

# Leonardo Peroni

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I focus on video streaming systems, aiming to integrate machine learning methodologies to improve *networking performance* and enhance the *quality of experience*, with a particular emphasis on data analysis, statistical methods, and human-centered insights.

## Professional Experience

### Research assistant

Mar. 2020 – Aug. 2024

IMDEA Networks Institute

Madrid Spain

- Worked extensively in video streaming by (1) developing a framework for personalized QoE models, (2) implementing a mechanism for communicating stall duration from users to ISPs, (3) analyzing and implementing QoE models, (4) conducting crowdsourced subjective assessments, (5) generating and analyzing QoE datasets, (6) implementing and comparing ABR algorithms in simulation and emulation, and (7) experimenting with various codecs.
- Worked extensively with machine learning by implementing, evaluating, and comparing 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.
- Assisted in drafting a European project proposal on immersive multimedia.

### Technology consultant

Sep. 2018 – Feb. 2020

Hesplora s.r.l.

Florence Italy

- Contributed to the Acqua4.0 project, enhancing pipeline loss risk prediction in Tuscany by (1) creating custom risk metrics through expert insights and historical data, (2) processing diverse unstructured data (DEM, lithology, SAR interferometry), and (3) applying unsupervised learning techniques like k-means, DBSCAN, and PCA.
- Contributed to the Apollon project on environmental pollution monitoring in Apulia, assisting in (1) implementing a cloud-based IoT platform for indoor pollution tracking with AWS IoT Core, and (2) processing and storing device data in JSON format via HTTP, using AWS Lambda and DynamoDB.
- Contributed to process mining projects by analyzing, modeling, and identifying bottlenecks in business processes across various sectors, 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, 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

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- [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

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- [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 Experiences

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<b>Visiting Research Student</b> <i>Korea Advanced Institute of Science &amp; Technology (KAIST)</i>	Mar. 2023 – Aug. 2023 <i>Daejeon, South Korea</i>
<b>Erasmus Extra UE</b> <i>Beihang University</i>	Sep. 2016 – Feb. 2017 <i>Beijing, China</i>
<b>English 4 U PET certification</b> <i>Sprachcaffe Languages Plus</i>	Jul. 2010 – Jul. 2010 <i>Brighton, United Kingdom</i>

## Awards & Honors

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<b>Available, Functional, and Reproduced ACM Artifact Badges</b> 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, <i>ACM CoNEXT 2023</i>	Dec. 2023
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## Talks

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<b>Empowerment of Atypical Viewers via Low-Effort Personalized Modeling of Video Streaming Quality</b> <i>ACM CoNext</i> <i>IMDEA-UC3M Research Seminar Series</i>	Dec. 2023 <i>Paris, France</i> <i>Madrid, Spain</i>
<b>Video-streaming research: an end-to-end pipeline perspective</b> <i>IMDEA-UC3M Research Seminar Series</i>	Dec. 2021 <i>Madrid, Spain</i>

## Grants

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<b>SIGCOMM Travel Grant</b> <i>SIGCOMM</i>	Aug. 2022 <i>Amsterdam, Netherlands</i>
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## Professional Activities

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### ACM MM

Reviewer, Melbourne Convention and Exhibition Centre

Oct. 2024  
Melbourne, Australia

### IEEE SECON

Volunteer, University Carlos III of Madrid

Sep. 2023  
Madrid, Spain

### IEEE ICNP

Volunteer, IMDEA Networks Institute

Oct. 2020  
Madrid, Spain

## Language Skills

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

## Computer Skills

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**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