Leonardo Peroni

https://leonardoperoni.com/ www.linkedin.com/in/leonardo-peroni
https://github.com/Leo-rojo leonardo.peroni92@gmail.com
+34 634454714

I focus on video streaming systems, aiming to integrate machine learning methodologies to improve *networking performance* and enhance the *quality of experience*, with an emphasis on the data science aspects.

Professional Experience

Research assistant Mar. 2020 – Sep. 2024
IMDEA Networks Institute *Madrid Spain*

- Video streaming. (1) Implemented a real framework for generating personalized QoE models. (2) Analyzed, compared, and implemented QoE models from the literature. (3) Conducted crowdsourced subjective assessments. (4) Generated, analyzed, and interpreted video QoE datasets. (5) Measured and evaluated the impact of influence factors on QoE. (6) Implemented and compared ABR algorithms from the literature in both simulation and emulation. (7) Experimented with and compared different codecs
- ML. (1) Implemented, evaluated, and compared off-the-shelf algorithms, such as SVM, RF, XGBoost, CNN, and LSTM, as well as custom algorithms, across different learning paradigms including supervised, active, and reinforcement learning.
- Contributed to drafting the proposal for a European project related to immersive multimedia.

Technology consultant Sep. 2018 – Feb. 2020
Hesplora s.r.l. *Florence Italy*

- Contributed to the Acqua4.0 project to support the development of infrastructure for monitoring and predicting pipeline loss risks in Tuscany. (1) Developed custom risk metrics by integrating insights from experts across various fields with historical ground truth data. (2) Processed, analyzed, and managed diverse unstructured datasets, including DEM, lithology, and SAR interferometry. (3) Applied unsupervised learning techniques such as k-means, DBSCAN, and PCA.
- Contributed to the Apollon project to support the development of infrastructure for monitoring environmental pollution in Apulia. (1) Assisted in implementing a cloud-based IoT platform for managing indoor pollution monitoring devices using AWS IoT Core. (2) Processed and managed device data in JSON format via HTTP calls, utilizing AWS Lambda and DynamoDB services.
- Contributed to process mining projects by analyzing, modeling, and identifying bottlenecks in business processes across various sectors, primarily using process discovery tools and statistical analysis.
- Supported the IT department of the Italian Postal Service by conducting quantitative analysis, visualizing, and managing physical asset data, primarily using spreadsheets and VB macros for task automation.

Education

University Carlos III of Madrid Nov. 2020 – Feb. 2025 (expected)
Ph.D., Telematic Engineering *Madrid Spain*
Provisional thesis title: User Empowerment in Adaptive Video Streaming over Best-Effort Networks

Polytechnic University of Turin Oct. 2015 – Apr. 2018
M.Sc., Mechatronic Engineering *Turin Italy - 110L/110*
Thesis: Machine learning framework for classification of mild cognitive impairment and high resolution multispectral-multitemporal satellite images

The Sapienza University of Rome Sep. 2011 – May. 2015
B.Sc., Informatic and Automatic Engineering *Rome Italy - 110L/110*
Thesis: Lab-on-chip integrated systems for thermal control in biomolecular analysis

Journal Publications

[2] **L. Peroni** and, S. Gorinsky **"An End-to-End Pipeline Perspective on Video Streaming in Best-Effort Networks: A Survey and Tutorial"**, *arXiv*, preprint arXiv:2403.05192, September 2024 *(Under submission to a journal)*

[1] **L. Peroni**, S. Gorinsky, F. Tashtarian, and C. Timmerer, **"Empowerment of Atypical Viewers via Low-Effort Personalized Modeling of Video Streaming Quality"**, *Proceedings of the ACM on Networking*, 1(CoNEXT3), pp. 1-27, December 2023

Conference Publications

[4] **L. Peroni**, S. Gorinsky, and F. Tashtarian, **"In-Band Quality Notification from Users to ISPs"**, *IEEE CloudNet 2024*, pp. 332-338, Rio de Janeiro, Brazil, November 2024

[3] **L. Peroni** and S. Gorinsky, **"Quality of Experience in Video Streaming: Status Quo, Pitfalls, and Guidelines"**, *COMSNETS 2024*, pp. 1-10, Bengaluru, India, January 2024

[2] **L. Peroni**, S. Gorinsky, F. Tashtarian, and C. Timmerer, **"Empowerment of Atypical Viewers via Low-Effort Personalized Modeling of Video Streaming Quality"**, *ACM CoNEXT 2023* (published as journal article [1] in the Proceedings of the ACM on Networking), pp. 1-27, Paris, France, December 2023

[1] A. Khaliq, **L. Peroni**, and M. Chiaberge, **"Land cover and crop classification using multi-temporal sentinel-2 images based on crops phenological cycle"**, *IEEE EESMS 2018*, pp. 1–5, Salerno, Italy, June 2018

International Experience

Visiting Research Student Mar. 2023 – Aug. 2023
Korea Advanced Institute of Science & Technology (KAIST) *Daejeon, South Korea*

Erasmus Extra UE Sep. 2016 – Feb. 2017
Beihang University *Beijing, China*

English 4 U PET certification Jul. 2010 – Jul. 2010
Sprachcaffe Languages Plus *Brighton, United Kingdom*

Awards & Honors

Available, Functional, and Reproduced ACM Artifact Badges Dec. 2023
for paper "Empowerment of Atypical Viewers via Low-Effort Personalized Modeling of Video Streaming Quality", among three papers selected for presentation in the artifacts session, *ACM CoNEXT 2023*

Talks

Empowerment of Atypical Viewers via Low-Effort Personalized Modeling of Video Streaming Quality Dec. 2023
Paris, France
ACM CoNext *Madrid, Spain*
IMDEA-UC3M Research Seminar Series

Video-streaming research: an end-to-end pipeline perspective Dec. 2021
IMDEA-UC3M Research Seminar Series *Madrid, Spain*

Grants

SIGCOMM Travel Grant Aug. 2022
SIGCOMM *Amsterdam, Netherlands*

Professional Activities

ACM MM Oct. 2024
Reviewer, Melbourne Convention and Exhibition Centre *Melbourne, Australia*
IEEE SECON Sep. 2023
Volunteer, University Carlos III of Madrid *Madrid, Spain*
IEEE ICNP Oct. 2020
Volunteer, IMDEA Networks Institute *Madrid, Spain*

Language Skills

Italian: mother tongue, **English:** very good, **Spanish:** very good, **Chinese:** very basic

Computer Skills

Programming languages: Python, JavaScript, Matlab & Simulink, Java, SQL
Video tools: FFmpeg, GPAC, dash.js
Video compression standards: AVC, HEVC, LCEVC
Protocols: MPEG-DASH, WebRTC, QUIC, RTMP, HTTP, TCP
Python ML/DL libraries: Tensorflow, Keras, Scikit-learn, Pytorch
AWS Platform: EC2, IoT Core, Lambda, Dynamo db, MTurk, DeepLens, Rekognition
Geospatial data analysis tools: Qgis, Snap
Process mining tools: Disco, Apromore, Prom
Others: Git, Wireshark, Gurobi