

Special Session 1

Special Session Basic Information:

Session Title	Routing Problems: Optimization, Machine Learning, and AI Approaches
Introduction and topics	
Typical routing problems, such as the Vehicle Routing Problem (VRP) and Traveling Salesperson Problem (TSP), are combinatorial optimization problems that aim to minimize travel time or distance. This session covers a broad range of routing problems, including classical VRP variants as well as routing problems with profits, where the objective is to maximize the profit collected from visited customers or locations. These problems involve decisions on customer selection, vehicle assignment, and route sequencing. The session aims to bring together researchers working on recent solution approaches for routing and transportation optimization, including exact methods, heuristics, metaheuristics, matheuristics, machine learning, and AI-based approaches. Particular interest is given to hybrid methods that integrate machine learning with mathematical optimization and heuristic search. Topics covered • Vehicle Routing Problems and their variants • Routing Problems with Profits and Orienteering Problems • Exact, heuristic, metaheuristic, and matheuristic approaches • Machine learning and AI for routing optimization • Reinforcement learning and learning-based routing • ML-assisted heuristics, algorithm selection, and parameter tuning • Hybrid ML–optimization approaches • Dynamic, stochastic, and multi-objective routing • Real-world routing and transportation applications	

Special Session Chair(s):

	Name	Aldy Gunawan
	Prefix	Assoc. Prof.
	Department	School of Computing and Information Systems
	Organization	Singapore Management University

Organizer's Brief Biography

Aldy Gunawan is currently an Associate Professor of Computer Science (Practice Track) at the School of Computing and Information Systems, Singapore Management University. He received his Ph.D. in Industrial and Systems Engineering from the National University of Singapore in 2009. His main research interests include operations research, machine learning, algorithm design, and data analytics, with a focus on metaheuristics, algorithm configuration, design of experiments, combinatorial optimization, and automated planning and scheduling. His work has been published in leading conferences and top operations research journals, including the European Journal of Operational Research, Transportation Research Part E: Logistics and Transportation Review, Annals of Operations Research, Applied Soft Computing, among others. He is currently serving as Vice President of the Operational Research Society of Singapore.