

Andre Felipe Zanella

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SUMMARY

I'm a research Scientist working on data pipelines and ML models applied to large-scale production systems. I'm interested in solving complex data problems focusing on computational efficiency, fairness and sustainability. I also enjoy working on multi-disciplinary projects, creating solutions that not only benefit business, but also can be leveraged for societal improvement.

EXPERIENCE

Telefónica Innovación Digital (Barcelona, Spain) | Research Scientist Nov 2024 - present

- I work on creating data pipelines and ML tools towards the optimization and sustainability of networks and distributed systems, resulting in research papers, tech transfers and patents. My projects involve FL applied to mobile networks, specifically towards energy consumption and mobility events.

IMDEA Networks (Madrid, Spain) | Research Assistant Mar 2021 - Sep 2024

- I worked collecting and processing large-scale mobile networks measurements to study network and social dynamics. As a Marie Skłodowska-Curie fellow, I collaborated closely with industry partners, publishing in top-tier IEEE/ACM venues.

Cisco ThousandEyes (Madrid, Spain) | PhD Intern May 2024 - Aug 2024

- Developed new heuristics to characterize QoE metrics from encrypted packets of video conferencing applications for a commercial product. My work resulted in one publication and a patent under submission.

University of Cambridge (Cambridge, UK) | Visiting PhD Researcher Dec 2022 - Dec 2023

- Performed research in characterizing and modeling indoor telco systems. Worked with undergrad students as a Digital Electronics lab assistant.

Orange Innovation (Paris, France) | Visiting PhD Researcher May 2022 - Oct 2022

- Developed new PySpark tools for 5G NSA measurements based on different data feeds from the network, currently in use by the research team. Performed behavioral modeling of flow-level traffic dynamics and synthetic data generation.

Positivo Tecnologia (Curitiba, Brazil) | Product and Data Analyst Jan 2018 - Oct 2020

- Worked in data-driven product development within the smartphones division, gathering multi-domain data to guide product roadmap and marketing strategies.

ExxonMobil (Curitiba, Brazil) | Internship Jan 2017 - Dec 2017

- Studied teams demands and developed tools inside the Microsoft SharePoint platform.

EDUCATION

PhD Degree - Telematics Engineering 2021 - 2024

Universidad Carlos III de Madrid (UC3M), Madrid, Spain. Supervisor: Dr. Marco Fiore

Thesis: Characterizing Large-Scale Mobile Traffic Measurements for Urban, Social and Networks Sciences

Master's Degree - Electrical Engineering 2019 - 2020

Universidade Federal do Paraná (UFPR), Brazil. Supervisor: Dr. Eduardo G. de Lima

Thesis: Behavioral Modeling of Radio Frequency Power Amplifiers Using the Group Method of Data Handling.

Bachelor's Degree - Electrical Engineering 2013 - 2018

Universidade Federal do Paraná (UFPR), Brazil. Supervisor: Dr. Eduardo G. de Lima

Thesis: Signal Decomposition Applied to Digital Predistortion of Dual-Band Power Amplifiers Based on Polynomial Functions.

TECHNICAL SKILLS

Programming and developing

- Python: 5+ years developing data processing, modeling and visualization tools, as well as scripts for managing data within the infrastructure. A few of the key libraries I've deeply familiar with:
 - Data processing and statistical analysis libraries: Pandas, NumPy, SciPy, scikit-learn.
 - ML and FL libraries: PyTorch, TensorFlow, Keras, Flower.
 - Data and web visualization tools: Matplotlib, Seaborn, Plotly, Dash.

- Spatial data analysis and visualization: Folium, Plotly, PySAL.
- Spark, Pyspark, SQL: 5+ years developing processing tools for industry and research applications.
- C: 3+ years developing code focused in embedded hardware.
- Matlab: 5+ years developing code for signal processing and data modeling, specially focused in telecommunications systems.

Systems

- Linux: 5+ years working with Ubuntu and Debian distributions, creating bash scripts and administrating users.
- Hadoop: 3+ years working with it in cooperation with Spark to performed distributed processing of large-scale datasets.
- Azure, AWS: 2+ years experience working with code deployed in cloud processing platforms.
- FPGA/VHDL: 2+ years developing and validating designs within the Xilinx ecosystem.

LANGUAGES

- English: Fluent
- Portuguese: Fluent
- Spanish: Advanced
- French: Intermediary

SELECTED PUBLICATIONS

A detailed list of my publications can be found on my Google Scholar

- [1] **A. F. Zanella**, D. Madariaga, S. Mishra, O. E. Martínez-Durive, Z. Smoreda, M. Fiore, "Characterizing, modeling and exploiting the mobile demand footprint of large public protests". In Proceedings of the 2024 ACM on Internet Measurement Conference (IMC '24). Association for Computing Machinery, Madrid, Spain - **CORE2023 A Rank**
- [2] **A. F. Zanella**, S. Rubrichi, Z. Smoreda and M. Fiore, " Modeling and understanding the impact of COVID-19 containment policies on mobile service consumption in French cities". EPJ Data Science, 13(1), 68.
- [3] **A. F. Zanella**, A. Bazco-Nogueras, C. Ziemlicki and M. Fiore, "Characterizing and Modeling Session-Level Mobile Traffic Demands from Large-Scale Measurements". In Proceedings of the 2023 ACM on Internet Measurement Conference (IMC '23). Association for Computing Machinery, New York, NY, USA, 696–709 - **CORE2023 A Rank**
- [4] **A. F. Zanella**, O. E. Martínez-Durive, S. Mishra, Z. Smoreda and M. Fiore, "Impact of Later-Stages COVID-19 Response Measures on Spatiotemporal Mobile Service Usage". IEEE INFOCOM 2022 - IEEE Conference on Computer Communications, London, United Kingdom, 2022, pp. 970-979 - **CORE2023 A* Rank**
- [5] J. Gamba, **A. F. Zanella**, R. Morla, K. Schomp, Á. Feal, A. Kakhki "Lost in Encryption: Monitoring Audio and Video Flows without Payload in Video-Conferencing Applications". In 1st Workshop on Next-Generation Network Observability (NGNO) (SIGCOMM'25 Workshop)
- [6] S. Mishra, **A. F. Zanella**, O. E. Martínez-Durive, D. Madariaga, C. Ziemlicki and M. Fiore, "Characterizing 5G Adoption and its Impact on Network Traffic and Mobile Service Consumption". IEEE INFOCOM 2024 - **CORE2023 A* Rank**