CIRRELT

Séminaire conjoint avec / Joint Seminar with

Chaire de recherche SCALE AI sur les chaînes d'approvisionnement pilotées par les données / SCALE-AI Chair in Data-Driven Supply Chains

SCALE AI

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Combinatorial optimization augmented machine learning: foundations, operations research applications, and perspectives

Abstract: Combinatorial optimization augmented machine learning (COAML) is a novel and rapidly growing field that integrates methods from machine learning and operations research to tackle data-driven problems that involve both uncertainty and combinatorics. These problems arise frequently in industrial processes, where firms seek to leverage large and noisy data sets to better optimize their operations. COAML typically involves embedding combinatorial optimization layers into neural networks and training them with decision-aware learning techniques. This talk provides an overview of the field, covering its main applications, algorithms, and theoretical foundations. We also demonstrate the effectiveness of COAML on contextual and dynamic stochastic optimization problems, as evidenced by its winning performance on the 2022 EURO-NeurIPS challenge on dynamic vehicle routing.

Bio : Axel Parmentier is a researcher and associate professor at École des Ponts since 2016, where he founded and holds the Artificial Intelligence for Air Transport chair with Air France. His research focuses on the intersection of operations research and machine learning, developing theoretical results and efficient algorithms for data-driven combinatorial optimization problems. He has a strong interest in industrial applications, particularly in air transportation, supply chain, and predictive maintenance. Axel Parmentier has been recognized for his contributions with awards such as the AMIES dissertation award in 2017 and the Robert Faure prize from ROADEF, and he leads the data, machine learning, and optimization axis of the French Operations Research group.

Jeudi / Thursday

18 juillet 2024, 10 h 30
July 18th 2024, 10:30

Pavillon André-Aisenstadt
Salle / Room 5441

Ouvert à tous / Open to all

Responsable / Organizer

Thibaut Vidal

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