Virginia Filippi

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Brief Bio

I hold a Master's degree in Artificial Intelligence and a Bachelor's degree in Bioinformatics, both *cum laude* at the University of Verona, where I will also begin my PhD in Engineering for Intelligent Systems in October 2025.

My research focuses on the development of machine learning and deep learning methods for neuroimaging, with emphasis on brain connectivity, network neuroscience, graph signal processing, and interpretable AI for healthcare and neurodegenerative diseases.

Alongside my research activities, I gained valuable teaching experience as a tutor in courses on signal and image analysis, supporting students in developing both theoretical understanding and practical skills.

Education

MS　**Artificial Intelligence** (English), University of Verona　　　　Oct 2022 – Mar 2025

- Final grade: 110/110 *cum laude*
- Thesis title: *Graph Signal Processing for Temporal Dynamics of Structure-Function Coupling in Brain Connectivity*
- Supervisor: Prof. Gloria Menegaz, Co-Supervisor: Dr. Ilaria Boscolo Galazzo, Dr. Lorenza Brusini
- Topics of interest: Artificial Intelligence applied to Bioengineering, Computer Vision, Machine and Deep Learning, Medical Imaging and Biomedical Signal and Image Processing, Graph Signal Processing
- Interesting projects done: Wavelets and Signal Processing combined with AI techniques, Deep Learning framework for classification and segmentation of biomedical images, Graph Continual Learning, Graph Neural Networks

BS　**Bioinformatics**, University of Verona　　　　Oct 2019 – Dec 2022

- Final grade: 110/110 *cum laude*
- Thesis title: *Connecting Network-Level Brain Structure-Function in Alzheimer's Disease*
- Supervisor: Prof. Silvia Francesca Storti, Co-Supervisor: Dr. Ilaria Boscolo Galazzo
- Topics of interest: Statistics and Machine Learning applied to Bioengineering, Medical Imaging, Biomedical Signal and Image Processing, Brain connectivity

BS　**Scientific High School, Applied Sciences option**, "Galileo Galilei" High School　　　　Sep 2014 – Jun 2019

- Topics of interest: Computer Science, Biology, Biotechnology, Bioinformatics

Fellowships & Grants

Graduate Research Fellowship n° N. BR37/24　　　　Feb 2025 - Apr 2025
"Borsa di animazione territoriale- Seminari" in the project *"ANTIAGING: ARTIFICIAL INTELLIGENCE FOR HEALTHY AGING"*, supervisor prof. Gloria Menegaz.
Research grant for assistance in organizing seminars on the application of artificial intelligence for healthy aging.

Publications

Poster presentation

V. Filippi, E. Paolini, F. Cruciani, L. Brusini, F. Dal Santo, G. Menegaz, I. Boscolo Galazzo, and S. F. Storti. *"Decoding the interplay between brain structural and functional connectivity in Alzheimer's disease,"* in Proc. 8th National Congress of Bioengineering (GNB), Padua, Italy, 2023.

National Congress of Bioengineering (GNB)
2023

In preparation

V. Filippi, G. Dolci, I. Boscolo Galazzo, L. Brusini, and G. Menegaz. *"Graph Signal Processing for Temporal Dynamics of Structure-Function Coupling in Brain Connectivity"*. In preparation for *NeuroImage*.

NeuroImage

Teaching Experience

"**Acquisition and analysis of biomedical images**" course, Graduate Teaching Assistant
- BSc in Human Centered Medical System Engineering
- Coordinator: Prof. Gloria Menegaz
- Laboratory (16 total hours): signal and image processing in MATLAB; exercises focused on the interpretation and analysis of biomedical images

University of Verona
2024-2025

"**Acquisition and analysis of biomedical images**" course, Graduate Teaching Assistant
- BSc in Human Centered Medical System Engineering
- Coordinator: Prof. Gloria Menegaz
- Laboratory (4 hours): signal and image processing in MATLAB; exercises focused on the interpretation and reconstruction of biomedical images

University of Verona
2023-2024

"**PLS Project: Computer Science**", Graduate Teaching Assistant
- BSc in Bioinformatics, Computer Science, Applied Mathematics, MSc in Data Science
- Coordinator: Prof. Ugo Solitro
- Laboratory (24 hours): programming in C, Java, Python; assistance to students in lessons, private lessons

University of Verona
2023-2024

"**Introduction to system and signal analysis with laboratory**" course, Graduate Teaching Assistant
- BSc in Human Centered Medical System Engineering
- Coordinator: Prof. Paolo Fiorini, dr. Lorenza Brusini
- Laboratory (24 hours): signal processing techniques in MATLAB; assistance to students in laboratories, preparation of teaching material

University of Verona
2022-2023

Internships

Research Intern - **Neuroimaging & AI**
- Supervisor: Prof. Silvia Francesca Storti
- Duration: total of 300 hours for 3 different internships
- Topics: machine learning and deep learning applied to MRI data; analysis of brain structural and functional connectivity in Alzheimer' disease; graph neural networks; statistical modeling and multivariate data analysis

University of Verona
2021-2023

Neurophysiopathology laboratory intern

<div align="right">"G.B. Rossi" Hospital,
Borgo Roma
June 2018</div>

- Duration: 90 hours
- Topics: study of genetic mutations that characterize peripheral nervous system diseases; biomedical laboratory techniques for DNA analysis

Computer Skills

Programming & Libraries: Python (PyTorch, TensorFlow), Matlab, C, Java

Data Analysis & Visualization: Scikit-learn, Numpy, Pandas, Scipy, Matplotlib, Seaborn

Medical Imaging Tools: FSL, MRtrix3

Other tools: LaTeX, SQL, AutoCAD (AutoCAD 2D, Autodesk Fusion 360), Unity

Languages

English: B2

Italian: Native

I authorize the processing of personal data contained in my curriculum vitae pursuant to art.13 of Legislative Decree 196/2003 and art.13 of EU Regulation 2016/679.

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