Mira BOU SALEH

PhD in Computer Science
Operations Research & Optimization Specialist
MEng. in Telecommunications & Informatics

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Professional and Research Experience

Oct 2024 – present
Lecturer and Academic Coordinator for the MIASHS Year 1, *IDMC, University of Lorraine, Nancy, France.*
- Teaching courses for undergraduate MIASHS students and Master's MIAGE students.
- Preparing lectures and exams for three course units.
- Grading written exams and supervising student projects.
- Project leader for a group of Master 2 MIAGE students.
- Member of the jury for 3rd Year MIAGE internship defenses.
- Academic Coordinator for the MIASHS Year 1 :
  - Advising, and supporting students throughout their academic journey.
  - Monitoring and assessing students' academic performance.
  - Organizing exams and managing deliberation boards.
  - Planning and coordinating timetables.

Oct 2023 – Aug 2024
Lecturer and Researcher Assistant (ATER), *LORIA/OPTIMIST Laboratory, IDMC, University of Lorraine UL, Nancy, France.*
- Taught courses for MIASHS undergraduate students.
- Evaluated written exams and supervised student projects.
- Tutor for L3 MIAGE internship.

Sep 2022 – Aug 2023
Lecturer and Researcher Assistant (ATER), *NIT-O2S Laboratory, UBFC, UTBM, Belfort, France.*
- Taught courses for Computer Science and Industrial Systems engineering students.
- Evaluated practical work, prepared exams, and supervised student projects.
- Member of the jury for internship and project defenses.

Sep 2020 – Dec 2023
Research Assistant, Ph.D. Student, *NIT-O2S Laboratory, UBFC, UTBM, Belfort, France.*
- Developed **multi-objective approaches**: a linear aggregation method and a constraint-based mathematical model to solve **resource allocation and planning problems in specialized education services**.
- **Solved assignment, planning, and routing problems for employees in the network of specialized education and home care services** using exact methods (**Mixed-Integer Linear Programming**), heuristics (**Greedy**), and meta-heuristics (**Genetic Algorithm**, **Discrete Invasive Weed Optimization**).
- Developed an optimization tool for **task assignment** and **route planning** for **specialized education and home care services.**
- Published four articles, one submitted and one in preparation.
- Taught courses for Computer Science and Industrial Systems engineering students (228 HeTD).
- Evaluated practical work, prepared exams, and supervised student projects.
- Member of the jury for internship and project defenses.

Mar – Aug 2020
Back-End Java / JavaEE Developer, *UTBM, Belfort, France.*
- Development of different functionalities.
- Ensuring the smooth running of the operation.
- Carrying out unit tests.
- Improved user experience (UX) / user interface (UI).

Mar 2019 – Feb 2020
Research Assistant, *TICKET Laboratory, Antonine University, Hadat-Baabda, Lebanon.*
- **Developed Antenna Optimizer System (AOS)** for optimizing **antenna dimensions**.
- Implemented IWO-based optimization and proposed cost functions.
- Validated tool with multi-band dipole antenna design, compared results with CST simulation optimizer.
- Published findings in two international conference articles

May – Aug 2019
Training Internship: CubeSat, *National Council for Scientific Research CNRS-Lebanon, Beirut-Mansourieh, Lebanon.*
- Practical teaching of technical skills on operating base stations capable of tracking nanosatellites in Earth orbit.
- Teaching skills in mission analysis and CubeSat/Nanosatellite technology design.

Jun – Aug 2017
Internship: Mobile Network Optimization, *Alfa Telecommunications, Dekwaneh, Lebanon.*
- Analyzed the operation of GSM, UMTS, and LTE mobile network cells.
- Visualized and interpreted the degradation of key performance indicators (KPIs).
- Added missing neighboring cells to existing cells.
- Conducted field tests (Drive Tests).

Education

2023   **Ph.D. in Computer Science, Doctoral School SPIM, University of Burgundy Franche-Comté UBFC, UTBM**, *France*.
Generalized Resource Assignment and Planning Optimization in Specialized Education and Home Care Services.

2019   **Master in Engineering in Informatics and Telecommunications**, *Faculty of Engineering, Antonine University*, Hadat-Baabda, Lebanon.

Projects

March 2025 – present   **Hyperparameter Optimization for Machine Learning**.
My work on this project focuses on optimizing the hyperparameters of a Graph Neural Network (GNN) using Genetic Algorithms (GA) to enhance model performance and robustness. The process included tuning key parameters (layer sizes, learning rates, regularization, etc.), implementing an evolutionary approach with tournament selection, crossover (arithmetic, uniform), and adaptive mutations.

