Hamza Halladj, Ph.D. Candidate

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Profile

Ph.D. Candidate in Cloud Security at Université de Constantine 2, specializing in distributed cloud architectures, IoT systems, and real-time AI.
My research focuses on fault-tolerant distributed infrastructures and intelligent access control for smart environments.
I have published work on multimodal violence detection combining physical actions and emotional cues, bridging AI, security, and human behavior analysis.

Education

2025 – Present — **Ph.D. Candidate, Université Constantine 2** in Secure Cloud Architecture.
Thesis title: *Development of Secure Integrated Systems for Smart Campus*

2022 – 2024 — **M.Sc. Computer Science, Université Constantine 2** in Networks and Distributed Systems.
Valedictorian *— Highest-ranked graduate, university-wide.*
Thesis title: *Smart Access Control through IoT in MISC Laboratory.*

2019 – 2022 — **B.Sc. Computer Science, Université Constantine 2.**
Thesis title: *Laptop Price Prediction Using Machine Learning for the Algerian Market.*

Research Publications

Conference Proceedings

1. H. Halladj, A. Bouzenada, D. E. Saidouni, M. R. Bennamoun, and A. Nouari, "A multimodal approach for real-time violence detection based on physical actions and facial expressions," in *Proceedings of the First International Conference on Smart Applications (ICSA 2025)*, Accepted for publication, to appear November 2025, 2025.

Seminars and Talks

- Presenter, ITRANS 2025 – University of Constantine 2, Constantine, Algeria. *Talk: Building Integrated IT Services for Research and Development.*
- Workshop Instructor, *WebExpo 2025 El Djazair*, Constantine, Algeria. Workshop:*Introduction to Python Programming for Web Development.*
- Presenter, *SENV'24 – Smart Environments Seminar*, University of Constantine 2, Constantine, Algeria. Talk: *Smart Access Control via IoT: Contribution to the Smart City Project at the MISC Laboratory.*
- Workshop Instructor, *GDG DevFest 2022*, Constantine, Algeria. Delivered a technical workshop titled *"Create Your First Web Service Using Go"*, introducing participants to backend development concepts and modern API design.

Professional Experience

Sep 2024 – Present

Instructor in Machine Learning, *Socode (socode.tech)*

- Designed and taught a complete Artificial Intelligence program to **100–200 students**, covering supervised learning, regression, classification, neural networks, and Generative AI.
- Supervised hands-on Python projects, emphasizing practical implementation and ethical AI practices.

Jun 2025 – Jul 2025

Intern Supervisor, *MISC Laboratory (misc-lab.org)*

- Supervised interns over 45 days in deploying WiFi-Enterprise infrastructure for the lab, supporting **20–100 users** using 802.1X, LDAP authentication, and FreeRADIUS.

Dec 2024 – Jul 2025

Research Project: Real-time Violence Prediction and Access Control System, *Ph.D. Project, MISC Laboratory (misc-lab.org)*

- Developed a microservices-based, event-driven architecture for real-time violence detection and intelligent access control.
- Applied deep learning (ResNet) and emotion recognition, achieving **97% detection accuracy** with minimal latency for real-time video processing.

Nov 2023 – Jul 2024

Research Engineer, *MISC Laboratory (misc-lab.org)*

- Implemented formally verified, context-aware service discovery and collaboration protocols within a middleware for IoT-connected devices, enabling self-healing and recovery in distributed environments.
- Integrated and deployed facial-recognition-based access control services on top of the middleware as part of the Smart Lab project.

Dec 2023 – Jan 2024

Performance Comparison of Wireless Protocols: IEEE 802.11ax vs 802.11ac vs 802.11n *Supervised by Dr. Salim Benayoune* `Project Report`

- Conducted an in-depth performance analysis of IEEE 802.11ax, 802.11ac, and 802.11n protocols, focusing on throughput, latency, and client scalability across different network scenarios.
- Simulated wireless networks using `ns-3` with varying parameters such as modulation schemes, guard intervals, bandwidths, and client loads ranging from 2 to 128.

Teaching Experience

2024 – Present

Lab Instructor, Université de Constantine 2 – Abdelhamid Mehri

- Conducted and supervised laboratory sessions for **Master's-level courses** in:
  - **Distributed Algorithms** – implementation of consensus, fault-tolerance, and leader election mechanisms.
  - **Advanced Operating Systems** – process synchronization, concurrency, and inter-process communication.
- Prepared lab materials, evaluated student work, and guided students in designing and implementing distributed and concurrent systems.

Teaching Assistant, Université de Constantine 2 – Abdelhamid Mehri

- Assisted in practical sessions (*Travaux Dirigés*) for the **Master's course: Verification and Validation of Distributed Systems**.
- Supported students in applying formal verification, model checking, and testing methods to distributed architectures.

Leadership & Community Involvement

Sep 2022 – Dec 2023

Instructor & Community Organizer, Google Developer Group (GDG) Constantine

- Led workshops and events such as DevFest 2021–2022, introducing participants to Go, web services, and cloud technologies.
- Promoted peer learning and collaboration through interactive, hands-on sessions.

Skills

Languages:

- **English** — IELTS 7.5 (C1 Level)
- **French** — TCF B2 Level
- **Arabic** — Native Speaker

Programming and Frameworks: Python, Go, JavaScript, TypeScript, C, Haskell, Ruby on Rails, Laravel, Express.js, React.js, Gin, Docker, Kubernetes.

Artificial Intelligence and Data Science: Machine Learning (Scikit-learn, TensorFlow, PyTorch), Deep Learning, Generative AI, Computer Vision, Emotion and Behavior Recognition, Model Evaluation and Optimization.

Cloud and Distributed Systems: Cloud Security, Microservices Architecture, Event-Driven Systems, Apache Kafka, AWS, JADE Agent Platform, RESTful Services, IoT Integration, Smart-Lab Middleware Development.

Networking and Simulation: Network Design and Analysis, Wireless Protocols (IEEE 802.11ax/ac/n), ns-3 Simulation, FreeRADIUS, Secure Access Control Protocols.

Skills (continued)

- **Databases and Tools:** SQL, NoSQL (MongoDB, Redis), PostgreSQL, Linux Environments, Git, CI/CD Pipelines, Office Suite (Excel, Word, PowerPoint).