Fabio Paolizzo, PhD | Curriculum Vitae

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PROFILE

An AI Researcher and Systems Architect with a primary focus on Quantitative Finance. I develop novel, uncorrelated alpha by designing and deploying proprietary trading systems that model complex human behavior and value perception in financial markets.

My approach is built on a unique combination of deep, long-term experience:

- **30 years of hands-on systems architecture**, providing a first-principles understanding of how to design and build complex, interactive, and emergent systems from the ground up.
- **25 years of leadership in grant-funded AI,** demonstrated by a Marie Skłodowska-Curie Global Fellowship and a consistent record of securing 'Excellent'-rated validation for multi-million-euro research programs.
- **5 years of R&D architecting a proprietary, alpha-generating trading ecosystem** for the live market validation of novel AI models.

GRANTS & AWARDS

- **Andrew W. Mellon Postdoctoral Fellowship** (2021–2023): Occidental College, Los Angeles. ($110K+). Dept. of Computer Science and Dept. of Music.
- **Marie Sklodowska-Curie Global Fellowship** (2015–2018): European Commission Research Executive Agency. Role: PI. (€244K). Dept. of Cognitive Science, University of California Irvine, and Dept. of Electronic Engineering, University of Rome Tor Vergata.
- **Fulbright Award Supervision & Mentorship Recognition** (2022–2023): For contribution to AI & HCI in Music/Acoustic Engineering.
- **Postgraduate Experience Award, Creative Campus Initiative** (2010–2011): For 'Velodrone,' an AI/interactive event for the London 2012 Olympics cultural program.
- **University of Kent, Full Ph.D. Scholarship** (2007–2013). School of Computing and Dept. of Music and Audio.

POSITIONS

- **Independent Quantitative Research & Systems Development, Quantitative Trading**
  Self-Directed | Global (2019–Present)
  - ➢ **Proprietary R&D Platform:** I architected and actively manage a proprietary, end-to-end R&D ecosystem designed for the rapid, iterative development and live-market validation of novel alpha signals. The platform integrates a high-performance backtesting engine with a reliable, automated execution module.
  - ➢ **Current Research Thrust—Alpha from Alternative Data:** My primary research program is focused on architecting and validating novel AI models to extract alpha from high-dimensional, unstructured data. This active R&D involves:

        - **Natural Language Processing (NLP):** Applying modern NLP techniques, including Transformer-based models, to process real-time news-flow for event detection and social media streams for sentiment and market mood analysis.
        - **Multimodal Data Fusion:** Leveraging my foundational research in multimodal AI to fuse disparate data types (e.g., text, sentiment, market data) into a single, coherent analytical framework to generate more robust and uncorrelated alpha signals.
    - ➢ **Architectural Principles:** The entire system was designed from first principles for horizontal scaling, ensuring its architecture is robust and compatible with large-scale, distributed computing environments.
    - ➢ **Validation & Methodology:** My research process, from concept to system design, is continuously validated against a network of quantitative researchers and systems engineers. Detailed architecture and verifiable performance metrics are available for discussion under an NDA.
- **Consultant, Large Language Models & Knowledge Graphs**
  University of Palermo, Dept. of Computer Engineering (2025–Present)
    - ➢ Advise an EU-funded project (MUSIC4D) on architecting and integrating Large Language Models and Knowledge Graphs for the analysis of complex, multi-modal data.
- **Postdoctoral Mellon Fellow, AI, Cognitive Science & Computational Arts**
  Occidental College, Los Angeles, Dept. of Computer Science, Dept of Cognitive Science and Dept. of Music (2021–2023)
    - ➢ Spearheaded and curated high-profile academic conferences, including a symposium on the sonification of complex scientific data, featuring a scientist from NASA's Jet Propulsion Laboratory (JPL).
    - ➢ Authored and delivered new graduate and undergraduate curricula in advanced technical fields, including 'Music & AI' and 'Audio Signal Processing,' establishing a new area of study within the departments.
    - ➢ Mentored a cohort of top-performing students in applied AI and HCI; my supervision was formally recognized by the Fulbright Program for its direct contribution to a successful student award.
    - ➢ Released: ‘Medusae’. Paolizzo, F., Mitchell, N. (2022). [CD audio], Don Giovanni Records. A practice-based case study in valuing real-time human-machine creative collaboration, demonstrating an ability to quantify the value of emergent, non-obvious creative output, reviewed in international publications such as *The Wire* and the *Chicago Reader*.
- **Scientific Coordinator & Marie Curie Principal Investigator**
  University of Rome Tor Vergata, Dept. of Electronic Engineering (2015–2020)
    - ➢ Served as Principal Investigator for MUSICAL-MOODS, a €244K project funded by a prestigious Marie Sklodowska-Curie Global Fellowship (H2020 Grant ID: 659434).
    - ➢ Architected and led the 'AI MUSE' proposal, a nearly €4 million H2020 research program (H2020-ICT, ID: 780060) designed to model high-dimensional, unstructured data using advanced AI. The proposal was officially rated 'Excellent' (12.00/15.00) by the European Commission.
        - Served as Principal Investigator and Scientific Coordinator, designing the core technical vision for a consortium of 11 elite academic and industry partners (including CNRS, TU Delft, and Bitwig) across 8 countries.

