Stefano Blando

+39 3926569242 — stefano.blando@gmail.com — LinkedIn — GitHub — stefanoblando.github.io

Profile — PhD Candidate in Artificial Intelligence within the National PhD Program (SSSA & UniPi). Research concentrates on complex systems and high-dimensional socio-economic networks, with the goal of developing interpretable models for real-world impact.

Education

PhD in Artificial Intelligence *Nov 2025 – Present*
National PhD Program – Scuola Superiore Sant'Anna & University of Pisa
Research focus: Complex systems, high-dimensional socio-economic networks, machine learning, computational methods, and agent-based simulations.

II-Level Master in Customer Experience, Statistics, ML and AI *Feb 2025 – Sep 2025*
University of Rome Tor Vergata + SAS Academy
Thesis: "Network Topology Analysis and Machine Learning Techniques for Systemic Risk Prediction in U.S. Equity Markets"
Advanced program in data science, machine learning, and artificial intelligence with SAS Academic Specialization in Advanced Data Analytics and Machine Learning Engineering.

MSc in Financial Markets and Financial Intermediaries *Oct 2022 – Apr 2025*
University of Rome Tor Vergata, School of Economics and Finance
Final Grade: 108/110
Thesis: "High-dimensional Robust Portfolio Optimization Under Sparse Contamination: A Factor-Analytic Approach"
Supervisor: Prof. Alessio Farcomeni

BSc in Governance and International Relations *Sep 2019 – Sep 2022*
University of Rome Tor Vergata, School of Law
Final Grade: 110/110 cum laude
Thesis: "Consumer Choice Under Uncertainty: From Homo Oeconomicus to Homo Temperatus"

Erasmus+ Exchange: University of Paris Est-Créteil, France *Aug 2021 – Feb 2022*
Courses: Trade Data Analysis (30/30), Sustainable Development (30/30 with honours), Business and AI (30/30), International Strategy (30/30)

BA in Philosophy *Sep 2015 – Sep 2017*
La Sapienza University of Rome
Foundational studies in logic, epistemology, and analytical philosophy. Program paused for personal reasons.

Research Experience

Working Papers & Submissions

- **"Multi-Method Triangulation for Large-Scale Multilingual Text Analytics"** (Draft) – Methodological framework validating 18 analytical approaches (BERT, LDA, GNN) on 1M+ texts to ensure cross-platform stability.
- **"Network Topology Analysis for Systemic Risk Prediction"** – Application of Dynamic Correlation Networks and Graph Neural Networks (GraphSAGE) to predict market crashes and volatility spillovers.
- **"High-dimensional Robust Portfolio Optimization Under Contamination"** – Development of novel robust estimators (PFSE, SSRE) implemented via custom R code for sparse contamination scenarios.
- **"The BADGER Index: Rethinking GDP Measurement"** (Submitted to Rethinking Economics) – Proposal for a multidimensional macroeconomic indicator extending beyond standard GDP metrics.
- **"Russell's Paradox and Set Theory Foundations"** (Draft) – Theoretical analysis of mathematical logic foundations and their implications for formal systems.

Selected Projects

- **Psychometric Profiling via Clustering (SAS):** Application of advanced clustering algorithms to environmental sustainability survey data for behavioral segmentation (with Prof. F. Camillo).
- **Credit Risk Analysis (SACE):** Project on export credit risk assessment and political risk methodologies.
- **International Monetary Policy (ECB):** Intensive training on post-pandemic monetary transmission mechanisms with ECB Lead Economists.

International Experience & Professional Development

- **Workshop in Economic Complexity** - Enrico Fermi Research Center, Rome, July 2025
  Advanced methodologies in complexity economics and network analysis
- **Oxford Summer School in Economic Networks** - University of Oxford, June 2025
  Leading researchers including Doyne Farmer, Rama Cont, Aaron Clauset, Renaud Lambiotte, with lectures and coding tutorials in network formation theory and complex systems applications
- **YERUN Summer School in AI-Empowered Management Consulting** - Blended Intensive Program (Erasmus+)
  Collaborative project with students from Spain, Germany, UK, and Norway on AI applications in strategic business diversification and consulting methodologies
- **Erasmus+ Exchange:** University of Paris Est-Créteil, France - 6-month program focusing on Business Intelligence, AI, and International Strategy, advanced computational methods and data analysis
- **Extensive European Travel:** 13 countries across Europe - demonstrated cultural adaptability and international perspective

