Giuseppe **Muntoni**

M.Sc. Computer Science student · Software engineer

Pisa, Italy

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Work Experience

AgileLab — *Remote*

Big Data Engineer | **Scala, Apache Spark, Apache Kafka, Apache Hive, Hadoop HDFS** — *January, 2022 - June, 2022*

- Supplied the migration of all streaming applications to a new virtual environment, achieving 100% data alignment between the two environments, using platforms like Apache Hive, Apache Kafka, and Hadoop HDFS.
- Member of the Code Quality group, monitoring and compiling the quality metrics of twelve applications altogether, and achieving test coverage of more than 95% on average, and the availability of technical documentation for each application.
- Engineered and programmed a code generation tool that generates boilerplate code of Spark jobs, which reduces the written lines of code by 10% and the development time.

OneTag — *Pisa, Italy*

Software Engineer | **Java, Scala, Eclipse Vert.x, Aerospike, Kubernetes, AWS S3** — *January, 2021 - December, 2021*

- Redesigned a crawler that manages the analysis of more than 100k websites each run, achieving a 50% performance improvement by focusing on readability and maintainability of the code.
- Developed and maintained reactive code in Eclipse Vert.x, capable of scaling up to 300k requests per second.

Reply — *Florence, Italy*

Software Engineer | **Java, Spring** — *May, 2020 - December, 2020*

- Contributed to the development and testing of a Change Data Capture (CDC) service for the migration from legacy db to the cloud, reaching a real-time alignment between them.
- Coached the customer to adopt microservice architecture for their future products, writing a document describing the patterns and best practices to build microservice-based applications.
- Optimized the code of an application by parallelization, increasing the performance by 30%.

Education

Master's degree in Computer Science — *University of Pisa*

CURRENT GPA : 4.0 — *September, 2022 - February, 2025*

- Main courses: Compilers, Algorithm design, Information retrieval, High-Performance Computing, Models of computation, System and network hacking, Cloud Computing, Advanced Network Architectures and Wireless Systems, Parallel and Distributed systems

Bachelor's degree in Computer Science — *University of Pisa*

FINAL GPA: 4.0 — *September, 2016 - July, 2020*

- Main courses: Operating Systems, Computer networking, Theory of computation, Formal languages, Algorithms and data structures

Publications

Soldani, J., **Muntoni, G.**, Neri, D., Brogi, A., **"The microTOSCA toolchain: Mining, analyzing, and refactoring microservice-based architectures"** Software: Practice and Experience 51. 7 (2021): 1591 — *April, 2021*

- Automatic generation of the architecture of microservice-based applications, then automatic detection and resolution of architectural smells.
- Conceptualized and prototyped the automatic generation of the architecture, with 100% of accuracy.

Muntoni, G., Soldani, J., Brogi, A. (2021). **"Mining the Architecture of Microservice-Based Applications from their Kubernetes Deployment"** In: Zirpins, C., et al. Advances in Service-Oriented and Cloud Computing. ESOCC 2020. Communications in Computer and Information Science, vol 1360. — *March, 2021*

- Managed a successful presentation at the conference ESOCC, 2020 edition

Projects

MicroC: **Compiler of a C-like language written in Ocaml** — *September, 2022 - November, 2022*

- Successfully built the lexer with Ocamllex and the lr(1) parser with Menhir. Implemented a type checker and a simple dead-code analysis. Finally, implemented the code generation to LLVM IR

microMiner : **A tool to automatically generate the architecture of a microservice-based application** — *January, 2020 - June, 2020*

- Engineered a prototype, written in Python, able to automatically build the graph representing a microservice-based application, distinguishing from other similar products by being able to discern business domain services from databases, message routers and message brokers.
- Fulfilled the 100% of accuracy for the tested applications.