Pasquale De Rosa

Ph.D. Candidate in Computer Science at University of Neuchâtel

Email GitHub LinkedIn Website

Personal Statement

I am a Ph.D. candidate in Computer Science at the University of Neuchâtel, specializing in machine learning for secure and efficient blockchain systems. My current research focuses on malware detection in smart contracts via bytecode analysis. Previously, I explored trend correlations in cryptocurrency markets using time series forecasting models. With a multidisciplinary background and two years of industry experience in a top-tier consulting firm, I adapt quickly to diverse challenges and dynamic research environments.

Employment History

2022 – present

Ph.D. Candidate and Teaching Assistant, University of Neuchâtel
Neuchâtel, Switzerland

- Development of PhishingHook, the first machine learning-based phishing detection framework for smart contracts at the bytecode level, leveraging LLMs, vision transformers, and traditional classifiers. Accepted for publication in DSN'25.
- Analysis of trend correlations and causality in cryptocurrency markets, focusing on price relationships across major cryptocoins (*e.g.*, Bitcoin, Ether, Litecoin). Application of state-of-the-art time series forecasting models to predict crypto price trends based on correlation patterns. Published in DAIS'22, DEBS'23, SoftwareX'24.
- Performance assessment of open source machine learning model serving frameworks. Analysis of the costs and latencies associated to each platform. Published in IC2E'24.
- Mitigation of bias with regard to sensitive attributes in federated learning. Development of Astral, a new model aggregation approach that constrains the bias below a given threshold while preserving the accuracy. Published in IMWUT'23.
- Teaching assistant for the following courses: Introduction to Python Programming, Languages and Compilers, Statistical Learning with R, Digital Humanities.

2020 – 2022

Research Scientist, University of Geneva
Geneva, Switzerland

- Analysis and modeling of acceleration time series data from horse racing gaits using high-performance sensors.
- Use of machine learning techniques to recognize the horses from their accelerations and to detect anomalies in their gait.
- Deploy of an end-to-end service to recognize horses and detect anomalies using Torchserve.

Employment History (continued)

2018 – 2020 **Business Analyst, Accenture**
Milan, Italy

- Definition of omnichannel attribution models based on machine learning techniques.
- Search engine optimization (SEO) for top-tier international client companies in automotive, FMCG, pharmaceutical and financial services.

Education

2022 – present **Ph.D. in Computer Science, University of Neuchâtel**
Neuchâtel, Switzerland
Expected graduation: 2025
Thesis advisors: Prof. Pascal Felber and Prof. Valerio Schiavoni.
Research topics: Malware detection in smart contract bytecode; trend correlations and causality in cryptocurrency markets; performance evaluation of machine learning model serving frameworks; bias mitigation in federated learning.

2016 – 2018 **M.Sc. in Economics, Luiss Guido Carli University**
Rome, Italy
Graduated summa cum laude.
Concentration: Marketing Analytics and Metrics.
Thesis title: *Collaborative recommendation systems with Deep Learning*.
Core topics: Machine Learning; Statistics; Big Data Analysis; Programming; Decision Theory; Behavioral Economics.

2013 – 2016 **B.Sc. in Economics, Luiss Guido Carli University**
Rome, Italy
Thesis title: *A multiple regression analysis of Private Labels imitating National Brands*.
Core topics: Mathematics; Statistics; Econometrics; Game Theory; Financial Mathematics; Microeconomics; Macroeconomics.

Research Publications

1. P. De Rosa, S. Queyrut, Y.-D. Bromberg, P. Felber, and V. Schiavoni, "Phishinghook: Catching phishing ethereum smart contracts leveraging evm opcodes," in *55th IEEE/IFIP International Conference on Dependable Systems and Networks (DSN)*, Accepted for publication on 2025-03-19, Naples, Italy: Institute of Electrical and Electronics Engineers (IEEE), Jun. 2025.
2. P. De Rosa, Y.-D. Bromberg, P. Felber, D. Mvondo, and V. Schiavoni, "On the cost of model-serving frameworks: An experimental evaluation," in *12th IEEE International Conference on Cloud Engineering (IC2E)*, Paphos, Cyprus: Institute of Electrical and Electronics Engineers (IEEE), Sep. 2024, pp. 221–232. DOI: 10.1109/IC2E61754.2024.00032.
3. P. De Rosa, P. Felber, and V. Schiavoni, "Cryptoanalytics: Cryptocoins price forecasting with machine learning techniques," *SoftwareX*, vol. 26, Feb. 2024. DOI: 10.1016/j.softx.2024.101663.
4. Y. Djebrouni, N. Benarba, O. Touat, P. De Rosa, S. Bouchenak, A. Bonifati, P. Felber, V. Marangozova, and V. Schiavoni, "Bias mitigation in federated learning for edge computing," *Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies*, vol. 7, no. 4, Jan. 2024. DOI: 10.1145/3631455.

5 P. De Rosa, P. Felber, and V. Schiavoni, "Practical forecasting of cryptocoins timeseries using correlation patterns," in *17th ACM International Conference on Distributed and Event-Based Systems (DEBS)*, Neuchâtel, Switzerland: Association for Computing Machinery (ACM), 2023, pp. 80–90. DOI: 10.1145/3583678.3596888.

6 P. De Rosa, M. Deriaz, M. De Marco, and L. Laura, "Service recommendations with deep learning: A study on neural collaborative engines," *Pacific Asia Journal of the Association for Information Systems*, vol. 14, 2 Feb. 2022. DOI: 10.17705/1pais.14205.

7 P. De Rosa and V. Schiavoni, "Understanding cryptocoins trends correlations," in *22nd IFIP International Conference on Distributed Applications and Interoperable Systems (DAIS)*, Lucca, Italy: Springer, 2022, pp. 29–36. DOI: 10.1007/978-3-031-16092-9_3.

8 G. L. Cascio Rizzo, M. De Marco, P. De Rosa, and L. Laura, "Collaborative recommendations with deep feed-forward networks: An approach to service personalization," in *10th International Conference on Exploring Services Science (IESS)*, Porto, Portugal: Springer, 2020, pp. 65–78. DOI: 10.1007/978-3-030-38724-2_5.

Skills

Languages	Italian (C2), English (C1), French (B1).
Programming	Python, C, R, Solidity.
Scientific Computing	Deep Learning (PyTorch, TensorFlow), Machine Learning (Scikit-learn, XGBoost, CatBoost, LightGBM, NumPy, Pandas), Graphs & Networks (PyTorch Geometric, NetworkX, Graphviz), Compilers & Parsers (Lex, Yacc, ANTLR), Smart Contracts (EVM, WebAssembly).
Deployment & MLOps	Django, TensorFlow Serving, TorchServe, MLflow, MLServer, BentoML.
Databases	SQL, Neo4j.
Operating Systems	UNIX-like, Linux.
Writing & Editing	LaTeX, Emacs, Vim.

Links

Google Scholar	https://scholar.google.com/citations?user=F2dY2VEAAAAJ
Scopus	https://www.scopus.com/authid/detail.uri?authorId=57889374500
ORCID	https://orcid.org/0000-0001-9726-7075
ResearchGate	https://www.researchgate.net/profile/Pasquale-De-Rosa
dblp	https://dblp.org/pid/257/0398.html