Mahieddine Dellabani

Tech Lead | Scalable & High-Performance Systems

I am a seasoned R&D software engineer with deep expertise in Java, JVM internals, and high-performance database systems. My work focuses on building efficient, scalable, and reliable software, with a strong emphasis on concurrency, distributed systems, and observability. I have extensive experience in CI/CD, containerization, and monitoring stacks, ensuring robust and maintainable deployments.

Passionate about software architecture and clean code, I continuously explore emerging technologies and experiment with new features to solve real-world challenges. I take a pragmatic approach to reducing technical debt, optimizing performance, and designing systems that balance scalability, maintainability, and long-term efficiency.

Beyond technical expertise, I have experience leading teams, mentoring engineers, and contributing to product roadmaps, ensuring alignment between technical execution and business goals.

Resume Contact

About me

R&D software enginner with strong technical skills. Autonomous, self-motivated and curious, but mostly not afraid of new challenges and eager to learn new technologies. Open minded, sociable and used to work in a multicultural collaborative environment. As an engineering manager, I strive at making a great product for both users and developers : Foster innovation, promote best practice and ensure engineers' happiness.

Location: Saint-Medard, 64370, France

Age: 34

Nationality: French / Algerian

Interests: Football, Vinyl, Piano, Surf, Snorkling

Employment: Freelance.

TECH STACK

Languages

Tools, Libraries and Frameworks

Databases

WORK

09/2023
-
02/2025

R&D Software Engineer Freelance

Huawei - Full Remote (1 week per month in Grenoble)

Grenoble Fermat Lab. is responsible for advanced technical research and development of Model-based and Formal methods for different business domains including Automotive and ICT. The team is responsible for building formal modeling, simulation, verification and code generation tools for the design and development of trustworthy and efficient embedded software.

- 🔥 **Scalable & High-Performance DSL Runtime:** Designed, implemented, tested, and benchmarked a Java runtime interpreter and exploration engines for a domain-specific language.
- 🛠️ **API Design & Extensibility:** Designed a user-friendly API to expose and parameterize runtime internals, enabling seamless configuration, enhanced observability, and greater flexibility for developers.
- 📦 **Canonical Serialization & Database Integration:** Implemented **canonical serialization** for structured data persistence and seamless interoperability. Designed and optimized data handling for **SQLite** and **Neo4j**, ensuring efficient storage, retrieval, and query performance.
- 🚀 **Java Migration & Modernization:** Led the migration from Java 8 to Java 21, leveraging new features like **Records, Virtual Threads, and Structured Concurrency** to enhance performance and maintainability.
- 🔍 **Formal Methods & Verification:** Explored modeling technologies for developing trustworthy software.
- 🤝 **Cross-Team Collaboration:** Worked closely with **Supply Chain teams** to address performance issues and implement their use cases, ensuring high-quality, robust software solutions.
- ⚙️ **CI/CD & Infrastructure Modernization:** Updated all **CI/CD scripts**, led the migration of **Jenkins**, and ensured a more efficient and reliable build pipeline.
- 📖 **Engineering Best Practices:** Established team-wide best practices, including **Architecture Decision Records (ADR)**, improved **repository documentation**, and structured the **wiki** for better knowledge sharing.

API DESING · DSL RUNTIME · FORMAL METHODS · PERFORMANCE · BENCHMARKING · SERIALIZATION

SQLITE NEO4J JAVA 21 ECLIPSE OSGI C++

SQL CYPHER GTILABCI JENKINS DOCKER

SONARQUBE CONCURRENT SYSTEMS SIMULATION

Open Contributor

SquashQL - Full Remote

09/2023 - 03/2024

SquashQL is an open-source SQL query engine designed to streamline the process of building multi-dimensional queries. At its core, it acts as a middleware layer that stands between SQL databases and multiple clients or front-end applications.

- 🔥 **Compiled Queries & API Refinement:** Led a significant restructuring of the query API by introducing `CompiledXXX objects`, separating query user API from query engine internals, ensuring cleaner code and better maintainability. This redesign simplifies query execution, enforces the SRP principle abd enable the introduction of the vector aggregation feature.
- 📅 **Date Functions Support:** Added support for **date functions** within the query engine, improving query flexibility and user capabilities.
- 🛠️ **API Enhancements:** Introduced a public `total_count` measure, counting the total number of results not considering the query limit.
- ⚙️ **Query Scope & Resolver Optimization:** Streamlined query scope management by introducing **QueryResolver**, replacing static helper methods with a more flexible and scalable approach.
- 🔄 **String Removal & Field Optimization:** Spearheaded the initiative to replace all **Strings** in query building with typed **Field** objects, paving the way for future POJO query compilations and improving query resolution consistency.
- 📈 **Execution Graph Simplification:** Simplified the query execution graph, optimizing performance and making it easier for developers to manage complex queries.

API DESIGN QUERY OPTIMIZATION PERFORMANCE SQL

DATABASE ENGINEERING DATE FUNCTIONS JAVA 21

FIELD OBJECTS COMPILER CONCURRENCY

Technical Lead

Activeviam - Full Remote (1 week per month in Paris)

06/2019 - 09/2023

As part of the R&D team, I designed and built Atoti, a real-time decisive data analytics software for financial services.

