

Semialgebraic parametric analysis by metaprogramming and applications in optimization

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Talk will take place in Martin M-104, from 11:15am - 12:05pm

Abstract: We develop a metaprogramming technique that transforms algebraic programs for testing a property for a given input parameter into programs that compute the parameter region (proof-cell) of the input for which the property holds. The obtained proof-cells are semialgebraic sets. We borrow techniques from global optimization for the simplification and representation of proof-cells, and we investigate strategies that lead to shorter proofs. We discuss a few applications of the SPAM technique to portfolio optimization, solving multi-parametric mixed-integer programs and automated proofs of cutting plane theorems.

Bio: Yuan Zhou is an assistant professor in the Department of Mathematics at the University of Kentucky. She obtained her diplôme d'ingénieur from École Centrale Paris and a master's degree from Université Paris-Dauphine in 2012 with a focus on Financial Mathematics. She received her Ph.D. in Applied Mathematics in 2017 from University of California, Davis under the supervision of Matthias Köppe. Her research expertise lies in the theory for mixed integer linear optimization, in particular modern cutting plane theory.