

MIT xPRO Architecture and Systems Engineering
Massachusetts Institute of Technology (MIT)

Ph.D. in Computer Science
Claude Bernard Lyon 1 University

Master Mobility and Electric Vehicles
Arts et Métiers, ENSTA, Mines Paris, École des Ponts - ParisTech

Electrical and Control Systems Engineering
National Polytechnic School of Algiers

Dr. Zine El Abidine Kherroubi

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Citizenship : French - UAE Golden Visa - EB-2 NIW (pending)

Google Scholar : <https://scholar.google.com/citations?user=g1LB01EAAAAJ&hl=en>

Website : <https://zinekherroubi.com>

Research and Expertise Areas :

- Artificial Intelligence (AI), Generative AI, Agentic AI, and Large Language Models (LLMs).
 - Autonomous Systems, particularly Autonomous and Connected Vehicles (CAVs).
 - Vehicular Networks (V2X).
 - Intelligent Transportation Systems (ITS).
 - Smart Road Infrastructure.
 - Smart Sensing.
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Education :

- **MIT xPRO** Massachusetts Institute of Technology (MIT, USA).
Architecture and Systems Engineering : Models and Methods to Manage Complex Systems.
April 2023 - August 2023.
 - **Ph.D.** Claude Bernard Lyon 1 University - Renault Group (Technocentre, France).
Ph.D. in Computer Science.
September 2017 - December 2020.
 - **M.S.** Arts et Métiers, ENSTA, Mines Paris, École des Ponts - ParisTech (France).
Master Mobility and Electric Vehicles.
September 2015 - December 2016.
 - **Eng.** National Polytechnic School of Algiers.
Automatic Control Systems, Electrical and Computer Science Engineering (**Valedictorian**).
September 2010 - June 2015.
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Software Skills :

- Artificial Intelligence and Machine Learning : Python, PyTorch, Tensorflow, Transformers, R, SageMaker.
- Programming : C/C++, Python, Matlab/Simulink, Qt.
- Embedded systems : Embedded C, Arduino, STM32.
- CAO : SolidWorks, Proteus.

Professional Experience :

- **AI & Telecommunication Researcher at *Technology Innovation Institute, TII (Abu Dhabi, UAE)* (4 years and 8 months) :**
 - **Project : “*GZMS - Securing Mesh Networks using Large Language Models*”**
 - Conducted research and development on the use of LLMs and Agentic AI for secure, autonomous, and intelligent mesh network management.
 - Developed LLM-based agents for network analysis, routing recommendation, and decision-making from network observations and performance statistics.
 - Developed code for fine-tuning, reinforcement learning (RL)-based alignment, and deployment of LLMs.
 - Managed and deployed training workflows using Amazon SageMaker.
 - Demonstration at Ai Everything Global 2025.
 - One conference paper (EWSN 2024) : <https://www.ewsn.org/file-repository/ewsn2024/ewsn2024posters-final18.pdf>
 - **Project : “*AUTODRAITEC - Infrastructure-based autonomous driving using AI and Telecommunication technologies*”**
 - Conducted research and development.
 - Presentation at GITEC 2022.
 - Demonstration & exhibition at Intelligent Vehicles Symposium IV 2024 (June 2024) : <https://ieee-iv.org/2024/exhibitions-demonstrations/>; <https://www.youtube.com/watch?v=rq4seJzfxaA>.
 - Demonstration at IJCAI 2024 (August 2024).
 - Two filed patents : *US Patent Applications No. US18/987,394 and No. US63/739,276*.
 - Four conference papers : *ITSC 2025, VTC2025-Fall, IV 2024, IJCAI 2024 (A*)*.
 - Two journal papers : *IEEE Transactions on Intelligent Transportation Systems, IET Intelligent Transport Systems*.
 - **Project : “*NOOR - The world’s largest Arabic natural language processing model*”**
 - Software development for Web scrapping (data collection).
 - **ITU AI/ML in 5G Challenge 2022 : “*Multi Modal Beam Prediction Challenge 2022 - Towards Generalization*”**
 - Second prize.
 - One journal paper : <https://arxiv.org/abs/2309.11811>.
- **R&D engineer at *Renault Group (Paris, France)* (4 years) :**
 - Preparing an industrial Ph.D. on how to use road-infrastructure to support the decision-making for connected and autonomous vehicles using *Artificial Intelligence* and *Machine Learning* techniques.
 - Jointly conducted between Renault Group (Connectivity and Multimedia department, Technocentre, Paris, France) and Claud Bernard Lyon 1 University (Lyon, France).
 - Development of a new architecture to support the decision-making of connected and autonomous vehicles based on the road infrastructure, using the traffic simulator **SUMO**, **Python**, and **PyTorch**.
 - Publication of 5 international conference papers and 1 journal paper.
- **R&D engineer at *Akka Technologies (Paris, France)* (6 months) :**
 - Preparation of the state of the art for the “*usual path autopilot*” project within a research team.
 - Development of software “*GREEN*” for energy management in electric vehicles using **Python**, within a development team.
- **R&D internship at *Renault Group (Paris, France)* (6 months) :**
 - Design of an electric and hybrid powertrain torque sensor.
 - Simulation of an electric and hybrid powertrain under **Matlab/Simulink**.
- **Project graduation (*Algiers, Algeria*) (5 months) :**
 - Preparing final-year graduation project : “*Implementation of two and three levels SVM using the Arduino Due board*”.