Academic Distinctions & Competitions

- **2nd Place, AI Data Hackathon 2024:** Developed predictive model for gas leak detection using CTGAN data augmentation and SHAP explainability
- **Finalist, Alpine Climate Data Challenge 2025:** Selected among 150+ teams for climate forecasting with Copernicus ECMWF, NOAA, and Arpa Piemonte datasets
- **1st Place, Huawei DigitALL Night 2024:** Quiz competition demonstrating digital technology expertise
- **Selected, Bertelsmann Next Gen Tech Booster:** Chosen from 17,000+ candidates for Generative AI nanodegree with Udacity
- **Two Academic Tutorship Awards:** University of Rome Tor Vergata (Data Processing Center and Supply Chain Management course support)

Professional Experience

Academic Tutor, University of Rome Tor Vergata *Mar 2020 – Jan 2025*

- Provided individual academic support and guidance to students at Data Processing Center and University Library
- Collaborated with Sustainable Supply Chain and Operations Management course, enhancing teaching and communication skills
- Supervised student projects and provided statistical consulting support, including study planning and course selection guidance

Insurance Administrative Assistant, UnipolSai Frascati *Jun 2022 – Sep 2022*

- Managed underwriting processes, policy documentation, and risk assessment procedures
- Gained practical experience in insurance industry operations and regulatory compliance
- Developed analytical skills in risk evaluation and financial product assessment

Leadership & Extracurricular Activities

Secretary General, Starting Finance Club Tor Vergata *2023 – 2024*

- Coordinated team of 70+ members and organized 10+ events including workshops, talks, and presentations with financial sector professionals
- Led macroeconomic and sectoral analysis initiatives, demonstrating leadership and organizational capabilities
- Facilitated collaboration with Deltahedge for financial analysis and outlook development, coordinated visit to Google EMEA HQ Dublin for networking and technology exposure

Mentoring & Community Engagement

- **Mentors4U Program:** Participated as mentee in professional development and mentoring activities, contributing to personal and professional growth

Technical Projects

TIM Big Data Lab Project ***Jun 2025***

- Developed listwise ranking recommendation system using LightGBM/XGBoost rankers with NDCG@K optimization
- Implemented behavioral profiling, ensemble weighting, and GroupKFold validation for improved recommendation accuracy

Advanced Income Classification - ML Project *Jun 2025*

- Comprehensive ML pipeline achieving 84% accuracy improvement using LightGBM with SMOTEENN sampling strategy
- Implemented advanced feature engineering (24 new features), Bayesian hyperparameter optimization (248 model configurations), and weighted ensemble methods (F1: 0.708)
- Applied class imbalance handling with SHAP interpretability, achieving F1-Score: 0.67, ROC-AUC: 0.91

Deep Learning Applications *May 2025*

- Implemented CNN image classification with advanced architectures and data augmentation techniques
- Developed Transformer models with self-attention mechanisms and positional encoding for sequence processing
- Built sequence-to-sequence encoder-decoder architectures for complex sequential data analysis

Cluster Analysis - Survey Dataset *May 2025*

- Performed comprehensive customer segmentation using K-means clustering, Ward hierarchical clustering, and density-based DBSCAN
- Applied PCA dimensionality reduction and silhouette analysis for cluster validation and optimization

Advanced Statistical Analysis of Multiple Datasets *May 2025*

- **Titanic Survival Analysis:** Applied Firth logistic regression with bootstrap validation for 2,201 passengers, handling quasi-complete separation
- **Copenhagen Housing Satisfaction:** Implemented ordinal regression and Bayesian MCMC for 1,681 residents with policy simulation framework
- **Florida Real Estate Prediction:** Developed robust pricing model with spline regression, achieving R^2 0.85 and MAPE 9.8% after outlier treatment
- **Doctor–Patient Factor Analysis:** Extracted bidimensional structure from 80 patient evaluations using multiple rotation techniques ($\alpha > 0.89$)

Text Mining & Sentiment Analysis *Feb 2025*

- Developed comprehensive NLP pipeline on IMDb movie reviews dataset with advanced preprocessing and tokenization
- Implemented TF-IDF vectorization, sentiment classification algorithms, and Latent Dirichlet Allocation topic modeling
- Achieved high accuracy in sentiment prediction with interpretable feature extraction and model validation

AI Photo Editor: SAM & Stable Diffusion *2025*

- Developed an advanced image editing application integrating Meta's Segment Anything Model (SAM) for precise object segmentation and Stable Diffusion XL for generative inpainting, enabling interactive object removal and background replacement.

