Claudio Giovanni Mattera
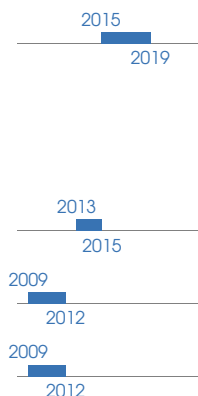
Short Curriculum Vitæ / Résumé

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Education

2015 – 2019

Ph. D. in software engineering, *Maersk McKinney Moller Institute, University of Southern Denmark*, Odense, Denmark, `https://www.sdu.dk/`
My topic was designing and implementing software solutions for fault detection and diagnostics on buildings energy systems. My Ph. D. was part of the project COORDICY, a Danish-American interdisciplinary program aimed at increasing buildings intelligence. The main research partners were NASA Ames Research Center, Lawrence Berkeley National Laboratory, and University of California, Berkeley.
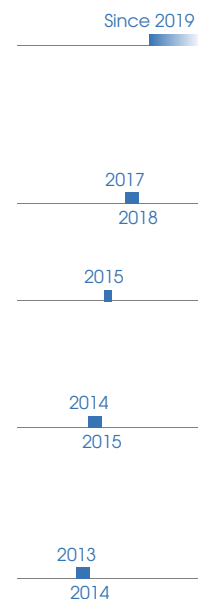
2013 – 2015

Individual courses, *Coursera Network*, `https://www.coursera.org/`
I took several individual courses to improve my knowledge on specific areas and technologies.

2009 – 2012

Master's degree in engineering mathematics, *Lund University*, Sweden, `https://www.lu.se/`
Scientific computation and software. Focus on numerical calculus.

2009 – 2012

Master's degree in computer engineering, *Polytechnic of Milan*, Italy, `https://www.polimi.it/`
Complex systems analysis and optimization. Focus on modelling and operational research.

Work experience

Since 2019

Software & Systems Developer, *Siemens Gamesa Renewable Energy*, Brande, Denmark, `https://www.siemensgamesa.com/`
I work in the team in charge of application diagnostics for the company's wind-turbines fleet. I am responsible for designing and implementing a new monitoring and diagnostics framework unifying Siemens and Gamesa technologies, using modern tools and techniques.

2017 – 2018

Research Assistant, *University of Southern Denmark*, Odense, Denmark, `https://www.sdu.dk/`
I took a six-months leave from my Ph. D. to carry out additional work on the project COORDICY. My tasks included developing libraries and tools, and integrating the data infrastructure at the department.

2015

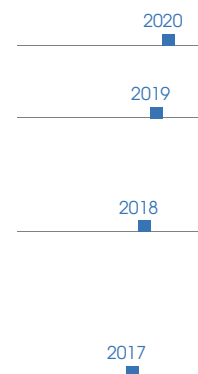**R&D C++ Developer**, *Altran*, Sophia Antipolis, France, `https://www.altran.fr/`
I was a contractor at Amadeus, market leader in IT solutions for airlines. I worked on the backend of the route selection component, which was used for searching combinations of legs from source to destination. My tasks included bug fixing, code refactoring, and implementing new features.

2014 – 2015

Java Developer, *Prisma Telecom Testing*, Milan, Italy, `https://www.prismatelecomtesting.com/`
The company develops physical testing solutions and simulators for radio network equipment. I worked on the graphical interface of the simulator, used for designing testing experiments. My tasks included bug fixing, developing features on existing branches, and implementing a prototype interface for a new network subset

2013 – 2014

IT Assistant Internship, *Carl Zeiss Italy*, Arese, Italy, `https://www.zeiss.it/`
One of the worldwide leading companies in industrial metrology, biotech technology and medical microscopy. I was one of the two members of the IT department at the Italian headquarters. My tasks included daily IT support, system administration, and planning and implementing system migration

Publications

2020

Fault Detection in Ventilation Units using Dynamic Energy Performance Models, **DOI: 10.1016/j.jobe.2020.101635**

