Henri Lefebvre

Born: 23/06/1996
City: Bologna, 40141 (It)
Driving license

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Research interests

Robust optimization • Decomposition methods • Convex optimization • Exact methods

Education

2019-2022* **Ph.D. in Applied Mathematics - Optimization (Dottorato)**
University of Bologna (It)
Tutors: Michele Monaci, Enrico Malaguti
*Selected by the "Mixed-Integer Non Linear Optimisation: Algorithms and Application" (*MINOA*) consortium*
Funding from the European Union's EU Framework Programme for Research *and* Innovation Horizon 2020 *under the* Marie Skłodowska-Curie Actions Grant *Agreement No 764759.*

2018-2019 **Master degree in Computer Systems Engineering (Laurea Magistrale)**
University of Genova (It) / Obtained on the 29/07/2019
Final grade: 110/110 cum laude
Major in Production Systems

2018-2019 **Master degree in Complex System Engineering (Laurea Magistrale)**
University of Technology of Compiègne (Fr) / Obtained on the 04/10/2019
Major in Optimization and Learning of Systems
Joint diploma

2014-2019 **Engineer's degree in Computer Science (Laurea Magistrale)**
University of Technology of Compiègne (Fr) / Obtained on the 18/10/2019
Major in Decision support in logistics
Minor in Philosophy, Technology and Cognition

2016 **Study semester in Shanghai (6 months)**
University of Shanghai - UTSEUS faculty (Cn)

* *Indicates expected*

Submitted papers

2020 F Clautiaux, B Detienne, H Lefebvre**, A two-stage robust approach for minimizing the weighted number of tardy jobs with objective uncertainty**
Under review at *Journal of scheduling*

2021 H Lefebvre, B Detienne, E Malaguti, M Monaci**, Adaptive robust optimization with objective uncertainty**
Submitted

2021 H Lefebvre, E Malaguti, M Monaci**, Adjustable robust optimization with discrete uncertainty**
Submitted

Presentations in conferences

2022 H Lefebvre, E Malaguti, M Monaci**, Reformulation for a two-stage robust facility location problem**
23rd Conference of the French OR society (ROADEF), Lyon

2021 H Lefebvre, B Detienne, E Malaguti, M Monaci**, Two-stage robust optimization with objective uncertainty**
Workshop on robust and stochastic optimization methods

2021 H Lefebvre, B Detienne, E Malaguti, M Monaci**, A finite ε-convergence algorithm for 0-1 mixed-integer convex two-stage robust optimization with objective uncertainty**
50th International Conference on Optimization and Decision Science (ODS), Roma

2021 H Lefebvre, B Detienne, E Malaguti, M Monaci**, A finite ε-convergence algorithm for 0-1 mixed-integer convex two-stage robust optimization with objective uncertainty**
31st European Conference on Operational Research (EURO), virtual

2021 H Lefebvre, B Detienne, E Malaguti, M Monaci**, A finite ε-convergence algorithm for 0-1 mixed-integer convex two-stage robust optimization with objective uncertainty**
22nd Conference of the French OR society (ROADEF), virtual

2021 H Lefebvre, B Detienne, E Malaguti, M Monaci**, A finite ε-convergence algorithm for 0-1 mixed-integer convex two-stage robust optimization with objective uncertainty**
Workshop on Polyhedra and Combinatorial Optimization (JPOC), virtual

2021 F Clautiaux, B Detienne, H Lefebvre**, A two-stage robust approach for minimizing the weighted number of tardy jobs with profit uncertainty**
17th International Workshop on Project Management and Scheduling (PMS), virtual

2020 F Clautiaux, B Detienne, H Lefebvre**, A two-stage robust approach for minimizing the weighted number of tardy jobs with profit uncertainty**
21st Conference of the French OR society (ROADEF), Montpellier

Awards and recognition

2020 **Best master thesis award**

By the French OR society (ROADEF) Obtained on the 20/02/2020
For my thesis entitled "Two-stage robust optimization applied to scheduling" featuring decomposition approaches for robust scheduling with integer recourse

Professional experience

2020 **Intern - Robust approaches for hydropower maintenance**

École Polytechnique Paris (Fr)
Supervised by Claudia D'Ambrosio *(CNRS research director and Professor)*
Development of models and algorithmic solution schemes for maintenance scheduling with a worst-case approach
Linear/convex approximation of non-linear functions using real-world data

