AAI Advanced Analytics Seminar Series on 15/06/2012 (two seminars)

The first Seminar

Seminar Title: Multiagent Learning Through Neuroevolution
Speaker: Risto Miikkulainen, Professor of Computer Sciences and Neuroscience, the University of Texas at Austin
Date and Time: 10:00am to 11:00am, the 15th of June 2012 (Friday)
Seminar Room: UTS City Campus Building 10 CB10.02.320 (2 minutes walk from Tower Building CB01 of UTS)
Seminar Chairman: Prof Longbing Cao (longbing.cao@uts.edu.au)

Abstract: Neuroevolution is a promising approach for constructing intelligent agents in many complex tasks such as games, robotics, and decision making. It is also well suited for evolving team behavior for many multiagent tasks. However, new challenges and opportunities emerge in such tasks, including facilitating cooperation through reward sharing and communication, accelerating evolution through social learning, and measuring how good the resulting solutions are. In this talk I will review recent progress in these three areas, and suggest avenues for future work.

Short biography of the speaker: Risto Miikkulainen is a Professor of Computer Sciences at the University of Texas at Austin. He received an M.S. in Engineering from the Helsinki University of Technology, Finland, in 1986, and a Ph.D. in Computer Science from UCLA in 1990. His current research focuses on methods and applications of neuroevolution, as well as models of natural language processing, and self-organization of the visual cortex; he is an author of over 250 articles in these research areas. He is currently on the Board of Governors of the Neural Network Society, and an action editor of IEEE Transactions on Computational Intelligence and AI in Games and IEEE Transactions on Autonomous Mental Development.

The Second Seminar

Seminar Title: Evolutionary multi-objective optimization: Past, present, and future
Speaker: Dr. Carlos A. Coello Coello, Chair of the Computer Science Department at CINVESTAV-IPN in Mexico City, Mexico
Date and Time: 12:00noon to 1:00pm, the 15th of June 2012 (Friday)
Seminar Room: UTS City Campus Building 10 CB10.02.320 (2 minutes walk from Tower Building CB01 of UTS)
Seminar Chairman: Prof Longbing Cao (longbing.cao@uts.edu.au)

Abstract: During the last thirty years, there has been an increasing interest in using heuristic search algorithms based on natural selection (the so-called "evolutionary algorithms") for solving a wide variety of problems. As in any other discipline, research on evolutionary algorithms has become more specialized over the years, giving rise to a

number of sub-disciplines. This talk deals with one of the emerging sub-disciplines that has become very popular due to its wide applicability: evolutionary multi-objective optimization (EMOO). EMOO refers to the use of evolutionary algorithms (or even other biologically-inspired heuristics) to solve problems with two or more (often conflicting) objectives. Unlike traditional (single-objective) problems, multi-objective optimization problems normally have more than one possible solution. Thus, traditional evolutionary algorithms (e.g., genetic algorithms) need to be modified in order to deal with such problems. This talk will provide a general overview of this field, including its historical origins, its most significant developments (mainly related to the design of algorithms), some of its most important application areas and some of its current research challenges.

Short biography of the speaker: Carlos Artemio Coello Coello received a BSc in Civil Engineering from the Universidad Autonoma de Chiapas in Mexico in 1991 (graduating Summa Cum Laude). Then, he was awarded a scholarship from the Mexican government to pursue graduate studies in Computer Science at Tulane University (in the USA). He received a MSc and a PhD in Computer Science in 1993 and 1996, respectively. His PhD thesis was one of the first in the field now called "evolutionary multiobjective optimization". He currently has over 320 publications which report over 6,200 citations (his h-index is 42).

Dr. Coello has been a Senior Research Fellow in the Plymouth Engineering Design Centre (in England) and a Visiting Professor at DePauw University (in the USA). He is currently full professor with distinction (Investigador Cinvestav 3F) and Chair of the Computer Science Department at CINVESTAV-IPN in Mexico City, Mexico.

He has delivered invited talks, keynote speeches and tutorials in Spain, USA, Canada, Switzerland, UK, Chile, Colombia, Brazil, Peru, Uruguay, Argentina, India, Italy, China and Mexico. He has served as a technical reviewer for over 80 international journals and for more than 100 international conferences and actually serves as associate editor of the journals "IEEE Transactions on Evolutionary Computation", "Evolutionary Computation", "Journal of Heuristics", "Soft Computing", "Pattern Analysis and Applications", "Memetic Computing" and "Computational Optimization and Applications", and as a member of the editorial boards of the journals "Engineering Optimization", and the "International Journal of Computational Intelligence Research".

He is member of the Mexican Academy of Science, the Association for Computing Machinery, and of Sigma Xi, The Scientific Research Society. He is also a member of the Mexican National System of Researchers (Level 3, which is the highest possible). As of January, 2011, he is also an IEEE Fellow for his "contributions to multi-objective optimization and constraint-handling techniques".

He is the only computer scientist in Mexico who has received the "National Research Award" (in 2007) from the Mexican Academy of Science (in the area of exact

sciences), since its inception, in 1961 (this is the most prestigious scientific award granted in Mexico to scientists under the age of 40). He has also received the "Medal to the Scientific Merit" from Mexico City's congress and the "Ciudad Capital: Heberto Castillo 2011 Award" in Basic Science.

His current research interests are: evolutionary multiobjective optimization and constraint-handling techniques for evolutionary algorithms.

Overview to This Seminar Series

The Advanced Analytics Seminar Series presents the latest theoretical advancement and empirical experience in a broad range of interdisciplinary and business-oriented analytics fields. It covers topics related to data mining, machine learning, statistics, bioinformatics, behavior informatics, marketing analytics and multimedia analytics. It also provides a platform for the showcase of commercial products in ubiquitous advanced analytics. Speakers are invited from both academia and industry. It opens regularly on every Friday afternoon at the garden-like UTS Blackfriars Campus. You are warmly welcome to attend this seminar series.

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