- Jointly conducted between the National Polytechnic School of Algiers and the Center for the Development of Advanced Technologies (CDTA), Algeria.
 - Awarded an “*Excellent*” distinction.
 - Simulation of space vector modulation (SVM) control for two level power inverter and three level Neutral Point Clamped (NPC) power inverter under **Matlab/Simulink**.
 - Implementation of SVM control using **Arduino Due** board for a real SEMIKRON two level inverter and an emulator of three level Neutral Point Clamped (NPC) inverter.
 - Publication of 2 international conference papers.
- **Internship at Schlumberger (Hassi Messaoud, Algeria) (3 months) :**
 - Conducted within the “Wireline” department in Hassi-Messaoud, Algeria.
 - Performing an “open-hole” wireline logging job in Tebessa, Algeria.
 - Performing a “cased-hole” wireline logging job in Hassi-Messaoud, Algeria.
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Publications :

- “Poster : Towards Edge-Based Small Language Models for Automated Network Management via Two-Stage Adaptation”.
The 22nd Annual International Conference on Distributed Computing in Smart Systems and the Internet of Things (DCOSS-IoT 2026), Conference rank (ERA) : B.
Zine el abidine Kherroubi, Monika Prakash, Tirth Master, Kavin Kumar Thangadorai, Michael Baddeley, Jean-Pierre Giacalone.
- “A Robust Actor-Critic Algorithm for CAV Decision Making under Impaired V2X Communication”.
IEEE Transactions on Intelligent Transportation Systems, Journal paper, T-ITS Impact Factor : 8.4.
Zine el abidine Kherroubi.
- “A Generalizable Actor-Critic Framework for Safe and Robust Driving in V2X Environments”.
2025 IEEE 28th International Conference on Intelligent Transportation Systems (ITSC 2025), Conference rank (QUALIS) : B1.
Zine el abidine Kherroubi.
- “A Novel Actor-Critic Algorithm for Handling Impaired V2X Communication”.
The 2025 IEEE 102nd Vehicular Technology Conference (VTC2025-Fall), Conference rank (QUALIS) : A1.
Zine el abidine Kherroubi.
- “Poster : Could Large Language Models Perform Network Management ?”.
International Conference on Embedded Wireless Systems and Networks (EWSN 2024), Conference rank (ERA) : A1.
Zine el abidine Kherroubi, Monika Prakash, Jean-Pierre Giacalone, Michael Baddeley.
- “AUTODRAITEC : An Infrastructure-based AUTOnomous DRiving System using Artificial Intelligence and TEleCommunication Technologies”.
International Joint Conference on Artificial Intelligence (IJCAI 2024), Demonstration track, Conference rank (Qualis) : A1.
Zine el abidine Kherroubi, Fouzi Boukhalfa, Thierry Lestable, Carlos-Faouzi Bader.
- “AUTODRAITEC : A Novel AI-based System on the Road Infrastructure for Autonomous Driving - Proof of Concept”.
35th IEEE Intelligent Vehicles Symposium (IV 2024), Conference H-index : 93.
Zine el abidine Kherroubi, Fouzi Boukhalfa, Thierry Lestable.
- “Review of Driver Behavior Modeling for Highway On-ramp Merging”.
IET Intelligent Transport Systems, Journal paper, Scopus Impact Factor : 3.31.
Zine el abidine Kherroubi, Samir Aknine.
- “Multimodal transformers for wireless communications : A case study in beam prediction”.
ITU Journal on Future and Evolving Technologies, Journal paper.
Yu Tian, Qiyang Zhao, Zine el abidine Kherroubi, Fouzi Boukhalfa, Kebin Wu, Faouzi Bader.

