

## **Simulated Evolution and Learning (SEAL-2010) Conference**

1<sup>st</sup> – 4<sup>th</sup> December 2010

SEAL is a prestigious international conference series in evolutionary optimization and machine learning. This biennial event started in Seoul, South Korea in 1996 and thereafter has been held in Canberra, Australia in 1998; Nagoya, Japan in 2000; Singapore in 2002; Busan, South Korea in 2004; Hefei, China in 2006; and Melbourne, Australia in 2008.

The eighth SEAL-2010 conference was held in IITK. 141 research papers were submitted from 30 countries. After a rigorous peer-review process involving 431 reviews in total (averaging a little more than 3 reviews per paper), 61 full-length and 19 short papers were accepted for presentation (including oral and poster presentations) at the conference. The accepted papers covered a wide range of topics in simulated evolution and learning. They were classified into the following general categories: (i) Theoretical developments, (ii) Evolutionary algorithms and applications, (iii) Learning methodologies, (iv) Multi-objective evolutionary algorithms and applications, (v) Hybrid algorithms and (vi) Industrial applications.

The conference had three distinguished keynote speakers.

**Prof. Narendra Karmarkar** – His talk titled ‘**Beyond convexity: New perspectives in Computational Optimization**’ focused on providing new theoretical concepts for non-convex optimization and showcased an intelligent intermingling of fields of optimization, advanced geometry and mathematical physics.

**Prof. Manindra Agrawal** – His talk on ‘**Primes is in P**’ presented a much-improved version of his celebrated and ground-breaking 2002 work on a polynomial time algorithm for testing prime numbers. The theoretical computation work presented in this lecture was motivating for the evolutionary optimization and machine learning community at large.

**Prof. Toshio Fukuda** – His talk on ‘**Intelligent Robot for Multi-mode Locomotion**’ discussed how multiple locomotions adopted by animals could be mimicked in developing highly robust robots for performing different tasks. The learning behaviors portrayed in the talk were hugely interesting to researchers in evolutionary learning and robotics alike.

The conference also included two tutorials whose topics were chosen from two complementary areas of evolutionary computing. **Prof. B. Yegnanarayana's** tutorial on Artificial Neural Networks and Applications in Optimization systematically introduced the principles of artificial neural networks (ANN) and their applications in various problems. The other tutorial by **Dr. Debabrata Goswami** on Quantum Computing introduced the fast-growing methodologies of quantum computing techniques. The ideas presented in the tutorials motivated the researchers to look for possible collaborative activities between the two fields. They made an excellent start to the four-day conference which ended with a local sightseeing trip.

The conference was financially supported by the Golden Jubilee Committee, IIT Kanpur; the Department of Science and Technology (DST), New Delhi; and the Council of Scientific and Industrial Research (CSIR), New Delhi. Helpful financial contributions were also made by Esteco, Italy and USA; General Electric, Bangalore; General Motors, Bangalore; and TCS Innovation Lab, Delhi.