Department of Computer Science
香港城市大學
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COMPUTER SCIENCE COLLOQUIUM

Evolutionary computation for chance-constrained optimisation problems

SPEAKER **Aneta Neumann, Frank Neumann**

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DATE 2 Jul, 2025 (Wed)
TIME 10:00 AM - 12:00 PM
VENUE CS Seminar Room, Y6405, 6th Floor, Yellow Zone, Yeung Kin Man Academic Building, City University of Hong Kong, 83 Tat Chee Avenue, Kowloon Tong

ABSTRACT

Many optimisation problems involve stochastic components, and evolutionary algorithms have been successfully applied to a wide range of these problems. Chance constraints allow to limit the effect of uncertainty with respect to stochastic components in the constraints and have been widely applied in operations research. In this talk, we will discuss some recent evolutionary computation approaches for dealing with stochastic problems in the chance constrained setting where objective values or constraints are met with given guarantees. On the applications side, we discuss approaches for mine planning under uncertainty whereas on the theoretical side we present runtime analysis results for evolutionary algorithms in the context of chance constrained submodular optimisation.

BIOGRAPHY

Aneta Neumann is a researcher in the School of Computer and Mathematical Sciences at the University of Adelaide, Australia, and focuses on solving real world problems using evolutionary computation and machine learning methods. She is also a member of the Integrated Mining Consortium at the University of Adelaide. Aneta graduated in Computer Science from the Christian-Albrechts-University of Kiel, Germany, and received her PhD from the University of Adelaide, Australia. She served as the co-chair of the Real-World Applications track at GECCO 2021-2022 and was the co-chair of the Genetic Algorithms track at GECCO 2023-2024. She is a co-organiser of the Workshop on AI-based Optimisation 2025 and publicity co-chair for EMO 2025. Her main research interests are bio-inspired computation methods, with a particular focus on dynamic and stochastic multi-objective optimization for real-world problems that occur in the mining industry, green energy, defence, creative industries, and public health. Frank Neumann is a professor and the leader of the Optimisation and Logistics group at the University of Adelaide and has been an Honorary Professorial Fellow at the University of Melbourne (2019-2023). His current position is funded by the Australian Research Council through a Future Fellowship and focuses on AI-based optimisation methods for problems with stochastic constraints. Frank has been the general chair of the ACM GECCO 2016 and co-organised ACM FOGA 2013 in Adelaide. He is an Associate Editor of the journals "Evolutionary Computation" (MIT Press) and ACM Transactions on Evolutionary Learning and Optimization. In his work, he considers algorithmic approaches in particular for combinatorial and multi-objective optimization problems and focuses on theoretical aspects of evolutionary computation as well as high impact applications in the areas of cybersecurity, renewable energy, logistics, and mining.

All are welcome!

In case of questions, please contact Prof. ZHANG Qingfu at qingfu.zhang@cityu.edu.hk, or visit the CS Departmental Seminar Web at https://www.cs.cityu.edu.hk/events/cs-seminars/recent-cs-colloquiums.