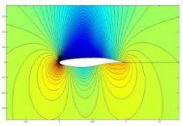


INVERSE &CONTROL PROBLEMS

MAY 16-27, 2016 (IISER TVM)



An MHRD Scheme on GLOBAL Initiative on Academic Network (GIAN)

Objective and Scope

Inverse and Control Problems have become very active, interdisciplinary research area over the past two decades. Both inverse problems and control problems are closely related to each other and have found wide application in science and engineering, industry, medicine, finance as well as life and earth sciences.

The term *inverse problem* refers to the problem of determining unknown quantities based on observations of their effects. This is in contrast to the corresponding direct problem, the solution of which involves finding effects based on a complete description of their physical parameters. Inverse problems are typically harder to solve numerically than direct problems since they are often ill- posed, in contrast to direct problems which are, in general, well –posed.

Optimal control problems arise from the necessity to control and influence the behavior of physical systems by as little external effort as possible. Many physical systems are based on mathematical models involving partial differential equations. The purpose of Optimal Control is to influence the behavior of a dynamical system in order to achieve a desired goal. *Optimal control* has a large variety of applications where the dynamics can be controlled optimally, such as aerospace, aeronautics, chemical plant, mechanical systems, finance and economics, but also to solve *inverse problems* here the goal is to determine input data in an equation from its solution values.

The objective of this programme is to provide a forum for researchers from the world to present and exchange their latest research achievements on Inverse Problems and Optimal Control, as well as their applications. It also aims to promote collaborative research on Inverse Problems and Optimal Control in India and abroad. This will encourage international collaboration and interactive activities on inverse problems and optimal control and provide an opportunity for young researchers and students to learn the current state of the art techniques in the fields and interact with experts in this field**.**

Topics covered in the programme

1. Direct and Inverse Problems
2. Control Problems
3. Applications.

Who Can Attend

• Students at all levels (BTech/BS-MS/MS/MTech/), Researcher Scholars and Post Docs, and Faculty from academic institutions.

• Executives, engineers and researchers from manufacturing, service and government organizations including R&D laboratories.

Pre-requisites: Basic Knowledge in Functional Analysis and Partial Differential Equations.

The number of participants will be limited to 50.
The number of credits will be 2.

Registration Fees

Category		Fee for Indian Participants	Fee for Foreign Participants
Academic Institutions	**Students**	**NIL**	**$100**
	Post Doc Fellows	**Rs.500**	**$200**
	Faculty	**Rs. 1000**	**$500**
Industry/ Research Organization		**Rs. 20000**	**$500**

Last Date of Receipt of application: April 15, 2016.

INTERNATIONAL EXPERT

Dr. Sergei Pereverzyev is working as a Senior Fellow in Inverse Problems and Mathematical Imaging at Johan Radon Institute of Computational and Applied Mathematics (RICAM) Austria. He is an expert in the areas of Inverse and Ill-Posed Problems, Functional Analysis, Approximation Theory, and Complexity Theory. He is a recipient of International Prize for Achievement in Information-Based Complexity in 2000. He served in many academic institution as an international expert. Some of the positions he held are:

- Scientific staff member of the Institute of Mathematics, Ukrainian Acad. of Sci.
- Visiting professor at the Department of Mathematics at the Beijing Normal University (China)
- Visiting professor at the Department of Computer Sciences (temporary C4-position) at the University of Kaiserslautern (Germany)
- Visiting professor at the Department of Mathematics (temporary C4-position) at the University of Kaiserslautern (Germany)
- Visiting professor at the Department of Mathematics (temporary C4-position) at the University of Kaiserslautern (Germany)
- Research Scientist in the group "Inverse Problems" at the RICAM.

ORGANIZING COMMITTEE & NATIONAL EXPERTS

	Dr. M.T. Nair obtained his Ph.D from IIT Bombay. He was a faculty at Goa University. He has visited University of Grenoble; University of Kaiserslautern; Australian National University; Sun-Yat Sen Unversity, for research purpose. He is a recipient of C.L. Chandna award for distinguished and outstanding contribution to mathematics research and teaching in India. His area of research is Inverse and Ill-posed Problems and Operator Theory. He is currently a Professor and Head of the Department of Mathematics at IIT Madras. URL: https://mat.iitm.ac.in/home/mtnair/public_html/
	Dr. Nandakumaran is a Professor in the Department of Mathematics, IISc Bangalore . He obtained his Ph.D from TIFR. He is a visiting Professor in many foreign universities. His area of research is Optimal Control Theory and Partial Differential Equations. He is a recipient of C.V. Raman young scientist award. URL: http://math.iisc.ernet.in/~nands/
	Dr. Raju George is a Professor and Dean(R&D) at Indian Institute of Space Science and Technology, Thiruvananthapuram. He obtained his Ph.D from IIT Bombay. He was a visiting faculty at University of Delaware, USA. He has also visited University of Manitoba, Canada and Universite Paul Sabatier, France for research purpose. He was a faculty at M S University of Baroda and University Institute of Chemical Technology, Mumbai. His areas of research are Mathematical theory of control, Soft computing and Industrial mathematics. URL: https://www.iist.ac.in/mathematics/george
	Dr. N. Sukavanam is a Professor in Department of Mathematics, IIT Roorkee. He obtained his Ph.D from Indian Institute of Science, Bangalore. He has visited many foreign universities for research purpose and his area of research is Control Theory and Applications. URL: http://www.iitr.ac.in/departments/MA/pages/People+Faculty+Sukavanam_N_.html

	Dr. Santhosh George is a Professor and Head of the Department of Mathematics and Computing Science, National Institute of Technology, Surathkal. He obtained his Ph.D. from Goa Univesity. He visited many universities in abroad for research purpose. His area of research is Inverse and Ill-posed problems. URL: http://macs.nitk.ac.in/faculty/santhosh-george
	Dr. M.P. Rajan (IISER TVM) is the coordinator of this programme. He received his Ph.D from IIT Madras. He was a faculty at IIT Guwahati and Anna University. He has visited University of Linz, Austria; Stanford University, USA and University of Kaiserslautern for research purpose. He also worked in top notch investment bank as a quant. His area of research is Inverse and Ill-posed Problems and Mathematical Finance. He has a blend of academic and industrial expertise and honoured with best teacher award by IISER TVM. He is currently the Professor and Dean (Academics) of IISER TVM. URL: http://www.iisertvm.ac.in/faculties/rajanmp

Course Coordinator

Dr. M.P. Rajan

Professor, School of Mathematics

Indian Institute of Science Education and Research Thiruvananthapuram

CET Campus, College of Engineering P.O

Sreekaryam, Thiruvananthapuram-695016

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Phone: 0091-471-259-9411

To apply for this course/workshop, please follow the instructions at http://gian.iisertvm.ac.in/invcon