Mahugnon Honoré **HOUEKPETODJI**

R&D Engineer II · PhD Computer Science

Paris, France

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"Current Synopsys Employee (Ansys France) | Seeking Internal Transfer to US Operations"

Professional Summary

PhD in Computer Science with **7+ years of experience** developing **desktop and web-based applications for engineering simulation**. Currently R&D Engineer II at **Ansys France (Synopsys)** building next-generation **MBSE modeling platform** with expertise in **technical/scientific computing workflows**. Proficient in **Java/Spring Framework** (7+ years), **C++** (scientific computing, numerical methods), and **Python**. Strong background in **object-oriented design**, **performance optimization**, API architecture, and large-scale commercial software development. Published 3 peer-reviewed papers including IEEE ICSME Industrial Track.

Professional Experience

Ansys France (now part of Synopsys)

Lille, France

R&D Engineer II — *Nov. 2022 - Present*

- Research on integration of **Spring AI** and **Model Context Protocol (MCP)** for conversational AI capabilities.
- Design and develop **complex backend solutions** using **Java, Spring Boot**, focusing on **clean architecture**, API integration, and system customization for global SaaS platform.
- Configure **OAuth2 authentication** and security frameworks with Spring Security
- Collaborate with **other teams** including product management
- Develop both frontend (Angular) and backend (Java Spring Boot) components, troubleshooting **complex technical issues**
- Work independently with minimal supervision on feature development from design through validation, conducting **code reviews**, participating in **technical meetings for architecture discussions**, and contributing to **code refactoring** based on architectural decisions
- *Key Technologies: Java Spring Boot, Angular, Spring AI, Model Context Protocol, PostgreSQL, REST APIs, OAuth2, Microservices, Distributed Systems, CI/CD*

INRIA / SA-CIM (Orisha Lille)

Lille, France

PhD Researcher in Computer Science — *Mar. 2019 - Jun. 2022*

- Conducted applied research on **modernizing software development practices** in industrial context, resulting in **3 peer-reviewed publications** including prestigious IEEE ICSME Industrial Track conference.
- Contributed to development of **software analysis tools** processing 2M+ lines of legacy code, demonstrating ability to work with complex large-scale codebases and 3rd party system integration.
- Created comprehensive suite of **software engineering tools** improving business process efficiency: static analysis engine, dead code detection system, architectural visualization platform, and automated quality assessment tools.
- Designed and built **CIMTicketsAnalyse**: developed **Spring Boot REST API** backend for internal data integration, connected to **Smalltalk/Pharo Seaside** application for data cleaning, metric computation, and web-based visualization of team productivity analytics and development workflow insights
- Led implementation of complete **CI/CD pipeline** using Jenkins with automated testing, build management, and deployment orchestration.
- **Participated in research planning and architecture** decisions for software modernization strategies, conducting extensive analysis of development practices and proposing data-driven improvements.
- **Taught programming labs** (TP) to 1st-year Computer Science students at University of Lille for one year, developing curriculum, mentoring students through hands-on coding exercises, and receiving positive teaching evaluations.
- **Mentored and trained** development teams on new tools, software engineering best practices, agile methodologies, and continuous improvement approaches.
- **Impact:** Accelerated client migrations by 40%, automated testing workflows reducing bugs by 30%, improved team efficiency on the project case study.
- *Key Technologies: Smalltalk Pharo, Moose Plateform,Static Analysis, Java Spring Boot, Jenkins, PostgreSQL, REST APIs, CI/CD, Software Architecture, API Integration, Research Methodologies*

INRA (National Institute for Agricultural Research) *Paris, France*

C++ Software Developer - Scientific Computing (Internship) *Apr. - Sep. 2018*

- Implemented **dairy cow metabolism simulator** in **C++** by translating documented mathematical models into code within an existing scientific computing framework
- Developed biochemical pathway simulation components using **ordinary differential equations (ODEs)** and **numerical solvers**, applying object-oriented programming principles to model complex metabolic reactions
- **Optimized simulation performance** by benchmarking and integrating alternative numerical integration methods (Adams-Bashforth, Adams-Bashforth-Moulton vs. Runge-Kutta 4), achieving **15% reduction in execution time** while maintaining computational accuracy
- Validated simulation results against reference data, ensuring numerical precision ($\varepsilon = 10^{-4}$) and biological consistency of metabolic predictions
- *Technologies: C++11/14, Visual Studio, STL, Numerical Methods, ODE Solvers, Object-Oriented Programming, Performance Optimization, Scientific Computing*

Core Technical Skills

Backend & Development	Java (7+ years - Expert), Spring Boot, Python, C++, Object-Oriented Design, Design Patterns, Clean Code
AI & Integration	Spring AI, Model Context Protocol (MCP), AI/ML Integration, 3rd Party Software Integration, System Interoperability
APIs & Web	REST APIs, API Design & Development, OAuth2, Microservices Communication, JavaScript, Angular, React, TypeScript
Data & Performance	PostgreSQL, MongoDB, MySQL
DevOps & Quality	Docker, CI/CD (Azure DevOps, GitHub Actions, Jenkins), Git, Automated Testing
Collaboration & Leadership	Agile/Scrum, Code Reviews, Teaching, Cross-functional Collaboration, Research & Planning
Languages	French (Native/Fluent - C2), English (Fluent - C1, TOEFL ITP)

Education

University of Lille / INRIA *Lille, France*

PhD in Computer Science *2019 - 2022*

- **Specialization:** Software Engineering, Legacy System Modernization, Static Analysis, Distributed Systems, Development Process Optimization
- **Dissertation:** "Modernizing Software Development Practices in Industrial Context" - Applied research on improving development workflows and code quality in enterprise environments
- **Industry Partnership:** CIFRE program (Convention Industrielle de Formation par la Recherche) - industry-sponsored PhD demonstrating ability to bridge academic research with commercial software development
- **Published 3 peer-reviewed papers** in international conferences and journals (IEEE ICSME, arXiv)

University of Sousse *Tunisia*

Master of Science in Intelligent Pervasive Systems *2016 - 2018*

- **Focus:** Machine Learning, Algorithm Optimization, Parallel Computing, Distributed Systems, Software Architecture

University of Gabès *Tunisia*

Bachelor of Science in Computer Science *2013 - 2016*

- **Foundation in:** Programming, Data Structures, Algorithms, Software Engineering, Database Systems

Publications & Research

2021	**1st Author**, Houékpétodji M. H., Anquetil N., Ducasse S., et al. "Report From The Trenches: A Case Study In Modernizing Software Development Practices" - IEEE ICSME 2021 Industrial Track	*International Conference on Software Maintenance and Evolution*
2020	**Co-Author**, Anquetil N., et al. (including Houekpetodji M. H.) "Modular Moose: A New Generation Software Reverse Engineering Environment" - arXiv preprint	*Software Engineering Research*
2020	**1st Author**, Houekpetodji M. H., Anquetil N., Ducasse S. "Improving Practices in a Medium French Company: First Step" - HAL Research Report	*Applied Software Engineering Research*

Full publication list and research details: `https://mahugnon-honore.fr`