



Department of Biomedical Engineering

Manipal Institute of Technology, Manipal University,
Manipal – 576 104



3 Day Workshop on Basics of Optimization: Theory and Practice

May 4-6, 2017

Optimization is ubiquitous and occurs in all knowledge and application areas: engineering, physics, mathematics, economics, social sciences, medicine, conflicts, administration, commerce, and even politics. And in engineering, it is encountered in almost all branches like mechanical, electrical, civil, nuclear, information sciences, biomedical engineering and healthcare, etc. The typical areas of application include design, scheduling, planning, forecasting, approximations, quality control, and budgeting. Most of the innovations, technological improvements, or savings in effort and cost involve optimizing some given parameter or the other. Hence a thorough understanding of optimization theory and its applications is very useful and provides a great opportunity for an exciting and an expert career.

In this three day workshop you will learn basics of optimization theory and algorithms for various optimization methods and techniques. You will also be given hands on programming training using MATLAB for most of the algorithms we teach you. We do not make use of any built in MATLAB commands for optimization. Instead, we make you implement the algorithms and use them to solve some of the typical optimization problems. This will enhance and reinforce your understanding of the algorithms.

Course Contents:

1. **Fundamentals:**

- Basics of Linear Algebra
- Basics of Geometry
- Basics of Calculus
- Introduction to Optimization Terminologies

2. **One Dimensional Search Methods**

- Dichotomous Search Method
- Golden Section Search Method
- Fibonacci Search Method
- Secant Method
- Interpolation Methods

3. **Multidimensional Gradient Methods**

- Steepest Descent Method
- Newton's Method
- Gauss-Newton Method

4. **Conjugate Methods**

- Conjugate Direction Method
- Conjugate Gradient Method

5. **Quasi Newton Methods**

- DFP Method
- BFGS Method

6. **Constrained Optimization**

- Lagrange Multipliers
- First Order Necessary Conditions
- Second Order Necessary Conditions

Resource Person:



Dr. Ganesh Murthy C.N.S.

Principal Engineer
Mercedes-Benz Research and Development India Pvt Ltd.
Whitefield Bangalore - 560066

Registration Fee (in Rupees) *

P.G. Students / Research Scholars	: 1,000/-
Faculty	: 2,000/-
Industry Professionals	: 3,000/-
• Last date for Application (with full CV & Statement of Purpose)	: April 25, 2017
• Confirmation of Selection	: April 28, 2017 (latest)
• No. of Seats	: 30

* **To be paid after confirmation of selection** – intimated to you by Email
(as soon as possible, and at the latest by April 26, 2017)

*NOTE: The workshop Awards the "Best Participant".

For Enquires/Application/Registration Contact:

Dr. Ramesh R. Galigekere, Convener

Professor & Head

Department of Biomedical Engineering
Manipal Institute of Technology, Manipal University
Manipal – 576104, Karnataka, INDIA.

Tel: +91 820 2924214

Email: biomed@manipal.edu

Website: www.manipal.edu

For online payment

Beneficiary name: **Manipal University – Conference/ Workshop**
Address: Manipal University, Manipal – 576104
Bank: State Bank of India
Branch: Manipal | Branch code: 04426
Account type & Number: SB #33508958510
IFSC Code: SBIN0004426 | MICR Code: 576002006

NOTE: Those registered online are requested to communicate the details of their transaction to the department
Email: biomed@manipal.edu



Department of Biomedical Engineering
Manipal Institute Of Technology, Manipal - 576 104



Diamond Jubilee Lecture-series

You are cordially invited to

Lecture - 5

Matrix Estimation: An Application to Signal Denoising

By



Dr. Prabin K Bora
Professor, EEE Department
IIT Guwahati, Guwahati, Assam

Date & Time

Saturday, May 06, 2017
10:00 AM

Venue

AB5 – 212

Dr. Ramesh R Galigekere
Professor & Head, Dept. of BME, MIT, Manipal

All are Welcome



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Diamond Jubilee Lecture-series

You are cordially invited to the

Lecture - 3

Imaging in Nuclear Medicine

By

Dr. Rajesh Kumar
HOD, Nuclear Medicine,
KMC, Manipal

Date & Time

Friday, 07 April 2017
3:00 PM

Venue

AB5 - 315

Dr. Ramesh R Galigekere
Professor & Head, Dept. of BME, MIT, Manipal

All are Welcome



**MANIPAL
INSTITUTE OF TECHNOLOGY**
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The Department of Biomedical Engineering
A Constituent institution under Manipal University.

