

CCE_4

Title of the doctoral program

Computer and Control Engineering

Title of the research activity

Simulation and optimization tools for intermodal freight transportation in Smart City and City Logistics.

Short description of the research activity

This research proposal arises in the domain of Smart Cities and City Logistics. In particular, we focus on the optimization of transportation operations characterized by two distinctive factors: the presence of multiple transportation modes and the presence of a strong uncertainty on some data.

In particular, we will focus on different realistic freight transportation scenarios, including:

- Parcel delivery;
- 3PL contracts management and long term capacity allocation for periodic deliveries;
- Real-time vehicle route optimization under strong variance of travel times.

The objectives of this research project are:

- Control the delivery process when multiple transportation modes are available;
- Measure and evaluate the effect of the introduction of environmental policies and green aspects on the dispatching operations in Smart Cities;
- Incorporate the uncertainty of the data in the solution process in order to control the effects of the uncertainty.

The tools and the methodology used in this project are typical of Operations Research and Computer Science. In details, the student will develop Linear Programming Models to represent the problems under study and exact/heuristic methods for solving them.

The modeling part is accomplished by means of state-of-the-art commercial solvers available in the Department (Cplex, Xpress, Gurobi), while the exact and heuristic methods are normally coded in C++/Java.

Scientific responsible (name, surname, role, email)

Guido Perboli, Assistant professor, guido.perboli@polito.it

Number of vacancies for XXXI cycle (3 years program)

1

Specific requirements (experiences, skills)

C++/Java programming, Heuristic and Metaheuristic development

Website of the research group (if any)

http://www.dauin.polito.it/research/research_groups/oro_operations_research_and_optimization_group