ANDREA POLETTI

Bioinformatician and Data Science Specialist

CONTACT

TELEPHONE (and WhatsApp):
+39 334-7850424

E-MAIL:
andrea.poletti5@gmail.com

LinkedIn:
https://www.linkedin.com/in/andrea-poletti-218a97110/

PERSONAL INFO

DATE OF BIRTH: 4 Oct 1991

NATIONALITY: Italian

Personal Summary: Bioinformatician with 7 years of experience, specializing in data-driven solutions and large-scale genomic data analysis for healthcare and biotech applications. Expertise in programming (Python and R), statistical data analysis and developing scalable pipelines/algorithms for multi-omics data integration, enabling actionable insights and optimizing workflows. Proficient in handling big-data generated by modern technologies (WGS, RNA-seq, single-cell sequencing) using machine-learning, computational workflows and cloud systems. Passionate about leveraging data science and bioinformatics to drive innovation and enhance decision-making processes, ultimately improving patient outcomes and accelerating the development of precision medicine applications.

KEY PROFESSIONAL ROLES

Bioinformatician Research Fellow – University of Bologna
Bologna, Italy – from Feb 2018 to Present

- Designed end-to-end bioinformatics/clinical data workflows, effectively addressing complex challenges and delivering tailored technical solutions.
  E.g. conceptualized and validated a novel targeted sequencing panel for diagnostics, combining cost-efficiency and practical application for clinical routine.
- Designed and implemented scalable data analysis pipelines, reducing processing time by 50% and enhancing reproducibility across projects. Applied machine learning models to multi-omics datasets, improving predictions for patient outcomes.
- Led cross-functional international collaborations with clinicians and data scientists to translate genomic data into clinical insights for healthcare applications.

Visiting Researcher – Dana-Farber Cancer Institute / Broad Institute of Harvard and MIT
Boston, Massachusetts, US – from Mar 2022 to Jan 2023

- Collaborated with globally recognized experts in cancer genomics and bioinformatics, integrating cutting-edge genomics research into actionable solutions.
- Developed bioinformatic tools to analyze and harmonize complex genomic data, enabling precise tracking of copy number alterations in cancer evolution.
- Designed scalable methodologies for single-cell genomic data analysis, enhancing data reproducibility and cross-institutional collaboration.

Visiting Scientist – Francis Crick Institute
London, UK – from Jan 2019 to Apr 2019

- Developed custom R-based pipelines for ultra-deep NGS analysis, improving the detection of low VAF mutations.
- Conducted machine-learning analyses on genomic data to uncover patterns of clonal evolution, contributing to the refinement of prognostic tools.

LANGUAGE SKILLS

Language	Italian	English
Listening	Native	B2
Reading	Native	C1
Speaking	Native	B2
Writing	Native	C1

Levels: A1 and A2: Basic user, B1 and B2: Independent user, C1 and C2: Proficient user.

WEBSITE

https://github.com/andrea-poletti-unibo

GitHub

EDUCATION

PhD in Biomedical Sciences (2019 - 2023)
University of Bologna, Italy

- Focus on cancer genomics and bioinformatics, with expertise in developing computational methods for NGS data analysis and clonal evolution tracking.
- Dissertation: TiMMing: developing a bioinformatic suite of tools to harmonize and track the origin of Copy Number Alterations in the evolutive history of Multiple Myeloma. Results published in *Nature Genetics*.

Master's Degree in Health Biology (2015 - 2017)
University of Bologna, Italy
Grade: 110/110 cum Laude

- Specialized in human health and genomics, with hands-on experience in molecular biology and bioinformatics.
- Thesis: Development of bioinformatics approaches for Multiple Myeloma genomic data interpretation.

Postgraduate Master's Degree in Machine Learning and Big Data in Precision Medicine and Biomedical Research (2024 – Present, *expected in 2025*)
University of Padua, Italy

- Advanced training in machine learning and deep-learning techniques, big data integration, and applications in precision medicine and biomedical research.

TECHNICAL SKILLS

Programming and Data Manipulation
- Python, R, Bash, SQL – R packages development
- Data wrangling, visualization, and manipulation (tidyverse, matplotlib, ggplot2, Plotly, etc.)
- Dashboards and data storytelling (Shiny apps)

NGS and Multi-omics Data Analysis
- Creation of optimized solutions for NGS data analysis (WGS, RNA-seq, targeted-seq, Bioconductor workflows)
- Single-cell and multi-omics data integration.

