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Preface

The papers in this volume were presented at the 10th International Conference on Algorithmic Aspects of Information and Management (AAIM 2014), held during July 8–11, 2014, at Harbour Centre, Simon Fraser University, Vancouver, Canada. It was the first time for the AAIM conference series to be held in Canada. The topics covered most areas in discrete algorithms and their applications.

Submissions to the conference were handled electronically. A total of 45 papers were submitted, of which 30 were accepted. The papers were evaluated by an international Program Committee overseen by the Program Committee co-chairs: Qianping Gu, Pavol Hell, and Boting Yang. The Program Committee consists of Hee-Kap Ahn, Binay Bhattacharya, Anthony Bonato, Zhi-zhong Chen, Leizhen Cai, Francis Chin, Chuangyin Dang, Xiaotie Deng, Ding-Zhu Du, Michael Fellows, Bin Fu, Gena Hahn, Kazuo Iwama, David Kirkpatrick, Guohui Lin, Tian Liu, Tom McCormick, Daniel Paulusma, Lorna Stewart, Xuehou Tan, Dimitrios Thilikos, Takeshi Tokuyama, Lusheng Wang, Peter Widmayer, Jinhui Xu, Yinfeng Xu, Guochuan Zhang, Kaizhong Zhang, Xiao Zhou, and Binhai Zhu. It is expected that most of the accepted papers will appear in a more complete form in scientific journals.

The submitted papers were from 16 countries/regions: Brazil, Canada, China, France, Germany, Hong Kong, India, Japan, Korea, Mexico, The Netherlands, Switzerland, Taiwan, Tunisia, UK, and USA. Each paper was evaluated by at least three Program Committee members, assisted in some cases by subreviewers. In addition to the 30 selected papers, the conference also included two invited talks, one by Ming Li on "Approximating Semantics," and the other by Christos H. Papadimitriou on "Computational Insights and the Theory of Evolution."

We thank everyone who made the meeting a success, the invited speakers, the authors, the Program Committee members and external reviewers (listed in the proceedings). Finally, we thank Simon Fraser University for their support and the local organizers and colleagues for their assistance.

April 2014

Qianping Gu
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Invited Talks

Computational Insights and the Theory of Evolution

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Covertly computational ideas have influenced the Theory of Evolution from the very start. This talk is about recent work on Evolution that was inspired and informed by computational insights. Considerations about the performance of genetic algorithms led to a novel theory of the role of sex in Evolution based on the concept of mixability, while the equations describing the evolution of a species can be reinterpreted as a repeated game between genes played through the multiplicative updates algorithm. Finally, a theorem on Boolean functions helps us understand better Waddington's genetic assimilation as well as mechanisms for the emergence of novelty in Life.

Approximating Semantics

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Latent search engines and question-answering (QA) engines fundamentally depend on our intuitive notion of semantics and semantic distance. However, such a semantic distance is likely undefinable, certainly un-computable, and often blindly approximated. Can we develop a theoretical framework for this area?

I will describe a theory, using the well-defined information distance, to approximate the elusive semantic distance such that it is mathematically proven that our approximation is "better than" any computable approximation of the intuitive concept of semantic distance. Although information distance itself is obviously also not computable, it does allow a natural approximation by compression. We will then describe a natural language encoding system to implement our theory followed by experiments on a QA system.

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