Global Initiative of Academic Network

Course Title: Physics and biology inspired optimization, machine learning, data mining techniques and their applications in big-data, medical, science and engineering disciplines.

Overview

In today's highly competitive environment, optimized use of resources play a key role to success. This course focuses on generalized approaches for computational optimization problems that may have near-universal applicability. The initial part will focus on traditional approaches that includes Markov chain processes- essential formalism and the schematic of Google's page rank algorithm, machine learning, V-C dimensions etc. Later the focus will shift to other generalized data modelling techniques, such as Reverse Monte Carlo, entropy of information etc. To the end, a relatively new branch of statistical physics "Community detection" and other advanced tools will be introduced and their applications to data mining, Big-data, software architecture, medical diagnostics, materials discovery and design etc. will be discussed.

Date	13 May 2019 – 22 May 2019
Lectures	1. Prof. Zohar Nussinov : 20 hrs lecture 2. Dr. Kisor Kumar Sahu and Prof. Manoranjan Satpathy : 8 hrs lecture 3. Dr. Kodanda Ram Mangipudi and Bamdev Mishra : 4 hrs lecture
Who can attend?	Software professionals, Persons involved in big-data analytics and business intelligence, Professionals using medical imaging, engineers, material scientist, physicist, chemist and researchers working on computational optimization problems, M.Tech, B.Tech and other students.
Fees	The participation fees for taking the course is as follows: **Students:** INR 2000/- **Faculty members:** INR 5000/- **Industry personal:** INR 7500/-

Faculty

Dr. Zohar Nussinov,

Zohar Nussinov received his B.Sc. from Tel-Aviv University and his PhD from UCLA in 2000. He joined Washington University, St. Louis in 2005 as assistant professor. Currently he is an associate professor in the physics department at same university. His current research interest include statistical learning tools, condensed matter physics, the application of simple statistical mechanics and classical mechanics ideas to graph theory and satisfiability problems, "quantum critical points". His work has been published in many renowned journals like physical review letters, physical review E, scientific reports, condense matter physics etc.

Dr. Kisor kumar Sahu

Kisor Kumar Sahu received his PhD from Kyoto University in 2006. He also worked with NASA for levitation experiments in a synchrotron facility (APS, USA). He joined IIT Bhubaneswar as assistant professor in 2012. Together with Dr. Nussinov and Dr. Satpathy, Dr. Sahu and his students, Mr. Raj Kishore and Mr. R. Krishnan, pioneered the use of 'Big-data-analytics' tools in the field of granular media.

Dr. Manoranjan Satpathy

Manoranjan Satpathy has received his PhD from IIT Bombay in 1997. His research interest includes Software testing and verification, software engineering and formal methods. He has published more than forty articles in renowned journals. He joined IIT Bhubaneswar as assistant professor. He has more than eight years of teaching experience and seven years of industrial experience.

Dr. Kodanda Ram Mangipudi

Dr. Kodanda Ram Mangipudi is currently working as an Assistant professor at IIT Bhubaneswar. He has received his PhD from University of Groningen, The Netherlands in 2012. He has also served as a Scientist II, in Institute of High Performance Computing, A*STAR, Singapore. His major research includes mechanical behavior cellular solids, metal foams, bone, and nanoporous metals, Deformation and fracture at nanoscales, Acoustic and phonon band gap engineering, Surface elasticity, Phase-field modelling of microstructural evolution.

Dr. Bamdev Mishra

Bamdev Mishra has received his PhD from University of Liège and Bachelors and Masters degrees from IIT Bombay. He is currently working as a Senior Applied Scientist at Microsoft in the Office India Intelligence team at Hyderabad, India. Prior to this, he worked in the India Machine Learning team at Amazon in Bengaluru, India. He has also spent a year as a visiting Research Associate at the University of Cambridge in the control group.

Course Coordinator

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