

AVVISO DI SEMINARIO

Martedì 21 Febbraio 2017, ore 11:30, Aula del Consiglio

Swarm Intelligence Methods and Optimization Problems in Big Data Analytics

prof. Soumya Mohanty

Big Data applications generically require the use of flexible, hence high-dimensional, models to capture meaningful patterns in the data, and this usually leads to challenging non-linear and non-convex global optimization problems. The large data volume that must be handled further increases their difficult nature. This course will introduce methods from the field of computational swarm intelligence (SI) that are useful for solving such optimization problems. SI is a metaheuristic inspired by observations of cooperative behavior in multi-agent biological systems. This relatively new paradigm follows in the wake of well-known biology inspired optimization methods such as Genetic Algorithms. The course will introduce several SI methods, with the focus being on an in-depth presentation of PSO -- Particle Swarm Optimization. PSO shows a remarkable robustness across a wide range of optimization problems, reducing the burden that is generally involved in tuning stochastic global optimization algorithms to obtain good performance. In terms of practical applications, optimization problems from a diverse range of Big Data fields will be considered with a focus on some recent successes achieved with SI methods on data analysis challenges in Astronomy.



Soumya D. Mohanty, Professor of Physics at UTRGV, completed his PhD degree in 1997 at the IUCA, India., and held post-doctoral positions at Northwestern University, Penn State, and the Max-Planck Institute for Gravitational Physics. He was also a visiting scholar with the LIGO project at Caltech. Mohanty's research has focused on solving some of the important data analysis challenges faced in the realization of Gravitational Wave Astronomy across all observational frequency bands.. He is the recipient of several grants, from the RC, the U.S. NSF and NASA, in support of this work.