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ANTHONY KARAHALIOS
Ph.D. student
Carnegie Mellon University, USA

COLUMN ELIMINATION

Abstract: Column elimination is an exact algorithm to solve discrete optimization problems via a 'column' formulation in which variables represent a combinatorial structure such as a machine schedule or truck route. Column elimination works with a relaxed set of columns, from which infeasible ones are iteratively eliminated. As the total number of columns can typically be exponentially large, we use relaxed decision diagrams to compactly represent and manipulate the set of columns. In this talk, we provide an introduction to the column elimination method and present recent algorithmic improvements resulting in competitive performance on large-scale vehicle routing problems. Specifically, our approach closes a large vehicle routing benchmark instance with 1,000 locations for the first time.

Short Biography: Anthony Karahalios is a Ph.D. student in the Algorithms, Combinatorics, and Optimization program at Carnegie Mellon University. He hopes to graduate in Spring 2025. He is advised by the brilliant Willem-Jan van Hoeve. His research focuses on novel models and methods for solving real-world discrete optimization problems. Before his graduate studies, he worked for three years as a quantitative developer for Marshall Wace Asset Management. Before that, he received his B.S. in Applied Mathematics and Statistics from Johns Hopkins University.

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Responsable :
Jean-François Côté