September 2020 – December 2023   **Generalized Resource Assignment and Planning Optimization in Specialized Education and Home Care Services**, *University of Technology of Belfort-Montbéliard*.
This project, conducted at the NIT-O2S lab of UTBM under the supervision of Dr. Amir HAJJAM EL HASSANI and Dr. Olivier GRUNDER, focused on optimizing resource assignment and planning in specialized education and home care services in France. It addressed three challenges: multi-day assignment (SES-MAP), optimization including travel considerations (SEHCS-MAPTP), and multi-center management at the departmental level. For SES-MAP, a multi-objective MILP model maximized student satisfaction and balanced workload. For SEHCS-MAPTP, MILP models and metaheuristics optimized assignment and planning, incorporating travel and distance. Multi-center management combined hierarchical mission allocation and internal center planning. This work produced four papers, including two in scientific journals, and was presented at one national and two international conferences.

March 2019 – February 2020   **A Novel Software Tool for Antenna Design**, *Antonine University*.
In this project, I developed an Antenna Optimizer System (AOS), a software tool that optimizes antenna dimensions to meet frequency and bandwidth specifications. AOS operates in three phases: initialization (preparation), optimization (IWO algorithm and cost functions), and finalization (results validation). Tested on a multi-band dipole antenna, AOS demonstrated speed and efficiency compared to CST's optimizer (genetic algorithm), with two papers published in an international conference.

May – October 2018   **Platform to Promote and Optimize Access to Shared Taxis in Lebanon**, *Antonine University*.
This project involved a platform to improve the relationship between passengers and public transport, especially Lebanese public taxis known as "service". My role was to develop the back-end of the platform, which provides passengers with route options between their departure point and destination, including meeting points with different drivers in their area matching their preferences. Two papers were published.

Publications

2024   Mira Bou Saleh, Abderrahim Chariete, Leo Schwartz, Olivier Grunder, and Amir Hajjam El Hassani. Reactive tabu search and mixed-integer linear programming for multi-day assignment, scheduling, and routing problems of specialised education and home-care services. *International Journal of Production Research*, volume 63, pages 1779–1802. Taylor & Francis, 2024.

2023   Mira BOU SALEH, Olivier GRUNDER, and Amir HAJJAM EL HASSANI. Discrete invasive weed optimization and greedy hybridization algorithm for home care multi-days assignment scheduling and routing problems. In *2023 9th International Conference on Control, Decision and Information Technologies (CoDIT)*, pages 638–643. IEEE, 2023.

2022   Rony DARAZI, Elie M. CHOUEIRI, Mira BOU SALEH, Elias DOUMITH, Anthony TANNOURY, Abderrahim SEKKAKI, and Amir HAJJAM EL HASSANI. A platform management system that links commuters with shared or service taxis. *World Safety Journal*, volume XXXI, pages 63–76, 2022.

2022   Rony DARAZI, Elie M. CHOUEIRI, Mira BOU SALEH, Elias DOUMITH, Anthony TANNOURY, Abderrahim SEKKAKI, and Amir HAJJAM EL HASSANI. Pct: A platform that promotes and improves collective taxi access. *Advances in Transportation Studies*, volume 57, pages 71–84, 2022.

2022   Mira BOU SALEH, Olivier GRUNDER, and Amir HAJJAM EL HASSANI. Mixed-integer linear programming for specialized education and home care services. *IFAC-PapersOnLine*, volume 55, pages 3130–3135, 2022.

2021   Mira BOU SALEH, Olivier GRUNDER, and Amir HAJJAM EL HASSANI. Optimisation de la planification du personnel dans les services d'Éducation spécialisées et de soins À domicile. In *22ème Conférence ROADEF de la Société Française de Recherche Opérationnelle et d'Aide à la Décision*. ROADEF, 2021.

2020   Mira BOU SALEH, Elias A. DOUMITH, and Rémi SARKIS. Invasive weed optimization for antenna design: Case of 4g/5g multi-band antenna. In *2020 IEEE International Symposium on Antennas and Propagation and North American Radio Science Meeting*, pages 2071–2072. IEEE, 2020.

2020   Eliana BARAMILI, Remi SARKIS, and Mira BOU SALEH. Investigation of driver emf exposure from 4g/5g automotive glass mounted antennas. In *2020 IEEE International Symposium on Antennas and Propagation and North American Radio Science Meeting*, pages 1451–1452. IEEE, 2020.

