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CALL FOR PAPERS

IEEE Congress on Evolutionary Computation

September 25 - 28, 2007, Singapore

http://www.cec2007.org

The conference proceedings of CEC have been continuously included in the EI Compendex Database and IEEE Xplore.

The annual IEEE Congress on Evolutionary Computation (CEC) is one of the leading events in the area of evolutionary computation. It covers all topics in evolutionary computation, including, but not limited to:

- Ant colony optimization
- Artificial life
- Bioinformatics & bioengineering
- Coevolution & collective behavior
- Combinatorial & numerical optimization
- Constraint & uncertainty handling
- Evolutionary design
- Evolutionary intelligent agents
- Evolutionary robotic & control systems
- Evolving neural networks & fuzzy systems
- Molecular & quantum computing
- Particle swarm intelligence
- Representation & operators
- Artificial immune systems
- Autonomous mental & behavior development
- Cognitive systems & applications
- Computational finance & economics
- Evolutionary data mining
- Evolutionary games
- Evolutionary learning systems
- Evolvable hardware & software
- Memetic & hybrid algorithms
- Multiobjective optimization
- Real-world applications
- Theory of evolutionary computation

CEC 2007 features a world-class conference that aims to bring together researchers and practitioners in the field of evolutionary computation and computational intelligence from all around the globe. Technical exchanges within the research community will encompass keynote speeches, over 30 special sessions, over 10 tutorials and workshops, panel discussions as well as poster presentations. On top of these, participants will be treated to a series of social functions, receptions and networking sessions, which will serve as a vital channel to establish new connections and foster everlasting friendship among fellow counterparts.

About Singapore

Singapore is a vibrant commercial and financial hub, which at the same time also serves its role as a melting pot for the fusion of a diverse mix of many different cultures. Its cosmopolitan outlook brings the best of the east and west together and draws in millions of tourists every year. Visitors to this tropical island resort will be treated to a great array of interesting attractions, festival celebrations and cultural events, not forgetting the one-stop shopping and eating experience in this entertainment paradise. The conglomeration of all the different elements will definitely give visitors of Singapore an exciting and unforgettable experience.

Student Travel Support

The IEEE/CIS Student Travel Grant Program offers a number of travel grants to assist IEEE/CIS Student Members presenting papers at IEEE CEC 2007. For more information, please see the conference website at http://www.cec2007.org.

Best Paper Awards

The Evolutionary Programming Society will sponsor two Best Student Paper Awards and one Best Overall Paper Award at CEC 2007. These awards will be presented at the banquet. The winners will be chosen by the EPS Board of Directors based on the technical merit of the accepted papers to CEC 2007.

Important Dates

Paper submission is **NOW** open.
Paper Submission Deadline: **March 15, 2007**
Decision Notification: **May 15, 2007**
Camera-ready Submission: **June 15, 2007**

IEEE Computational Intelligence Society

IEEE

KC Tan
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CEC 2007 Conference Report

The 2007 Congress on Evolutionary Computation (CEC) was held in Singapore, from the 25th to the 28th of September 2007. This conference attracted numerous participants, bringing together students, researchers and practitioners from an array of universities and laboratories internationally, all sharing a similar interest and passion in the field of evolutionary computation. All the participants converged onto the Swissotel, the venue for this conference, located right in the center of Singapore near the business district with numerous shopping and entertainment outlets surrounding it.

In total, there were 1115 paper submissions (a record for CEC) from more than 70 countries. Many papers demonstrated useful systems with strong analytical and empirical analyses. Each paper was reviewed by at least two reviewers (most papers received three reviews each). Based on these rigorous reviews, IEEE CEC 2007 accepted 653 papers for inclusion in the conference program, which represents an acceptance rate of 59 percent, of which 410 oral presentations were held and the remaining, as poster contributions—all of which helped contribute to a successful conference, for advancement within the field of evolutionary computation.

The conference takes place as the field of evolutionary computation begins to be more widely appreciated and accepted by the general research community, in particular the numerous industries that would benefit from the use of the many novel approaches and innovative methods within the field of evolutionary computation. With that in mind, and with confer-

ence participants convening annually to discuss their work, the conference serves as a useful backdrop for which the future of evolutionary computation can be strategically mapped.

