

**Call for application for research scholarships
for post-graduate international candidates**

RESEARCH PROJECT N. 3

Title Bilevel stochastic optimization problems for Urban Mobility and City Logistics
Scientific responsible (name, surname, role) Guido Perboli, Associate Professor, Director of the ICT for City Logistics and Enterprises Lab (guido.perboli@polito.it)
Short description of the research activity (max 250 words) The proposal considers the problem of pricing of services in different application settings, including road network and logistics operations. When dealing with real urban logistics applications, the aforementioned problems becomes large and normally affected by uncertainty in some parameters (e.g., transportation costs, congestion, strong competition, etc.). Under this context, one of the most suitable approach is modeling the problem as a bilevel optimization problem. Indeed, bilevel programs are well suited to model hierarchical decision-making processes where a decision maker (leader) explicitly integrates some reaction of another one (follower) into its decision making process. This representation permits to explicitly represent the strategic behaviour of users/consumers into the pricing problem. Unfortunately, solving large-sized bilevel optimization problems with integral variables or affected by uncertainty is still a challenge in the literature. This Research Proposal aims to fulfil this gap, deriving new exact and heuristic methods for integral and stochastic bilevel programs.
Specific requirements (experiences, skills) The ideal candidate has a strong background in mathematics/statistics and a good knowledge of combinatorial optimization and mathematical programming tools (cplex, gurobi, Xpress) Good programming skills in Java or Python
Website of the research group (if any) icelab.polito.it
Keywords (min 3, max 6) Blockchain, Sustainable logistics
Research Area (max 1)

- Mathematics