

Mariaclaudia Nicolai



Biomedical Data Scientist – Digital Health

My curiosity has always driven me, along with my ability to connect different skills. For this reason, I chose to take on various roles as a pharmacist, researcher, developer, and web designer. This journey has provided me with a much more comprehensive understanding of digitalization in the biomedical sector. My strength is integrating diverse skills to facilitate complex projects and foster dialogue between teams with different objectives. I understand how different fields think, and I know how to make the most of multidisciplinary collaborations.

EXPERIENCE

Front-End Developer – Web design

July 2024 – Present. AltraBits, Remote

- Developed responsive web pages and dashboards in React, JavaScript, HTML, and CSS
- Managed data flow between front-end, back-end, and databases
- Created graphic design to support marketing initiatives

Research Assistant – Biomedical Imaging

July 2023 – May 2025. Università della Svizzera italiana (USI) – Lugano, Switzerland

- Investigated the impact of rendering methods on CNN performance for biomedical time-series analysis
- Developed image analysis pipelines and CNN models to study neutrophil migration from intravital microscopy under inflammatory conditions
- Collaborated with imaging experts to validate simulations and interpret biological patterns

Trainee – Bioinformatics and Deep Learning Research

March 2021 – June 2023. Institute for Research in Biomedicine (IRB) – Bellinzona, Switzerland

- Developed LSTM, BERT, and GPT-2 models to predict SARS-CoV-2 spike protein mutations and TCR-antigen binding affinities
- Analyzed protein structures using Pymol and conducted molecular dynamics simulations of peptide-ligand interactions with Amber.
- Evaluated models (ROC, AUC, cross-validation) and integrated experimental datasets
- Contributed to a better understanding of antigen-specific immune responses, supporting ongoing antitumoral development efforts
- Collaborated with molecular biologists to interpret outputs in the context of immunological mechanisms

Visiting student – Machine Learning

July 2018 – June 2019. Delft University of Technology (TUDelft) – Delft, The Netherlands

- Applied sentiment analysis and machine learning in a user-centered healthcare Android app
- Gained experience in an interdisciplinary machine learning application.

EDUCATION

Master's Degree in Pharmacy and Industrial Pharmacy

September 2013 – March 2020. University of Salerno, Italy

Thesis: Identification of a new model of antimicrobial peptide activity through machine learning ([Link](#)).

Qualification to practice the pharmacist profession. July 2023. University of Salerno, Italy

SKILLS

Technical:

Programming & Data Analysis: Python (ML, data analysis), R (basic), JavaScript (React, APIs)

ML & DL Libraries: PyTorch, TensorFlow, scikit-learn, Keras

Statistical & Biostatistical Methods: Regression, ROC, AUC, cross-validation, time-series analysis

Exploratory Data Analysis & Visualization: pandas, NumPy, matplotlib, seaborn

Biomedical Tools: Amber (molecular dynamics), PyMOL (structural analysis), Biopython (sequence analysis)

Software Development & Version Control: Git, GitHub, REST APIs, Database management

Soft:

Strong communication: peer-reviewed publications, international conference presentations

Cross-functional collaboration: clinicians, researchers, developers

Problem-solving & adaptability: startup and academic research environments

Detail-oriented analytical mindset: data validation, statistical rigor

Project ownership & autonomy: independent pipeline design, end-to-end implementation

Languages:

Italian – Native speaker

English – C1

German – A1

PROFESSIONAL DEVELOPMENT

ICH E6 (R2) GCP Investigator Site Personnel Training – FormazioneNelFarmaceutico.com, 2025

Precision Health Day – MeDiTech and EOC, 2025

International Center of Advanced Computing for Medicine – ICAM Workshop, 2024

Imaging the immune system (IIS) – EMBO Workshop, 2023

Machine Learning – Politecnico di Milano, 2022

CONTACT

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EXTRA INFO

Projects – [GitHub link](#)

Publications – [View list](#)