

Advanced Techniques and Methodologies of Big Data Associated with Science and Engineering

Overview

"A significant constraint on realizing value from Big Data will be a shortage of talent, particularly of people with deep expertise in statistics and machine learning ... we project that demand for deep analytical positions in a big data world could exceed the supply being produced on current trends by 140,000 to 190,000 positions." -McKinsey Big Data report.

With the advancement of information technology, high performance computing and extensive use of social media have resulted in unprecedented amount of data, so called the BIG DATA. Proper analysis of big data permeates science, engineering, public health, medicine and policy makings. This requires multidisciplinary teams work together with domain experts from computational science, mathematics and statistics. Statistics is fundamental in extracting meaningful information from the ocean of data and absolutely necessary for making inferences before any conclusion can be made. "Off the shelf" methods are often not applicable to handle big data. Advanced techniques tailored to big data analysis are necessary for the development of next generation data analytic workforce.

There are already many initiatives taken by the advanced countries where the training and research in this area in full swing. This course will be one such initiative in India and there is no other institution than IIT Kanpur can take the lead and then spread within India and other partner country.

Course Coordinator

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Modules	<p>i) Main Components : Introducing the concept of big data and its inherent complicity, Introducing state-of-the-art statistical techniques to handle big data, Conceptualize the foundation and computational issues, In depth look for example data from science, engineering and business, Hands-on experiments with big data :</p> <p>ii) Duration : February 3, 2018 to February 7, 2018 (5 days):12 hours lectures and 11.5 hours tutorials.</p> <p style="text-align: center;">Number of participants for the course will be limited to twenty -five.</p>
You Should Attend If...	<p style="text-align: center;">All engineering students at all levels (BTech/MSc/Mtech/Ph.D) interested in this area.</p> <p style="text-align: center;">Students with background in Statistics, Mathematics, Computer Science and Information management</p>
Fees	<p>The participation fees for taking the course is as follows: Participants from abroad : 500 USD Industry/ Research Organizations: 3000 INR Academic Institutions: 2000 INR A copy of the instructional material will be provided. The participants can be provided with accommodation.</p>

The Faculty

Prof. Tapabrata Maiti



Dr. Tapabrata (Taps) Maiti is currently the Professor and Graduate Director in the Department of Statistics & Probability and the Co-director for the Center for Business and Social Analytics at Eli Broad College of Business at Michigan State University. He joined the MSU faculty in 2008 as a full professor. Later he was awarded as Michigan State Foundation Professor. A world leading researcher in Statistics and a fellow of the American Statistical Association, Institute of Mathematical Statistics, previously worked in several renowned institutions: Iowa State University, U.S. Census Bureau, University of Nebraska- Lincoln and Harvard Medical School.

Dr. Maiti's research highlights a unique combination of skills and expertise in statistical theory and methods with a firm focus on application to real life data. In statistics, his expertise includes spatio-temporal modeling, high-dimensional predictive models, hierarchical modeling and brain image data analysis. He has substantial experience working with secondary health data collected by US agencies such as the National Center for Health Statistics and Center for Disease Control and Prevention. His works have been published in numerous prestigious Journals over the years, including the Annals of Statistics, Journal of American Statistical association, Journal of Royal Statistical Society, Series B, Annals of Applied Statistics, Biometrika, Biometrics, Scandinavian Journal of Statistics, Survey Methodology, Journal of Statistical Planning and Inference, Statistica Sinica, IEEE Transactions on Automatic Control and Statistics in Medicine. Dr. Maiti served in editorial board for many prestigious journals like Journal of American Statistical Association, Statistica Sinica and Spanish Journal of Statistics, TEST.

Dr. Maiti's most recent awards and honors include: Michigan State Foundation Professorship, 2017; Fellow, Institute of Mathematical Statistics, 2012 and, Fellow the American Statistical Association, 2010.

Dr. Subhra Sankar Dhar

Dr. Subhra Sankar Dhar is currently an assistant professor in Statistics at the IIT Kanpur, India. Dr. Dhar did PhD in Statistics in the Theoretical Statistics and Mathematics Unit in Indian Statistical Institute, Calcutta under supervision of Prof. Probal Chaudhuri. After finishing PhD, he was in the University of Cambridge, UK as a Post doctoral research associate. In 2013, he came back to India and joined at the Presidency University as an assistant professor in Statistics. After spending a brief period there, he joined at the IIT Kanpur on July 1, 2013. He holds visiting position in Michigan State University (as a visiting assistant professor from August 2015 to December 2015) and in London School of Economics and Political Science, UK (from May-July 2014 and May-June 2016 as a visiting research associate) and Ruhr University, Germany (May-June 2017 as a visiting research associate).

Dr. Dhar's research interest presently includes non-parametric regression, analysis of functional data, measure of association, data depth and quantiles. His works have been published in prestigious journals like Scandinavian Journal of Statistics, Electronic Journal of Statistics, Bernoulli and Statistica Sinica. Besides, he served as a reviewer for many journals like Journal of Multivariate Analysis, Statistica Sinica, Statistics and Probability Letters etc.

Dr. Dhar has already 2 PhD students, and he is also co-supervisor of another PhD student, who is pursuing PhD at the University of Melbourne, Australia. He also supervised several master students at the IIT Kanpur and of other academic institutes (like Indian Statistical Institute, Calcutta) in India. He has already taught several courses in Statistics at the IIT Kanpur, Michigan State University, USA, Presidency University and Indian Statistical Institute, Calcutta.