Cordially invites you for an Interactive Session on

"New frontiers in sensing technologies from nano- to macro-"

By

Dr. Rajeshwari Kumar,
Research Scientist, Outreach Program,
The University of Texas at Dallas, USA.

Abstract: The talk covers broad aspects of upcoming trends in cutting edge technologies in the field of biosensors and healthcare applications. Developing research areas include point-of-care device design and lab-on-a-chip platform for early diagnosis of diseases towards understanding the field of theranostics.

Also, several higher education opportunities will be discussed as part of the presentation to provide insights into student Masters and Doctoral program and fellowship/scholarship opportunities abroad.

Date & Time

09th Feb 2017

11:30 – 12.30 Noon

Venue

AB5, Room No - 315

Dr. Ramesh R Galigekere
Professor & Head, Dept. of BME, MIT, Manipal

All are Welcome



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Diamond Jubilee Lecture-series

You are cordially invited to the

Lecture - 4

Molecular basis of Learning and Memory

By

Dr. RV Omkumar
Scientist-F and Head
Molecular Neurobiology Division
Rajiv Gandhi Centre for Biotechnology
(Department of Biotechnology, Govt. of India)
Thiruvananthapuram, Kerala

Date & Time

Tuesday, 11 April 2017
3:00 PM

Venue

AB5 - 315

Dr. Ramesh R Galigekere
Professor & Head, Dept. of BME, MIT, Manipal

All are Welcome

Mr. Sanjeev Hiremath delivered a talk on the topic “From the Flying Hospital to Error Log Data Analytics - journey of a Biomedical Engineer” on 18/01/2017





**MANIPAL
INSTITUTE OF TECHNOLOGY**
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**The Department of Biomedical Engineering
Manipal Institute of Technology, Manipal
Cordially invites you to the inauguration of the
Three-day workshop**

On

Kalman Filters – Theory and Practice

On 20th October, 2016 at 9 a.m.

VENUE: Sir M V Hall, MIT, Academic Block-II

Chief Guest

Dr. Ganesh Murthy C.N.S.

Technical Manager

Mercedes-Benz Research & Development India

Dr. B H V Pai

Joint Director, MIT, Manipal
Will preside over the function

Dr. Ramesh R Galigekere, Convener

Prof. & Head
Dept. Biomedical Engineering

From: Venkatesan V S [MU-MIT]

Sent: Wednesday, October 19, 2016 9:51 AM

To: Ramesh Galigekere [MU-MIT]; Lawrence D. Almeida [MU-MIT]; Muralidhar G. Bairy [MU-MIT]; Devdas Bhat [MU-MIT]; Niranjana S [MU-MIT]; Rajitha K V [MU-MIT]; Sheeba Davis [MU-MIT]; Hilda Mayrose [MU-MIT]; vivek143pinto@gmail.com; biomed1519@gmail.com; mallika.singh@gmail.com; Harikishan Shetty

Subject: Brief presentation by Dr Anil Bhatt, HOD Orthopaedics

Dear all:

Dr Anil Bhatt, HOD ORTHO will give a brief talk on 'Problems in Orthopedics' . This is not a routine subject talk but is aimed at developing new and practical solutions for the problems they face.

The talk will be in one of the class rooms (212 or 211) in AB5.

Those interested in R&D in this area are most welcome to attend. I am circulating this to 3rd,5th and 1st M Techs.

Regards

Venkatesan

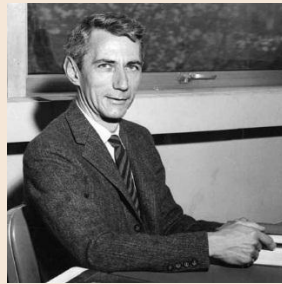


MANIPAL UNIVERSITY

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SHANNON CENTENARY LECTURE SERIES



You are cordially invited to the
Lecture – 1

**Shannon's Information Theory: Applications in Medicine
& other far flung fields**

By

Dr. Pitchaiah Mandava

Baylor College of Medicine, Houston, Texas
Adjunct Professor
Dept. of Biomedical Engineering, MIT, Manipal



Date & Time

24th Oct 2016

11:00 AM

Venue

Sir M V Hall, MIT

Academic Block 2, MIT

Dr. Ramesh R Galigekere

Professor & Head, Dept. of BME, MIT, Manipal