Three plenary talks were held, in the mornings of each conference day, by the invited keynote speakers—Xin Yao (*A Rigorous Theoretical Framework for Measuring Generalisation of Co-evolutionary Learning*), Gary Fogel (*Medical Applications of Evolutionary Computation*), and Simon Lucas (*Games, and the Design of New Hybrid Eolutionary and Temporal Difference Learning Algorithms*)—following which two invited talks were held (per day)—Jong-Hwan Kim (*Evolvable Artificial Creatures*), Peng-Yeng Yin and Fred Glover (*Hidden (Tabu) Secrets of Successful Evolutionary Search Methods*), Marc Schoenauer (*Bio-Inspired Continuous Optimization: The Coming of Age*), Hisao Ishibuchi (*Hot Issues in Evolutionary Multiobjective Optimization*), Robert G. Reynolds (*Cultural Algorithms: Harnessing the Power of Social Intelligence*), and Hugo de Garis (*Artificial Brains: An Evolved Neural Net Module Approach*).

Nine tutorials were also organized as part of the pre-conference program, covering the fundamentals with a state-of-the-art discussion of emerging areas of research. There were thirty-one special sessions organized by domain experts that encompassed the technical scope of the conference. In addition, three plenary poster sessions were planned which allowed for one-on-one interactions between the presenters and the audiences. In all, seventy-two parallel sessions of oral presentations were held throughout a three-day period.

Aside from oral and poster presentations, five competitions were organized,

—Neural Network Othello, Car Racing, Ms. Pac-Man, X-Pilot AI, and multi-objective optimization. These competitions provided an excellent opportunity for participants to test their algorithms and architectures and compare them against the best that other researchers around the globe could offer. The winner of each competition received a USD500 prize and a certificate that was presented at the conference banquet. For the Ms. Pac-Man competition, rather unfortunately, the default toolkit scored higher than those obtained from the participants and hence the prize went unclaimed for this conference. The Othello competition and the X-Pilot AI competitions failed to attract the minimum five entrants and so were not officially run.

The game-related competition to attract the greatest number of entries was the Simulated Car Racing competition organized by Julian Togelius. The success of this competition is due largely to Julian's hard work and excellent competition design. Julian provided simple interfaces to connect the car controllers to the game, and also provided an extensive toolkit including sample neural network and heuristic controllers. Congratulations go to Ho Duc Thang and Jon Garibaldi (University of Nottingham, UK), on their winning entry, based on a fuzzy control algorithm.

The Multi-Objective Optimization contest was organised by Ponnuthurai Nagaratnam Suganthan and associated with a CEC 2007 special session of the same name. For this contest researchers had to submit their multi-objective optimization software for independent testing on a challenging set of benchmarks.

The 2007 IEEE CIS Student Travel Grant (CEC) award winners.

A gathering of the delegates (after the banquet).

This was jointly won by the following entries:

❏ Deepak Sharma, Abhay Kumar, Kalyanmoy Deb, Karthik Sindhya, "*Hybridization of SBX Based NSGA-II and Sequential Quadratic Programming for Solving Multi-objective Optimization Problems*".

❏ Saku Kukkonen and Jouni Lampinen, "*Performance Assessment of Generalized Differential Evolution 3 (GDE3) with a Given Set of Problems*".

The Best Student Paper Awards went to Alexandra Alecu and A. M. Salagean for their paper "*A Genetic Algorithm for Computing the k-Error Linear Complexity of Cryptographic Sequences*", as well as to Germ'an Terrazas, Marian Gheorghe, Graham Kendall, and Natalio Krasnogor for their paper "*Evolving Tiles for Automated Self-Assembly Design*", which also won the Best Overall Paper Awards for CEC 2007.

Moreover, a series of events were held as part of the social programs to allow participants to better appreciate the sights and sounds of Singapore. To start things off, on the first day of the conference, a welcome reception for all conference participants was held at the Asian Civilizations Museum, which showcases over 1300 artifacts collections on the civilizations of China, Southeast Asia, South Asia and West Asia/Islamic. A lunch gathering, together with the presentation of grant awards, where 26 student members of the IEEE Computational Intelligence Society received travel grants, was organized on the 27th of September, as was a meeting for strategizing the Future Directions in Evolutionary Computation (FDEC). On the same day, the conference dinner banquet was held. Delegates enjoyed nine courses of fine Asian cuisine, accompanied by excellent entertainment including Malaysian pole dancers (not what you're thinking!— see photos on conference website at www.cec2007.org), and a snake charmer. The next day, on the 28th, a Women in Computational Intelligence (WCI) Reception and Meeting was organized in the afternoon. The entire conference culminated on the 28th of September with a dinner and tour at the Night Safari—the world's first wildlife park built for visits at night.

At the end of it all, IEEE CEC2007 effectively brought together researchers and practitioners in the field of evolutionary computation from all around the globe. Technical exchanges within the research community throughout the conference encompassed keynote and invited speeches, special sessions, tutorials, as well as oral and poster presentations. Additionally, participants were treated to a series of social events, from formal functions to informal receptions and networking sessions, all of which served as a primary channel in establishing new connections and fostering lasting friendship between like-minded counterparts.