

Title

Multitasking and Knowledge Transfer in Evolutionary Computation

Call for Papers

In the field of computational intelligence, the sociologically inspired notion of “memes” has come to be regarded as a unit of cultural information or nugget of knowledge that resides in the brain and is the social analogue of the biological “gene”. From the perspective of scientific usage, it represents an intrinsic feature of the human mind to derive conceptual abstractions from various problem-solving experiences, storing them in the brain in the form of knowledge nuggets, and reusing/transferring them whenever needed for related tasks. It is contended that successfully replicating this phenomenon on computing platforms can propel search algorithms to higher levels of intelligence, opening doors to a plethora of exciting research opportunities and real-world/industrial applications. In this regard, a matter of significant interest is the establishment of a computational view of cognitive multitasking, wherein multiple problem-solving tasks may be managed and executed concurrently with implicit knowledge exchange among them. It is recognized that in this fast-paced, technologically driven world that we live in, the explosion in volume and variety of task complexity presents unprecedented opportunity, tendency, and even the need for effective multitasking.

The aim of this special session is to provide a forum for researchers to contribute insightful theoretical advancements, novel algorithms, and real-world applications of multitasking and knowledge transfer in evolutionary computation.

Topics of Interest

Authors are invited to submit their original and unpublished work in the areas including, but not limited to:

- Explicit knowledge extraction techniques from past problem-solving experiences
- Building block transfer across problems
- Algorithms for evolutionary multitasking across single and multi-objective optimization
- New comparison techniques for multitask optimization algorithms
- Unification schemes in evolutionary multitasking
- Mechanisms of implicit knowledge transfer in continuous and combinatorial search spaces
- Novel evolutionary operators for evolutionary multitasking
- Theoretical studies that improve our understanding of evolutionary multitasking
- Real-world applications of multitasking and knowledge transfer in EC

Organizers

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Yew-Soon Ong is Professor and Chair of the School of Computer Science and Engineering, Nanyang Technological University Singapore. He received a PhD degree on Artificial Intelligence in complex design from the Computational Engineering and Design Centre, University of Southampton, UK in 2003. His current research interest in computational intelligence spans across memetic computing, evolutionary design, machine learning and big data. He is the founding Technical Editor-in-Chief of Memetic Computing Journal, founding Chief Editor of the Springer book series on studies in Adaptation, Learning, and Optimization, Associate Editor of the IEEE Transactions on Evolutionary Computation, the IEEE Transactions on Neural Networks & Learning Systems, IEEE Computational Intelligence Magazine, IEEE Transactions on Cybernetics, Soft Computing, International Journal of System Sciences and others.

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Liang Feng received the PhD degree from the School of Computer Engineering, Nanyang Technological University, Singapore, in 2014. He was a Postdoctoral Research Fellow at the Computational Intelligence Graduate Lab, Nanyang Technological University, Singapore. He is currently an Assistant Professor at the College of Computer Science, Chongqing University, China. His research interests include Computational and Artificial Intelligence, Memetic Computing, Big Data Optimization and Learning, as well as Transfer Learning.

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Abhishek Gupta received the PhD degree in Engineering Science from the University of Auckland, New Zealand. He is currently a Research Fellow at the Rolls-Royce@NTU Corporate Lab, Nanyang Technological University, Singapore. He has diverse research interests spanning the fields of continuum mechanics as well as computational intelligence, with recent emphasis on evolutionary search methods and their application to engineering design.

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