

**Proposal for an invited session on „Extremal Routing Problems: Models, Algorithms, Bounds, and Industrial Applications“
for IFAC MIM 2019**

Invited session identification code **42cue**

Session co-chairs

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This special session is concerned with algorithmic analysis of discrete and continuous optimization problems originated from real-life practical applications in operation research, production, and logistics, where the main goal is to construct a collection of feasible routes satisfying to specific constraints of different kinds and minimizing the total transportation cost. Mathematically, all these problems are generalizations of the classic Traveling Salesman Problem (TSP) or Vehicle Routing Problem (VRP). As a rule, all of them are intractable in general case but admit efficient (polynomial time) approximation algorithms in special settings.

In this session, we plan to discuss

- novel mathematical models coming from industrial or economical applications, e.g. the tool path problem for the CNC sheet metal cutting machines, power plant unit dismantling problems, etc.
- novel approaches to construction efficient algorithms for these problems and evaluating their performance both theoretically and by numerical benchmarking.

Main session topics include, but not limited to

Theoretical and numerical analysis of combinatorial optimization problems generalizing TSP and VRP, e.g. the Generalized Traveling Salesman Problem, Asymmetric TSP, Capacitated VRP with additional constraints: heterogeneous and dynamic demand, hard and soft time windows, etc. including

- novel mathematical models in terms of integer or mixed optimization
- polynomial time approximation algorithms with theoretical performance bounds and approximation schemes
- efficient approximation thresholds
- polynomial time solvable subclasses and exact algorithms, including special schemes of dynamic programming
- randomized algorithms
- heuristics and metaheuristics
- numerical algorithm analysis and benchmarking
- computational intelligence and evolutionary algorithms
- real-life routing problem settings stemming from industry, production, and logistics
- novel mathematical models and algorithms of the tool path problem for the CNC sheet metal cutting machines
- routing with dynamic constraints

Submission

Authors interested in submitting their research, refer to www.ifac.control.org. All papers should be two column format as per IFAC manuscript style. The full length draft paper must be submitted by December 15, 2018. All submitted papers will be peer reviewed by IPC members. The corresponding author submits the paper online as an invited paper session with code **42cue**.

Important dates

Deadline for submission	December 15, 2018
Notification of acceptance/rejection	February 20, 2019
Deadline for final submission	March 15, 2019