

Faculty Information



Prof. Gaurav Sharma is with the University of Rochester, where he is a Professor in the Department of Electrical and Computer Engineering, Department of Computer Science, Department of Biostatistics and Computational Biology, and Department of Oncology. From 2008-2010, he served as the Director for the Center for Emerging and Innovative Sciences (CEIS), a New York state supported center for promoting joint university-industry research and technology development, which is housed at the University of Rochester. From 1996 through 2003, he was with Xerox Research and Technology in Webster, NY first as a member of research and technology staff and then as a Principal Scientist and Project Leader. He received the Ph.D. in Electrical and Computer Engineering from North Carolina State University, Raleigh, NC, and masters degrees in Applied Mathematics from NCSU and in Electrical Communication Engineering from the Indian Institute of Science, Bangalore, India. He received his bachelor of engineering degree in Electronics and Communication Engineering from Indian Institute of Technology, Roorkee (formerly, Univ. of Roorkee). Professor Sharma is a fellow of the IEEE, a fellow of SPIE, and a fellow of the Society for Imaging Science and Technology (IS&T). For more information visit:

<http://www.ece.rochester.edu/~gsharma/>



Dr. Surya Prakash is currently an Assistant Professor in Discipline of Computer Science and Engineering at Indian Institute of Technology Indore, India. He received his MS and PhD degrees in computer science and engineering from Indian Institute of Technology Madras, India and Indian Institute of Technology Kanpur, India respectively. His research interest

includes image processing, computer vision, pattern recognition, biometrics, and identity and infrastructure management. He has published several research articles in peer-reviewed international journals and conferences. He has also co-authored two books titled "IT Infrastructure and Its Management" published by Tata McGraw-Hill, India and "Ear Biometrics in 2D and 3D: Localization and Recognition" published by Springer. He has also been in the program committees of several international conferences in the field of pattern recognition, image processing and intelligent computing. For more information please visit:

<http://iiti.ac.in/people/~surya/>

Topics Covered

- 1. Review of Basics:** Basic probability concepts, probability spaces and events, independence and conditional independence, Bayes rule, discrete and continuous probability distributions, joint, conditional, and marginal distributions.
- 2. Probabilistic Models:** IID models, Mixture models, Markov Chains and Processes. Hidden Markov Models (HMMs), Stochastic Context
- 3. Inference and Parameter Estimation:** Clustering using mixture models, Expectation Maximization (EM), Viterbi and Forward-Backward recursions for Hidden Markov Models, Inside-Out and Cocke-Younger-Kasami (CYK) algorithms for Stochastic Context Free Grammars.
- 4. Dynamic Programming and Belief Propagation:** Dynamic programming and Belief Propagation as generalized abstractions for common algorithms, Implementation issues: scaling and computational scheduling options..
- 5. Applications and Approximation:** Decoding of Convolutional, Low Density Parity-Check (LDPC), & Turbo Codes as an instance of Belief Propagation, Natural language processing and biomolecular sequence and structure modeling using HMMs and SCFGs.

Who Should Attend the Course ?

1. Research scholars, graduate students, researchers from different organization across the country working in the field of machine learning, computer vision, image analysis and coding theory.
2. Young researchers working in R & D laboratories related to machine learning, computer vision, image analysis, and coding theory across the country.
3. Faculty members and academicians interested in research in the field of machine learning, computer vision, image analysis, pattern recognition and coding theory

Course Co-ordinator

For any further information and registration, please contact:

Dr. Surya Prakash

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Research Group on Biometrics, Pattern Recog. & Computer Vision,
Discipline of Computer Science & Engineering,
Indian Institute of Technology Indore, Indore-453552, India.
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GLOBAL INITIATIVE ON ACADEMIC NETWORK Gian

10 Days Course

On

PROBABILISTIC MODELS AND BELIEF PROPAGATION

August 1 -10, 2016

UNDER THE AEGIS OF
MINISTRY OF HUMANE
RESOURCE DEVELOPMENT



Organized By

Discipline of Computer Science & Engineering
Indian Institute of Technology Indore
Indore -453552

Overview

A probabilistic model (also sometimes referred as graphical model), provides a statistical analysis tool in which a graph expresses the conditional dependence structure between random variables. It has the ability to estimate the probability of an event occurring again on the basis of past data. Belief propagation deals with performing inference on probabilistic models, such as Bayesian networks and Markov random fields. Probabilistic models and Belief propagation are commonly used in artificial intelligence, machine learning and information theory. It has been successfully applied in the development of numerous applications in the field of computer vision, artificial intelligence, machine learning, statistical physics and coding theory.

Objective of this course is to understand and learn how to use probabilistic models and belief propagation in creating artificial intelligence systems. It aims at providing the advance knowledge on probabilistic models and belief propagation. The courses will be useful for the people working in the research areas such as image analysis, computer vision applications, biometrics, target recognition, space applications, speech processing, neural computing, forensics, bioinformatics and coding theory

Schedule of The Course

Date : **August 1 -10, 2016**
 Total Number of days/lectures : **10 days / 30 lectures**

Registration Fee:

Registration	Early Registration (on or before June 10, 2016)	Late Registration (on or before July 10, 2016)	After July 10, 2016 or onsite
Participant from outside India	USD 500	USD 600	USD 650
Participant from Industry/ Business organization	Rs. 20,000	Rs. 24,000	Rs. 26,000
Participant from Academic Institution	Rs. 5,000	Rs. 6,000	Rs. 6,500

The fee includes all instructional materials, computer use for tutorials, and lunch. The participants will be provided with single bedded accommodation on payment basis.

How to Apply

Step 1: Payment of Registration Fee:

Payment for the registration fee can be made through online/offline mode. Online payment can be made through **NEFT transfer** and offline payment can be made through **Demand Draft**. Details regarding payment are as follows:

- (i) **By Demand Draft:** Demand Draft should be drawn in favor of “**Registrar, IIT Indore**”, payable at Indore. Demand Draft should be drawn from SBI, ICICI, HDFC, Axis Bank, Bank of India, Corporation Bank, Canara Bank or IDBI bank only.
- (ii) **By NEFT Transfer:** Transfer the amount to the account number given below:

A/C No: 31702151577

Name: Indian Institute of Technology Indore
(Project & Consultancy Account)

Bank: State Bank of India

Branch: Khandwa Road

IFS Code: SBIN0011779

MICR Code: 452002029

Step 2: Registration: After completing the payment of registration fee, fill the application form available <http://gian.iiti.ac.in/register.php> to complete the registration.

If payment is made through Demand Draft, send your Demand Draft to the following address (also e-mail the scanned copy of the Demand Draft to surya@iiti.ac.in):

Dr. Surya Prakash

Assistant Professor,

Discipline of Computer Science and Engineering,

Indian Institute of Technology Indore,

Simrol Campus, Khandwa Road,

Indore – 453552, India.

Registration can be also be done offline by filling the form printed in this brochure and sending it along with Demand Draft (print of the online payment receipt if payment is made online) to above mentioned address.



A 10 Days Course On

Probabilistic Models And Belief Propagation

Registration Form

August 1 -10, 2016

Personal Details:

Name of the Applicant :

Designation:

Affiliation:

Address for Correspondence:.....

.....

.....

Phone:.....

E-mail:.....

Details of Bank Draft:

Draft number:

Bank Name:

Branch Name:.....

Amount Rs.Dated/...../2016

Accommodation Required:

YES : No:

Note: **Accommodation can be arranged on payment basis.**

(Signature of Candidate)

Note: A photocopy of this form can also be used for the registration .