Teaching Experience

Institute of Digital Sciences, Management and Cognition (IDMC)

MIASHS Bachelor's Degree.
- **Computer Architecture**, *Spring 2025*, Lecture (10h) and Tutorial (5×15h), French.
- **Python Programming**, *Spring 2025*, Lecture (15h), French.
- **Advanced Databases**, *Spring 2025*, Tutorial (14h), French.
- **Advanced Algorithms**, *Spring 2025*, Tutorial (14h), French.
- **Advanced Object-Oriented Programming**, *Autumn 2024*, Tutorial (26h), French.
- **Advanced Web Development**, *Spring 2024*, Tutorial (48h), French.
- **Algorithms - Programming 3**, *Spring 2024*, Tutorial (52h), French.
- **Advanced Algorithms**, *Autumn 2024*, Tutorial (60h), French.
- **Internship Supervision, L3 MIAGE**, *Spring 2024*, 5 students.
- **Internship Defense Jury Member**, *Spring 2024*, 10 defenses, L3 MIAGE.

MIAGE Master's Degree.
- **Business Intelligence**, *Spring 2025*, Lecture (25h) and Tutorial (2×20h), French.
- **Final Year Project**, *2024–2025*, group of 3 students.

University of Technology of Belfort-Montbéliard (UTBM)

FISE Computer Science and FISA Computer Science.
- **IT45: Optimization and Operations Research**, *Spring 2022–2023*, Lab (36h), French.
- **PR73: Human-Computer Interaction**, *Spring 2022–2023*, Lab (18h), French.
- **AP4B: OOP − UML Modeling and Practice with Java**, *Spring 2023*, Lab (9h), English.
- **LP25: Linux Operating System and C Programming**, *Autumn 2022*, Tutorial (22h) and Lab (18h), French.
- **SV51: Cloud Infrastructure and Virtualization**, *Autumn 2022*, Lecture (4h), Tutorial (14h), and Lab (6h), English.
- **SV52: System and Network Administration**, *Autumn 2022*, Lecture (20h), Tutorial (20h), and Lab (24h), French.
- **Internship Defense Jury Member**, *Spring 2022–2023*, 3 defenses, 1st and 3rd cycle engineering.

FISE Industrial Systems and FISA Industrial Logistics.
- **OL50: Optimization Methods**, *Spring 2023*, Lab (18h), French.
- **GP74: Optimization**, *Autumn 2022*, Lab (30h), French.

Professional and Personal Skills

Optimization and Operations Research
Combinatorial optimization, Linear and nonlinear programming, Mixed-Integer Linear Programming (MILP), Multi-objective optimization, Assignment problems, Scheduling problems, Routing problems, Exact methods, Heuristics, Metaheuristics (Genetic Algorithms, Invasive Weed Optimization), Applications in logistics and artificial intelligence. **Tools**: Gurobi, GLPK, Irace.

BI and Data Analysis
Business Intelligence (BI), Data warehousing, Multidimensional modeling, ETL (Extract, Transform, Load), Dashboards, Data visualization, Predictive analytics, KPI management, Data-driven optimization and decision-making. **Tools**: Power BI, Tableau, QlikView.

Programming and Development
Python, Java, C/C++, Matlab, GMPL, PL/SQL, LaTeX, Object-Oriented Programming (OOP), UML modeling, Advanced algorithm design and development, Web development and user interfaces, Database management (PostgreSQL, MySQL, Oracle Database, MySQL Workbench). **Environments and Tools**: Jupyter Notebook, Google Colab, VS Code, NetBeans, Eclipse.

Systems and Networks
Linux, Windows, System and network administration, Virtualization, Cloud computing, Network infrastructure, GSM, UMTS, LTE, 5G, KPI monitoring, Network performance optimization.

Soft Skills
Decision-making, Critical thinking, Complex problem-solving, Project management, Autonomy, Adaptability, Teamwork, Student supervision (academic support, project mentoring, internship tutoring), Foreign languages, Scientific communication, Article writing, Conference presentations, Ability to work under pressure, Managing multiple responsibilities simultaneously.

Languages

English Fluent   **French** Bilingual   **Arabic** Native   **Spanish** Beginner

Activities and Interests

- I hold the French national qualification (CNU) for university teaching and research in Section 27 (Computer Science) and Section 61 (Computer Engineering, Automation, and Signal Processing).
- Reviewed articles for journals and conferences (IJPR, ISC'2021, IFAC-MIM'2022).
- Traveling and discovering new places: visited over ten countries.

References

Available upon request.