- “*Novel Decision-Making Strategy for Connected and Autonomous Vehicles in Highway On-ramp Merging*”. **IEEE Transactions on Intelligent Transportation Systems**, Journal paper, Scopus Impact Factor : 9.551.
Zine el abidine Kherroubi, Samir Aknine, Rebiha Bacha.
 - “*Leveraging on Deep Reinforcement Learning for Autonomous Safe Decision-Making in Highway On-ramp Merging*” (Student Abstract).
AAAI-2021 The Thirty-Fifth AAAI Conference on Artificial Intelligence, Conference rank : A1.
Zine el abidine Kherroubi, Samir Aknine, Rebiha Bacha.
 - “*Novel Off-board Solution for Predicting Drivers’ Intentions using Probabilistic Classifiers*”.
WI-IAT’20 The 2020 IEEE/WIC/ACM International Joint Conference On Web Intelligence And Intelligent Agent Technology, Conference rank : B.
Zine el abidine Kherroubi, Samir Aknine, Rebiha Bacha.
 - “*New Off-board Solution for Predicting Vehicles’ Intentions in the Highway On-Ramp using Probabilistic Classifiers*” (Student Abstract).
AAAI-2020 The Thirty-Fourth AAAI Conference on Artificial Intelligence, Conference rank : A1.
Zine el abidine Kherroubi, Samir Aknine, Rebiha Bacha.
 - “*Dynamic and intelligent control of autonomous vehicles for highway on-ramp merge*” (Extended Abstract).
AAMAS-2019 International Conference on Autonomous Agents and Multiagent Systems, Conference rank : A1.
Zine el abidine Kherroubi, Samir Aknine, Rebiha Bacha.
 - “*A Dynamic Bayesian Network Based Merge Mechanism for Autonomous Vehicles*” (Student Abstract).
AAAI-2019 The Thirty-Third AAAI Conference on Artificial Intelligence, Conference rank : A1.
Zine el abidine Kherroubi, Samir Aknine, Rebiha Bacha.
 - “*Real time implementation of space vector pulse width modulation for three level neutral point clamped (NPC) inverter using Arduino DUE board*”.
CENCON-2017 2017 IEEE Conference on Energy Conversion.
Zine El Abidine Kherroubi, Mostefa Kermadi, El Madjid Berkouk, Zainal Salam.
 - “*Real Time Implementation of Space Vector Pulse Width Modulation using Arduino DUE board*”.
IECON-2016 The 42nd Annual Conference of the IEEE Industrial Electronics Society, Conference rank : B1.
Zine El Abidine Kherroubi, Fethi Akel, Mostefa Kermadi, El Madjid Berkouk.
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Patent Grants :

- “*Systems And Methods For Robust Decision-Making For Connected And Autonomous Vehicle With V2X Information*”.
Patent No. US 12,722,658 B2.
Patent link : <https://image-ppubs.uspto.gov/dirsearch-public/print/downloadPdf/12722658>
Application number : US18/987,394.
Application link : <https://patents.google.com/patent/US20250214622A1/en>
Assignee : Technology Innovation Institute - Sole Proprietorship LLC.
Inventors : Zine el abidine Kherroubi.
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Patent Applications :

- “*System and Method on the Road Infrastructure for Controlling Connected and Autonomous Vehicles*”.
US Patent Application No. US63/739,276.
Publication number : 20260188115.
Link : <https://patents.justia.com/patent/20260188115>
Assignee : Technology Innovation Institute - Sole Proprietorship LLC.
Inventors : Zine el abidine Kherroubi, Fouzi Boukhalfa.

Languages :

- **English** : Advanced.
 - **French** : Advanced.
 - **Arabic** : Native.
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Awards :

- Second prize in the “*Multi Modal Beam Prediction Challenge 2022 : Towards Generalization*” (Third prize in the “*ITU AI/ML in 5G Challenge 2022*”).
 - Finalist for the “*three-minute presentation*” within the student track in the *Thirty-Third AAAI Conference on Artificial Intelligence (2019)*.
 - Renault Foundation scholarship (2015).
 - Valedictorian of the Automatic Control Systems Engineering class at the National Polytechnic School of Algiers (*class of 2015*).
 - Silver Medal in the National Olympiad of Physical sciences in *Algeria (2010)*.
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Talks and Presentations :

- **Ai Everything Global** (Dubai, UAE, 2025) : Gen-Zero Mesh Shield Demonstration.
 - **IEEE Intelligent Vehicles Symposium (IV 2024)** (Jeju, South Korea, 2024) : “AUTODRAITEC : A Novel AI-based System on the Road Infrastructure for Autonomous Driving - Proof of Concept”.
 - **GITEX GLOBAL** (Dubai, UAE, 2022) : “Infrastructure-based Autonomous Driving using AI and Telecommunication Technologies”.
 - **AAAI-19** (Honolulu, USA, 2019) : “A Dynamic Bayesian Network Based Merge Mechanism for Autonomous Vehicles”.
 - **SIA congress** (Paris, France, 2018) : “L’Intelligence Artificielle pour l’automobile : Avancées techniques et nouveaux métiers”.
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Certificates and Trainings :

- Generative AI training program - Finetune Gen AI (WeCloudData).
 - Improving Deep Neural Networks : Hyperparameter Tuning, Regularization and Optimization (Coursera).
 - Neural Networks and Deep Learning (Coursera).
 - Entrepreneurial Operations : Launching a Startup (edX).
 - A Crash Course in Data Science (Coursera).
 - Python for Data Science : Fundamentals Course (Dataquest.io).
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Memberships :

- The Association for the Advancement of Artificial Intelligence (AAAI).
 - ITU CITS Expert Group on Communications Technology for Automated Driving.
 - IEEE ITS Society.
 - The Hardware Academy.
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