Machine Learning and AI
- Development of predictive models for clinical applications (scikit-learn, caret, deepsurv, TidyModels)
- Application of deep-learning techniques to large-scale genomic datasets (Keras, TensorFlow)

Pipeline Development and Automation
- Workflow management tools: Snakemake, Nextflow
- Containerization: Docker, Singularity
- Version control: Git, GitHub, GitLab

High-Performance Computing (HPC) and Cloud Computing
- Experience in parallel computing on HPC clusters
- Cloud platforms: AWS, GCP

RESEARCH PROFILES LINKS

ORCID:
0000-0002-0753-1248
https://orcid.org/0000-0002-0753-1248

Scopus ID:
57429675100
https://www.scopus.com/authid/detail.uri?authorId=57429675100

Google Scholar page
https://scholar.google.com/citations?user=7iZHltEAAAAJ

ResearchGate
https://www.researchgate.net/profile/Andrea-Poletti

INVOLVMENT IN FUNDED RESEARCH PROJECTS

- "**SYNTHIA: Synthetic Data Generation Framework for Integrated Validation of Use Cases and AI Healthcare Applications**", 2024-2029. Code: 101172872-SYNTHIA-HORIZON-JU-IHI-2023-05. IHI Grant through EU Funding.
- "**GenoMed4ALL: Genomics and Personalized Medicine for all though Artificial Intelligence in Haematological Diseases**", 2021-2025. Code: 101017549. EU Horizon 2020. DOI: https://doi.org/10.3030/101017549
- **"StreaMMing: the dynamics of Multiple Myeloma minimal residual disease in the peripheral blood stream"**, 2018-2024. AIRC Investigator Grant. code: AIRC-IG-22059, PI: Michele Cavo.
- "**AIMMer: A machine-learning approach to connect Multiple Myeloma complexity to early disease recurrence",** 2023-2026. PNRR M6/C2 CALL 2023, Code: PNRR-TR1-2023-12378246, PI: Elena Zamagni.

PUBBLICATIONS

Author of 13 peer-reviewed publications and 43 oral and poster communications accepted at international conferences (*source: Scopus / Google Scholar*).

FIRST-AUTHOR RESEARCH PAPERS

- **Alberge J.B., Dutta A. and Poletti A (co-first)**, et al. *"Genomic landscape of multiple myeloma and of its precursor conditions, and its clinical implications". Accepted for publication in* ***Nature Genetics***.

- **Terragna C. and Poletti A. (co-first)**, et al. *"Multi-dimensional scaling techniques unveiled gain1q&loss13q co-occurrence in Multiple Myeloma patients with specific genomic, transcriptional and adverse clinical features*". ***Nature Communications***, 15(1), 1551, 2024. DOI: 10.1038/s41467-024-45000-z

- **Mazzocchetti G. and Poletti A. (co-first)**, et al. *"BoBafit: A copy number clustering tool designed to refit and recalibrate the baseline region of tumors' profiles*". ***Computational and Structural Biotechnology Journal***, 20, 3718-3728, 2022. DOI: 10.1016/j.csbj.2022.06.062

AWARDS AND RECOGNITIONS

- **IMS Career Development Award – International Myeloma Society, 2022**
  Awarded a $75,000 grant to support career development. Recognized as a promising early-career researcher in plasma cell dyscrasias research.

- **ASH Abstract Achievement Award – American Society of Hematology, 2022**
  Awarded for outstanding abstract on copy number signature extraction in Multiple Myeloma.

- **IMS Young Investigator Award – International Myeloma Society, 2023**
  Honored for exemplary research and bioinformatics tool development for tracking cancer genomic evolution.

- **IRCCS Sant'Orsola Best Presentation Award – IRCCS Policlinico di Sant'Orsola Research Retreat, 2024**
  Recognized for the presentation *"TiMMing: A Bioinformatics Toolkit to Trace the Origin and Clinical Significance of Copy Number Alterations in Multiple Myeloma*".

- **Finalist of the "Under40 in Hematology" 2024 event**
  Selected among top young researchers in Italy for innovative contributions in hematology. The event promotes and rewards outstanding scientific production, methodology, scientific impact, and applicability.