

Leonardo Micelli

· RESEARCH FELLOW IN COMPUTER SCIENCE @UNIVERSITÀ DEGLI STUDI DI URBINO CARLO BO ·

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Education

University of Bologna

Cesena, Italy

Computer Science and Engineering Master's Degree

September 2021 - March 2024

- **Final Grade:** 108/110
- **Research Thesis:** designed an implementation of the aggregate computational paradigm in **Rust** with the objective of democratize aggregate computing, bringing it to thin devices. Poc distributed system consisting of **esp microcontrollers** with **Rust** and **esp-rust**.
- **Favourite Courses:** Pervasive Computing (Systems modelling via Petri Nets and Markov Chains, Aggregate computing with **scafi** and **Scala**, Digital Twins and Web of Things), Programming and Development Paradigms (functional programming with **Scala**, logic programming with **Prolog**), Concurrent and Distributed Programming (Actor based programming with **Akka**, Reactive programming with **RXJava**, **Vert.x**), Distributed Systems (**RabbitMQ**, **MongoDB**, **Protobuf**, **Docker**), Web Services and Applications (**Typescript**, **React**, **Docker**, **MongoDB**, **Node.js**, **Next.js**), Software Systems Laboratory (**Gradle**, DevOps with **Git** and **Github Actions**).

University of Bologna

Cesena, Italy

Computer Science and Engineering Bachelor's Degree

September 2018 - May 2021

- **Thesis:** Design and development of a middleware to integrate smart health devices from different vendors. Implemented a poc mobile application with **React Native**.
- **Favourite Courses:** Object-Oriented Programming (**Java**), Databases (**SQL**, **Microsoft SQL Server**), Internet of Things (**C++**, **Arduino**, Mobile Programming (**Java** and **Android**), Programming (**C**), Algorithms and Data Structures.

Work Experience

Università degli studi di Urbino Carlo Bo

Urbino, Italy

Research Fellow

March 2024 - Present

- **Human Digital Twin Aggregate:** this work-in-progress project aims at enabling aggregate analytics and symulation on Human Digital Twins through the concept of **Aggregate Digital Twin**, implemented in the Digital Twin platform developed during my previous works.
- **Human Digital Twin: a WLDT Implementation:** this paper was submitted for 2025's edition of the *GoodIT Conference*. In said paper, alongside my supervisor, we proposed a general and extensible framework to develop **Digital Twin-based applications in the healthcare context**. My main contributions were in co-designing the proposed framework and developing a proof-of concept¹ system for a use case on hypertension digital twin-based treatment.
- **Augmentation Functions in WLDT:** in this project, I proposed an architectural extension of the WLDT framework to account for the concept of **Augmentation Functions** in Digital Twins. My main contribution in the project were the architectural design and implementation of said extension.
- **iDASY:** Digital twin system for monitoring the neuro-motor development of preterm infants: my activity for this project focuses on the design of a **Digital Twin to mirror infant neuro-motor development in the virtual world**, providing more advanced services through the definition of models and cognitive services based on AI advanced algorithms that exploit heterogeneous acquired data.
- **Bachelor Thesis co-supervisor:** co-supervised a bachelor's level thesis at the Carlo Bo University. My main activities involved support in thesis structure and providing pointers to relevant sources on the subject.
- **Internship co-supervisor (Bachelor's level):** co-supervised a bachelor's level curricular internship at the Carlo Bo University. My main activities involved providing learning materials and general guidance on best practices to tackle the internship's challenges.

Philip Morris International

Bologna, Italy

Data Engineer

February 2024 - February 2025

- **Agromoncal Data Base:** This project consisted of developing and managing an ETL pipeline with the objective of periodically extract weather information of Tobacco Growing Areas from an external API, transform it to better fit the data model and loading it in a Snowflake DataBase. I worked with: **Matillion ETL**, **Python**, **Amazon S3** and **Snowflake**.
- **Sustainability Dashboard:** I took the role of **Product Owner and Developer** of the Sustainability Dashboard, which calculates critical KPIs such as tonnage of acquired material and recyclability. Worked with: **Microsoft Power BI**, **Microsoft Dataflows**.

Dofra srl

Ravenna, Italy

Software Engineer

June 2021 - August 2021

- **Gebat Desk:** My objective for this project was to develop a **mobile app** in **Android** that could connect to the industrial chargers the company produces via Bluetooth and WiFi, collect valuable information about the machine, and transmit it to a service that would store it in a DataBase. I developed the mobile application in **Android** and **Java**, and implemented the service using **Typescript**, **NodeJs**, **ExpressJs**, **Mongoose**. The DBMS chosen for this use case was **MongoDB**.