2019

Fault Detection and Diagnostics in Ventilation Units Using Linear Regression Virtual Sensors, **DOI: 10.1109/ISAECT.2018.8618755**

Consensus-based Method for Anomaly Detection in VAV Units, **DOI: 10.3390/en12030468**

2018

Online Energy Simulator for Building Fault Detection and Diagnostics Using Dynamic Energy Performance Model, **DOI: 10.1093/ijlct/cty019**

A Method for Fault Detection and Diagnostics in Ventilation Units Using Virtual Sensors, **DOI: 10.3390/s18113931**

2017

A Practical Approach to Validation of Buildings' Sensor Data: a Commissioning Experience Report, **DOI: 10.1109/BigDataService.2017.48**

Personal projects

Available on my GitHub page: `https://github.com/claudiomattera/`

cfei-smap	Python 3 asynchronous and type-annotated library for sMAP data protocol
java-libraries	Collection of Java libraries for sMAP data protocol, pandas-like data-frames and time-series, and EnergyPlus weather file format
rinfluxdb	Rust library for querying and sending data to InfluxDB
house-dashboard	Rust application for displaying environment data on a physical dashboard
wasm4fun	Rust games for the WASM-4 fantasy console
traffic-tracker	Rust application to fetch traffic statistics from GSM routers
modernthesis	LuaLATEX / KOMA-Script modern template for a Ph. D. thesis
fixed-point-vector	C++11 compile-time packed fixed-point-vector library
naivecoin	C++17 test-driven blockchain cryptocurrency implementation
gps-tracker	C++ / Qt application for displaying a GPX paths and tracking the total distance
linear-programming	Haskell test-driven step-by-step simplex algorithm solver
pandoc-tikz	Haskell application for embedding TikZ figures in Markdown documents
qr-encoder	PyQt application for generating QR codes
graph-extractor	PyQt application for extracting coordinates from charts

Academic projects

Master's thesis — **Optimization heuristic for residential energy load management**

I designed and implemented in C++ a heuristic to solve a difficult combinatorial optimization problem applied to residential energy load management. The aim was to find a schedule of all residential appliances over a set of houses, in order to generate a smooth energy demand curve. I employed features from the at-the-time-novel C++11 standard, and I strove to follow the best practices and advanced idioms promoted by the language experts, to achieve better performances and maintainability.

Bachelor's thesis — **A RDBMS based Linux filesystem to manage metadata extracted from files**

I developed a filesystem driver in C# that used a RDBMS backend. The driver extracted metadata from files such as images, text, and videos, and stored them in custom tables in order to perform fast searches.

Other experiences

2017 — 2019
Member of the Academy Council, *Technical Faculty, University of Southern Denmark*
The council oversees scientific hiring and evaluation of Ph. D. degrees at the faculty.

2015 — 2018
Volunteer at student association, *ESN*, Odense, Denmark, `https://esnodense.dk/`
The association welcomes and supports international students and organizes trips and other events.

2012 — 2015
Volunteer at student association, *ESEG*, Milan, Italy, `http://www.eseg.it/`
The association welcomes and supports international students and organizes trips and other events.

Languages

Italian	Native	
English	Fluent	*Several years working in international environments in multiple countries*
Swedish	Intermediate	*One year (four courses, 30 ECTS) full-time study at Lund University*
Danish	Intermediate	*Modultest 3 (three semesters) at Lærdansk*

Computer skills

Platforms	Windows, Linux (Gentoo), Raspberry Pi, Arduino, ESP8266
Languages	Python, Java, C++, Rust, Haskell, LATEX
Other	Git, Mercurial, Subversion, Qt Library, InfluxDB, Docker

Hobbies and other interests

Cycling	I like to make long trips by bike, but also to cycle everyday
Reading	I like to read new stories and new adventures
Homebrewing	I like to brew my own ale and mead (and to drink them, in moderation)