2019 **Intern - Integer recourses in two-stage robust scheduling**

University of Bordeaux (Fr) - INRIA Bordeaux
Robust $1|r_j|\sum w_j U_j$ *with integer recourses*
Branch-and-Price algorithmic solution with Dantzig-Wolfe reformulation
Comparison with the K*-adaptability approach*

2018 **Backend developer for a Financial application on AWS**

Wide Asset Management - Paris (Fr)
Creation of ISMO-app's backend comprising e-signature of SEPA agreements and automatic investment engine

Supervision

2020 **Internship on Benders Decomposition Implementation (4 months)**

First-year of Master internship by Charlotte Mangin (University of Rennes I)
Her work, Implementing a generic Benders Decomposition for optimization under uncertainty*, was awarded with a mark of 18/20*

Projects

2021-current **Creator and developer of the state_opt_cpp C++ library**

Highly modular implementation of standard optimization algorithms and decomposition techniques using a state machine approach
Developped in C++ using Mosek solver as sub-routine

2018 **Vehicle Routing Problem Heuristic (4 months)**

University of Genova (It)
Electric Vehicle Routing Problem with budgeted charging stations and time windows for delivery
Simulated Annealing and Variable Neighbourhood Search

2018 **Multimodal Shortest Path Egine with real-world dataset (5 months)**

Heudiasyc laboratory - Compiègne (Fr)
Dijkstra Algorithm with time dependencies
Google Transit Format Specification (GTFS) dataset for graph generation

2017 **Artifical Intelligence for a strategic game (3 months)**

University of Technology of Compiègne (Fr)
Autonomous player for the Arimaa game
Logic programming based AI

Community involvements

2021 **Co-organizer of the ESR Days 2.0 online workshop**

Online workshop (March 4-5th) *with the participation of seven speakers including Antonio Frangioni (UNIPD), Utz-Uwe Haus (HPC) and Didier Henrion (LAAS-CNRS)*
Co-arganized alongside with Chaitanya Gudapati (UNIBO) and Martina Cerulli (École Polytechnique)

2020 **Promoter of Bologna's OR team seminar**

First speaker and organizer of the first session of Bologna's OR team seminar
The project has been (temporarily) suspended because of COVID-19, yet it received postive enthousiasm from Ph.D. students as well as permanent members of the OR team

Scientific and technical knowledge

Languages	English (fluent), Italian (intermediate), French (mother tongue)
Certification	TOEIC 965/990 (11/05/2018)
Coding	C++17, Modern CMake, git, IBM CPLEX, Mosek solver, LaTeX, ssh, Linux
Mathematics	Convex MINLP, Dantzig-Wolfe and Benders decomposition, Fenchel duality, Polyhedral analysis, Combinatorial optimization, Conic programming

Attended scientific events*

2021 **2nd Summer School of the MINOA project**

Virtual attendance
The school covered "Nonlinear Optimal Control Problems: Methods and Applications" as well as "Conic Optimization and Applications"

2020 **9th Winter School on Network Optimization**

Estoril (Pt)
In particular,
- Arie Koster (RWTH Aachen University) - Robust Network Optimization
- Ivana Ljubic (ESSEC Business School of Paris) - Branch-and-Benders-cut algorithms: modern implementations of Benders Decomposition

2020 **24th Aussois Combinatorial Optimization Workshop**

CNRS Centre Paul Langevin, Aussois (Fr)
In particular:
- Laurence Wolsey (École Polytechnique of Louvain) Benders Algorithm with Integer Subproblems

* *In addition to those in which a talk was presented*

References

- François Clautiaux, Master thesis supervisor and collaborator
  President of the French OR society (ROADEF)
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- Boris Detienne, Master thesis supervisor and collaborator
  INRIA/IMB, University of Bordeaux • (+33) 5 40 00 21 43 • boris.detienne@u-bordeaux.fr
- Dritan Nace, Responsible of the "Engineering of Complex Systems" Master of the University of Technology of Compiègne
  Heudiasyc Laboratory • (+33) 3 44 23 43 02 • nace@utc.fr