

# AMINE LBATH

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PhD Candidate in AI for Software Security and AI Researcher at NIST

## Experience

### AI Researcher | NIST

2024 – present | Gaithersburg, U.S.

- Developing a self-improving AI agentic framework for software vulnerability detection using Reinforcement Learning
- Boosted software vulnerability detection accuracy by 20% via a novel data augmentation pipeline leveraging RAG retrieval and LoRA fine-tuning to synthetically inject realistic vulnerabilities into code
- Developed **AWE** (Agentic Workflow Engine), a low-code Python library for building, executing, and fine-tuning AI agentic workflows

### AI Research Scientist (Intern) | Nokia Bell Labs

2023: Mar. – Aug.; Sep. – Dec. (part-time) | Paris Saclay, France

- Improved by 2x the energy efficiency of a Deep Learning model, using Knowledge Distillation in Python TensorFlow
- Pitched frugal AI best practices to ML researchers through internal seminar

### Software Engineer (Intern) | Worldline

May 2022 – Aug. 2022 | Lyon, France

- Improved the configuration time of a payment application development environment by 15% by automating processes using Java Spring, Liquibase, Bash, GitLab CI/CD
- Assisted the Scrum master in planning sprints using Jira tickets, as part of an Agile team of 8 developers

### Software Architect (Intern) | Revartis

June 2021 – Aug. 2021 | Zurich, Switzerland

- Designed and developed a PoC from scratch for a new product, covering requirements engineering, database modeling, and RESTful API specifications (Java Spring Boot)

## Education

### PhD Candidate | Université Grenoble Alpes

2024 – present | Gaithersburg, U.S.

AI-based software vulnerability detection

### M.S. in Computer Science and Data Science (IF) | INSA Lyon

2020 – 2023 | Lyon, France

Graduated with highest distinction - Top 5% (16.3/20)

**Relevant Courses:** Data Science, Deep Learning (NLP, GenAI ...), Statistics, Software Engineering, Project Management

**Awards:** • 1<sup>st</sup> team/15 at the INSA SMART challenge 2022 • 1<sup>st</sup> prize/100 participants at INSA video challenge 2019

### M.S. Academic Exchange: ML and Data Science | DTU

Aug. 2022 – Jan. 2023 | Copenhagen, Denmark

### Preparatory Department | INSA Lyon

2018 – 2020 | Lyon, France

Undergraduate intensive program in Mathematics, Physics and Engineering Sciences (Top 5% out of 800 students)

## Selected Projects

### Instant Listing | Mobile App

2025

- Co-developed a full-stack iOS app to automate online product listing generation using an AI agentic workflow.
- Engineered the workflow, implemented API integration, and built UI with Flutter.

### Privacy Keeper | INSA SMART challenge

1<sup>st</sup> prize | S1 2022

- Led a team of 8 to design and develop from scratch an AI-powered full stack security and privacy chrome extension using Node.js, React and Machine Learning models (git)

### Business Developer | ETIC INSA Technologies (Junior-Enterprise student club)

2021 – 2022 (part-time)

- Sought new business opportunities by contacting clients, from individual entrepreneurs to multinational groups
- Recruited student consultants for projects and took part in quality assurance

### Co-Founder, mobile game developer | A&M Studios

2018 – 2020 (part-time)

- Designed, developed and published mobile games on Google Play with over 3.6K cumulated downloads using Unity C#, Play Console and AdMob (Game)

## Papers

- CyberForge: Verified Vulnerability Injection at Repository Level for Cybersecurity Agent Training, A. Lbath, et al.
- Toward Scalable Automated Repository-Level Datasets for Software Vulnerability Detection, A. Lbath, FSE 2026 DS
- AVIATOR: Towards AI-Agentic Vulnerability Injection Workflow for High-Fidelity, Large-Scale Code Security Dataset, A. Lbath, et al., under review Journal of Systems and Software
- Energy Efficiency in AI for 5G and Beyond: A DeepRx Case Study, A. Lbath, et al., EuCNC 24

## Technical Skills

- **Languages:** Python, JavaScript/TypeScript, C++, SQL
- **Frameworks/Libraries/Tools:** PyTorch, HuggingFace Transformers, LangGraph, Next.js, Docker, Unity