- 👨‍💻 **Team Leadership & Mentoring:** Led a team of 6 engineers, overseeing development, design sessions, and code validation. Provided mentorship, supervised project planning, and coordinated team efforts to ensure timely delivery and adherence to best practices. Owner of the distributed, monitoring and aggregation modules.
- 💻 **Product Development:** Designed, built, tested, and deployed Atoti Java API capabilities: Aggregation engine, real-time updates, distributed computing, MDX querying.
- 📊 **Monitoring:** Involved in enhancements and implementations of Atoti Application Performance Monitoring stack: Tracing, metrics, and logs.
- 🤝 **L2 Support:** Solved performance issues and assisted clients in using the APIs.
- ⚙️ **JDK Features Prototype:** Supervised the internship and university project focused on maximizing the impact of new JDK capabilities in Atoti Java API (projects Loom and Panama).

IN-MEMORY DISTRIBUTED SYSTEM AGGREGATION CONCURRENCY MONITORING JAVA 17 JAVASCRIPT ZIPKIN LOGSTASH GRAFANA PROMETHEUS DOCKER ATOTI ACTIVEPIVOT CIRCLECI ARTIFACTORY GITHUBACTIONS SPRINGBOOT REST MDX OLAP LEADERSHIP TEAM MANAGEMENT

R&D Software Engineering

INGIMA - Paris

INGILAB is the Innovation Lab and POC Factory of INGIMA, focused on exploring new possibilities with its motto "explore by doing." As part of INGILAB, I worked on various research studies and proof of concepts in multiple fields such as image processing, machine learning, and embedded systems.

- 📄 **PDF Parsing & Extraction:** Developed and optimized a solution for analyzing nutrition table conformities by parsing and extracting relevant data from PDF documents. This

09/2018 - 06/2019

project aimed at automating the comparison and validation of nutrition information to ensure accurate product distribution.

🧠 **OCR Project with Google Cloud:** Led the OCR (Optical Character Recognition) project using Google Cloud to extract text from images and scanned documents, improving data accessibility and processing efficiency for distribution clients.

OCR | GOOGLE CLOUD | PDF PARSING | MACHINE LEARNING | IMAGE PROCESSING | DATA EXTRACTION | CARREFOUR

Full Time Researcher - PhD in Computer Science and Mathematics

Verimag - Grenoble

10/2014 - 09/2018

My thesis focused on the design, optimization, and validation of distributed real-time applications for embedded systems. Specifically, it delved into using formal methods to address challenges in distributed real-time environments, such as communication delay, optimization issues, and clock drift.

⚙️ **Distributed Real-Time Applications:** Designed and optimized real-time applications for embedded systems using formal methods to solve critical issues like communication delay and clock drift.

📊 **Formal Methods & Verification:** Applied formal methods, including timed automata and model-based development, to verify the correctness and performance of the distributed systems.

FORMAL METHODS | MODEL-BASED DEVELOPMENT | TIMED AUTOMATA | DISTRIBUTED SYSTEMS | EMBEDDED SYSTEMS | OPTIMIZATION | VERIFICATION | JAVA | ACCELEO | ECLIPSE

Teaching Fellow

IUT Valence - Université Grenoble Alpes - Valence

📊 **Introduction to Excel:** Taught freshmen the fundamentals of Excel, covering data organization, formulas, and basic

09/2015 - 09/2016

analytics.

🧰 **Introduction to Relational Databases:** Guided sophomore students through database concepts, including SQL queries, schema design, and normalization.

TEACHING | EXCEL | SQL | RELATIONAL DATABASES | DATA ANALYSIS

EDUCATION

Exchange Student in Computer Engineering

Iowa State University - USA

Fall 2014

ADVANCED COMPUTER ARCHITECTURE | RECONFIGURABLE SYSTEMS | DISTRIBUTED SOFTWARE DEVELOPMENT

Engineering Diploma - Embedded Software and Systems

Grenoble INP PHELMA/ENSIMAG - France

09/2011 - 09/2014

🚀 **Engineering thesis:** Vectorization of compression algorithms using SIMD instructions. Realtors: Prof. S. Viardot, Ing. R. Schulze, Dr. T. Willhalm. Thesis activity carried out during the final year project at SAP SE, Walldorf, Germany.

MATHEMATICS | PROGRAMMING | OPERATIONAL RESEARCH | OPERATING SYSTEMS | REAL-TIME EMBEDDED SYSTEMS | HARDWARE DESIGN | C++ | SAP HANA

SKILLS

Programing

- Java
- JavaScript / TypeScript
- SQL / MDX
- Bash
- C / C++

Frameworks

- Spring Cloud Sleuth
- Spring Boot
- Expo
- React/Next.js

Cloud Services

- AWS - S3
- Azure - Storage
- Azure - Durable Functions
- GCP - Vision API

Spoken languages

- English
- French
- Arabic
- Spanish

PUBLICATIONS

Local Planning of Multiparty Interactions with Bounded Horizons
Authors: Mahieddine Dellabani, Jacques Combaz, Marius Bozga, Saddek Bensalem
FM 2016: 199-216

Knowledge Based Optimization for Distributed Real-Time Systems
Authors: Mahieddine Dellabani, Jacques Combaz, Saddek Bensalem, Marius Bozga
APSEC 2017: 751-756

Formal methods for distributed real-time systems. (Méthodes formelles pour les systèmes distribués temps-réel)
Authors: Mahieddine Dellabani
Grenoble Alpes University, France, 2018

S BIP 2.0: Statistical Model Checking Stochastic Real-Time Systems
Authors: Braham Lotfi Mediouni, Ayoub Nouri, Marius Bozga, Mahieddine Dellabani, Axel Legay, Saddek Bensalem
ATVA 2018: 536-542

Local Planning Semantics: A Semantics for Distributed Real-Time Systems
Authors: Mahieddine Dellabani, Jacques Combaz, Saddek Bensalem, Marius Bozga
Leibniz Trans. Embed. Syst. 6(1): 01:1-01:27 (2019)