Mohamed Amine **LEGHERABA**



MohamedLEGH | +33 6 30 82 90 00 | mlegheraba@protonmail.com

PhD Student in Artificial Intelligence & Computer Engineer

Education

Sorbonne Université, LIP6 — *Paris*
PhD — *2023 - 2026*

- Thesis: Peer-to-peer protocols for efficient and resilient decentralized learning

Polytech Sorbonne — *Paris*
Engineering Degree — *2015 - 2018*

- Major in Applied Mathematics and Digital Computer Science
- Coursework: Statistics | Differential Equations | Programming | Data Structures | Parallelism

TU Delft — *Netherlands*
Erasmus Semester — *Winter 2017*

- Coursework: Graph Theory | Cryptography | Blockchain | Cloud Computing | Data Visualization

Polytech Sorbonne — *Paris*
PeiP (Polytech Engineering School Pathway) — *2013 - 2015*

- Coursework: Mathematics | Computer Science | Physics | Chemistry | Mechanics

Professional Experience

Sorbonne Université, LIP6 — *Paris*
PhD Student in Computer Science — *Feb. 2023 - Present*

- Scientific research: State of the art on federated learning, 5 papers published in international conferences, 2 papers in a French conference, 1 paper submitted to a journal, creation of 4 algorithms (Elevator, HEAL, Lift, FLAIR), mathematical modeling completed and implementation on peer-to-peer networks, participation in summer/winter schools and thematic days
- Research internship: 3 months at NII (National Institute of Informatics) in Tokyo, Japan, collaboration with an international team of researchers
- Supervision: 4 interns, industrial project (5 MAIN5 students working one year with a company), initiation project (4 MAIN3 students working 3 months on a research project)
- Academic collaboration: Co-authored paper with a research engineer, ongoing collaboration project with Alstom
- Project management: Monitoring of the European NEMO and CyberNEMO projects, organization of the 2024 LIP6 PhD students' day
- Presentations: International conferences (NCA, AINA, CANDAR), GDR RSD summer school 2023 and winter school 2024, workshops at LIP6 and LINCS

Deloitte — *Paris*
Senior Blockchain & DevOps Engineer — *June 2021 - Jan. 2023*

- Support to financial audit teams: Blockchain transaction auditing, internal control and custody procedures review
- Technical audit and consulting: Smart contract and blockchain application audits, architecture review, coordination with international teams
- Client training (banking and industry) on blockchain, crypto-assets, NFTs and metaverse
- Article writing: NFTs and metaverse, study on DeFi and CBDCs, benchmark on blockchain carbon footprint
- Deloitte Foundation project: Blockchain and NFT discovery workshop for middle school students in Sarcelles, in partnership with NomadicLabs

Sia Partners — *Paris*
Blockchain & DevOps Engineer — *Apr. 2019 - June 2021*

- CBDC experiments at Banque de France: Technical expert, technical scoping of an experiment, support for 2 other experiments, team training on Blockchain and DevOps methodology, CI/CD pipeline implementation
- Trading limits monitoring via a blockchain network for an investment fund (mission obtained through my network and delivered end-to-end)
- Development of a mobile cryptocurrency payment application for a French distributor
- Heka project: Software factory for Data Science applications (Python and React microservices, continuous deployment on Kubernetes)
- R&D watch: Blockchain networks Liquid, Libra and TON, technologies Lightning Network, HTLC Atomic Swap, Zero-knowledge proofs, Raft protocol, Taproot and Multi-Party Computation
- Article writing: Blockchain & 5G, interview of Pierre Noizat

Teaching

Polytech Sorbonne & Mines St Étienne — *Paris & St Étienne*
2019 - Present

- Teaching Assistant: Networks lectures and lab sessions, Database Management lab sessions, Industrial project supervision, Initiation project supervision (2023-2025)
- Industry Lecturer: Programming a Blockchain - Polytech Sorbonne & Mines St Étienne (2019-2023)

Technical Skills

Blockchain	Ethereum | Corda | Hyperledger | Bitcoin | Tezos
Smart Contracts	Solidity | Ligo | SmartPy | Chaincodes
Mathematics	Cryptography | Statistics | Graphs | Mathematical proofs
Programming	Python | JavaScript | Ocaml | C/C++ | Kotlin | Java | Julia
Frameworks	ReactJS | Node.js | Ethers.js | Flask | Web3.py | PyTorch | Numpy
Databases	PostgreSQL | MySQL | SQLAlchemy
Protocols	Lightning Network | IPFS | TCP/IP | Peer-to-peer protocols | Gossip protocols
DevOps	Kubernetes | Ansible | Gitlab CI/CD | GCP | Terraform
Tools	Shell | Git | Docker | VS Code | SLURM
Methodology	Agile | REST APIs | Microservices
Research	Scientific research | Paper writing | Conference presentations | Federated Learning | Machine Learning | Deep Learning

Functional & Business Skills

Business	Commercial proposal writing | Client relations | Market and ecosystem knowledge
Decentralized Finance	Stablecoins | DeFi protocols | Private key security | Bridge with traditional finance
CBDC & Market Infrastructure	Crypto-euro implications | Target2 & Target2 Securities | PvP & DvP
Audit	Smart contract audits | Blockchain technology audits | Blockchain startups & fintech audits | Financial audit

Languages

French	Native
English	Proficient (TOEIC: 935)

Volunteer Work

Association Le Trait D'Union — *Paris*
Tutoring & Treasurer
Since 2018

- Homework help for middle and high school students
- Grant application writing, treasurer

Hobbies

Electronics

- Retro gaming console with a Raspberry Pi, fan control via a transistor, …

Socio-economic doctrines study

- Liberalism, Austrian school of economics, anarchism, technoethics, …

Publications

[1] M. A. Legheraba, M. Potop-Butucaru, and S. Tixeuil, "Brief Announcement: A Self-* and Persistent Hub Sampling Service," in *International Symposium on Stabilizing, Safety, and Security of Distributed Systems*, 2024, pp. 461–465.

[2] M. A. Legheraba, M. Potop-Butucaru, S. Tixeuil, and S. Fdida, "Emergent Peer-to-Peer Multi-Hub Topology," in *2024 22nd International Symposium on Network Computing and Applications (NCA)*, 2024, pp. 219–226.

[3] M. A. Legheraba, M. Potop-Butucaru, S. Tixeuil, and S. Fdida, "Des noeuds anonymes hissés au rang de stars," in *ALGOTEL 2025–27èmes Rencontres Francophones sur les Aspects Algorithmiques des Télécommunications*, 2025.

[4] M. A. Legheraba, N. Rachdi, M. Potop-Butucaru, and S. Tixeuil, "LIFT: Byzantine Resilient Hub-Sampling," in *2025 Thirteenth International Symposium on Computing and Networking (CANDAR)*, 2025, pp. 1–9.

[5] M. A. Legheraba, S. Galkiewicz, M. Potop-Butucaru, and S. Tixeuil, "HEAL: Resilient and Self-* Hub-based Learning," in *International Conference on Advanced Information Networking and Applications*, 2025, pp. 200–211.

[6] M. A. Legheraba, S. Galkiewicz, M. Potop-Butucaru, and S. Tixeuil, "Les étoiles montantes de l'apprentissage distribué," in *ALGOTEL 2025–27èmes Rencontres Francophones sur les Aspects Algorithmiques des Télécommunications*, 2025.