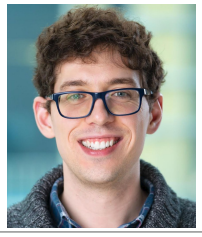

Mario Lavanga

Senior research engineer | AI & Biosignal Processing Scientist
m.lavanga@gmail.com | +41799085427

EDUCATION

KU LEUVEN
PhD in Electrical Engineering
Grad. September 2020 | Leuven, Belgium | Phd Graduation Video

POLITECNICO DI MILANO
MS in Biomedical Engineering
Grad. December 2015 | Milan, Italy | Final Grade: 100/100 cum laude

BS in Biomedical Engineering
Grad. December 2015 | Milan, Italy | Final Grade: 100/100 cum laude

ALTA SCUOLA POLITECNICA
Double degree programme with Politecnico di Torino
Grad. December 2015 | Turin, Italy | Final Grade: Excellent

LINKS

Mario Lavanga
Mario Lavanga
Mario Lavanga

SKILLS

PROGRAMMING
Python • Matlab • C# • Bash • Powershell • HTML • JavaScript • React

FRAMEWORKS
Azure • Azure AI Foundry • Azure DevOps • Tensorflow • ASP.NET • Git

LANGUAGES
Italian | Mother tongue • English | Fluent • German | Fluent • French | Intermediate Knowledge • 汉语 | Basic knowledge • Dutch | Basic Knowledge

AI CODING TOOLS
Claude Code • Gemini CLI • Qwen Code

PROJECT MANAGEMENT
Agile • Scrum • Waterfall • Sandwich

ABOUT ME

Passionate about decoding the human body through Signal Processing and AI. I specialize in multimodal sensor fusion (EEG, ECG, HRV, PPG, Respiratory) for various health monitoring topics. My background spans from modeling the aging brain to detecting real-time patient anomalies in the ICU and stress detection. I bridge the gap between academic rigour and product prototyping. I am an amateur actor and avid language learner. I love travelling in Asia.

RESEARCH

HAMILTON MEDICAL AG | Project Manager
December 2024 –Present | Domat/Ems, Switzerland
Leading the development of AI-driven and signal-processing cloud solutions for ventilation management. Orchestrating the lifecycle of advanced signal processing features from ideation, simulation to IP protection and regulatory approval.

HAMILTON MEDICAL AG | Senior Research Engineer
June 2022 –Present | Domat/Ems, Switzerland
Optimized real-time algorithms for the company's flagship devices to monitor and alleviate patient-ventilator interactions. Pioneered Deep Learning and rule-based systems to estimate respiratory mechanics and patient effort. Working on patent applications.

TNG - INS | Postdoctoral researcher
Oct 2020 –June 2022 | Marseille, France
Collaborated with Prof. Viktor Jirsa and Prof. Svenja Caspersto investigate virtual brain aging (Digital Twin) by simulating activity based on anatomical data. Part of the Human Brain Project and being showcased on EBRAINS. Code available here.

BIOMED GROUP - STADIUS | PhD Fellow
Jan 2016 –Sep 2020 | Leuven, Belgium
Developed a Perinatal Stress Calculator using multimodal biosignals (ECG, HRV, EEG) in collaboration with Prof. Sabine Van Huffel and Prof. Gunnar Naulears. The goal of this research focused on a data-driven stress quantification in premature babies by engineering robust features in noisy clinical environments. Collaboration with UZ Leuven.

SELECTED PUBLICATIONS

M. Lavanga et al., The virtual aging brain: Causal inference supports interhemispheric dedifferentiation in healthy aging. NeuroImage , 2023.
M. Lavanga et al., The effect of early procedural pain in preterm infants on the maturation of EEG and heart rate variability. Pain , 2021.
M. Lavanga et al., Maturation of the Autonomic Nervous System in Premature Infants: Estimating Development Based on Heart Rate Variability Analysis. Frontiers in Physiology , 2021.

Full publication list available on Google Scholar. H-Index: 13 and i10-Index: 17.

AWARDS AND VARIA

- Guest Editor for Frontiers in Network Physiology (2021-2022) | Talk at University of Virginia hosted by Prof. Randall Moorman.
- Falling Walls Lab Leuven Participant (2019) | KU Leuven Tech Transfer Laureate.
- FWO Strategic Basic Research Fellowship Recipient (2016).