Custom RAG Chatbot System *2025*

- Engineered an intelligent chatbot system combining Large Language Models with Retrieval-Augmented Generation (RAG) to integrate external knowledge bases, ensuring accurate domain-specific responses and reduced hallucinations.

Parameter-Efficient LLM Fine-Tuning *2024*

- Implemented LoRA and QLoRA optimization techniques, achieving 84% accuracy improvement while training only 0.23% of total parameters and demonstrating a 12% memory footprint reduction compared to full fine-tuning.

Robust Portfolio Optimization Framework *2024 – 2025*

- Developed Parallel Factor Space Estimator (PFSE) and Sequential Screening Robust Estimator (SSRE) for high-dimensional covariance estimation under sparse contamination
- Implemented comprehensive simulation study, empirical validation on S&P 500 data, and stress testing framework for robust performance evaluation

– Created interactive Shiny dashboard with Monte Carlo simulation capabilities for result exploration and validation

Gas Network Risk Forecasting – Hera Group Hackathon (2nd Place) *Nov 2024*

– Developed hybrid ML pipeline combining regression and classification for gas leak prediction with geospatial feature engineering
– Implemented GAN-based synthetic data generation (CTGAN, TimeGAN) improving minority class recall by 22% and ensemble modeling with SHAP interpretability
– Integrated geospatial, temporal, and operational features for infrastructure safety optimization and predictive maintenance strategies

Big Data Analytics Projects (R) *2023*

– **News Popularity Prediction:** Implemented Random Forest, Neural Networks, KNN for classification and OLS, Ridge, Lasso, Elastic Net for regression on news virality prediction
– **Voting Patterns Clustering:** Applied PCA dimensionality reduction and K-means/trimmed K-means clustering for electoral analysis with demographic segmentation

Salary Determinants Analysis (MATLAB) *2023*

– Analyzed wage inequalities using INAPP Labor Force Survey data with regression analysis across education, geography, and demographic variables.

Financial Time Series Forecasting (MATLAB) *2023*

– Applied ARIMA, ARCH, GARCH, and EWMA models to GDP growth modeling and S&P 500 volatility analysis with comparative forecasting methodologies.

Professional Development & Certifications

SAS Certifications: SAS Base Programming, Interactive Machine Learning, SAS Viya, Text Analytics, Programming 1 & 2
Advanced Quantitative Finance: ARPM Quant Bootcamp, Bloomberg Market Concepts & ESG & Finance, Financial Engineering Masterclass (Starting Finance)
Business & Strategy: McKinsey Forward Program, Candriam Academy (ESG, Circular Economy, Climate Change)
Technical Skills: 365 Data Science (Python, SQL, Advanced Excel, Statistics), MathWorks ML & DL Onramp
Specialized Training: ECB Monetary Policy (20 hrs with Lead Economist), Time Series Symposium Villa Mondragone, SACE Credit Risk Analysis, Sustainable Finance and Investments Workshop, Quantitative Finance at Work (2 editions), Storytelling Workshop, Bloomberg Workshops (Discover Bloomberg, Bloomberg Horizon)

Technical Skills

Programming R, Python, MATLAB, SAS, SQL, Git, LaTeX, Shiny
Statistics Robust Methods, Time Series, Econometrics, Multivariate Analysis, Bayesian Analysis
Machine Learning Supervised (Random Forest, Neural Networks, KNN, Regularization), Unsupervised (K-means, PCA, FA), Deep Learning, GANs, PEFT, SHAP, EDA, Data Visualization
Finance Portfolio Optimization, Risk Management, Asset Pricing, Financial Engineering
Economics Microeconomics, Game Theory, Information Economics, Network Theory, Complex Systems
Tools Bloomberg Terminal, Refinitiv Eikon, SAS, Office 365, Power BI, Advanced Excel

Languages

Italian (Native), English (C1), French (B1), Spanish (A2), German (A1)