        - The project's architecture pioneered the use of multi-kernel deep learning, semantic graphs (knowledge graphs), and NLP/sentiment analysis to model emergent behavior—a direct precursor to modeling agent behavior in financial markets.
    - ➢ Previously, as Project Manager for the nearly €3.5 million PRO-MUSE proposal (H2020-ICT, ID: 688019), I managed an 8-partner consortium to develop a platform for mood-based user profiling using kernel-based machine learning. This proposal was also rated as 'high-quality' by the EC (11.00/15.00), establishing a consistent track record of designing world-class research programs.
- **CEO, VIVOflip (Startup Venture)**
  Rome, Italy (2013–2018)
    - ➢ Architected a novel, gesture-controlled interactive system for museum installations, pioneering the use of computer vision for real-time user interaction. The resulting product was acquired for permanent installation by the National Academy of San Luca.
    - ➢ Led the venture's commercialization strategy and played a principal role, as a consultant to the project's funding partner (ITAC srl), in securing the EU Regional Development funding.

EDUCATION

- **Ph.D. in Music and Technology |** University of Kent, UK (2007–2013)
    - ➢ **Focus:** Supervised by the School of Computing and the School of Music and Audio, my doctoral research involved architecting and developing 'VIVO,' an autonomous, interactive AI system to model emergent creative behavior and human-machine self-attention methods. This work established the formal methodology for analyzing complex systems that I now apply to modeling agent behavior in financial markets.
- **M.A. in Sonic Arts & Technologies** | University of Rome Tor Vergata, Italy (2013–2014)
    - ○ High Honors: *Maxima cum laude*.
    - ➢ **Focus:** Advanced training in applied Machine Learning, including Music Information Retrieval (MIR) and Digital Signal Processing (DSP), for the analysis of complex audio data.
- **M.A. in in Drama, Art and Music Studies** | University of Rome Tor Vergata, Italy (2000–2006)
    - ○ High Honors: *Maxima cum laude*.
    - ➢ **Focus:** Systems-based modeling of human creativity, human-computer interaction, and applying computational methods to analyze and generate aesthetic structures.
- **Diploma in Computer Programming** | ITC Crispi, Italy (1989–1996)
    - ➢ Early formal training in foundational languages including C++.

PUBLICATIONS & PROJECTS

- **Peer-Reviewed Research**
    - ➢ Paolizzo, F., et al. 2021. **A New Multilabel System for Automatic Music Emotion Recognition.** In: *Proc. of 2021 IEEE International Workshop on Metrology for Industry 4.0 & IoT.*
        - **Contribution:** Designed and validated a novel machine learning system for quantifying subjective emotional responses to music. This research solved a core technical challenge in my current work on modeling non-traditional data sources.
    - ➢ Paolizzo, F., Johnson, C. G. 2020. **Creative Autonomy in a Simple Interactive Music System.** *Journal of New Music Research.*

        - **Contribution:** Formalized a model of computational autonomy, demonstrating a method for analyzing emergent creative behavior in complex systems.
- **Research Systems & Datasets**
    - **Musical-Moods Dataset.** [Public Dataset].
        - **Relevance:** The primary outcome of a major EU-funded MSCA Global Fellowship. A large-scale, multimodal dataset (audio, video, text, mocap) for training AI models on complex, subjective human data, demonstrating expertise in data engineering for non-traditional sources.
    - **VIVO (Video Interactive VST Orchestra) System.** [Proprietary & Open Source Components].
        - **Relevance:** An intelligent, interactive AI system developed over two decades, serving as my primary R&D platform for modeling emergent novelty. The system's architecture implements real-time data processing, automated data segmentation for feature engineering, and pattern recognition using constrained Markov Chains, providing the foundational insights for my current work on identifying complex patterns in market data.

TECHNICAL COMPETENCIES & FOUNDATIONAL EXPERTISE

- **Quantitative Finance & Strategy:**
    - Mid-Frequency Strategy Development, Algorithmic Design & Validation, Alpha Signal Research, Complex Risk Management Protocols, Systematic Trading.
- **Systems Architecture & Engineering:**
    - High-Performance Backtesting Environments, Reliable Automated Execution Systems, Hybrid Systems Integration, API Integration.
- **AI & Deep Learning Systems:**
    - **Architectural Design**: Strategic design and application of modern AI methodologies, including Transformer-based LLMs and Representation Learning, for time-series analysis and extracting predictive signals from complex, unstructured data.
    - **Theoretical Grounding**: Deep theoretical understanding of the core concepts behind frameworks like PyTorch and TensorFlow, enabling effective leadership of research and implementation teams.
- **Knowledge Representation:**
    - Modeling complex, latent relationships and reasoning using Knowledge Graphs (e.g., Neo4j).
- **Languages & Technologies:**
    - **Languages:** Python (Expert), Pine Script (Expert).
    - **Technologies:** Proficient with the core Python data science ecosystem (Pandas, NumPy, Scikit-learn), backtesting frameworks, and core database concepts.
- **Foundational Expertise:**
    - **Modeling Emergent Systems & Novelty:** A first-principles understanding of creative workflows and emergent behavior, developed over 30 years of architecting complex interactive and generative systems.
    - **Cognitive Science:** Deep expertise in modeling subjective human states, grounded in over 25 years of leading competitively-funded research.