ESTEBAN BAUTISTA RUIZ

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PERSONAL INFORMATION

Date of birth	July 7, 1989
Citizenship	Mexican
Languages	Spanish (native), English (fluent), French (fluent)

EDUCATION

PhD in Computer Science (Machine Learning on Graphs) November 2019
École Normale Supérieure de Lyon *Lyon, France*
- Thesis: "Laplacian Powers for Graph-Based Semi-Supervised Learning" (link)
- Advisors: Paulo Gonçalves (INRIA, DR), Patrice Abry (CNRS, DR)

M.Eng. in Electrical Engineering (Signal Processing) (*with highest honors*) January 2016
Universidad Nacional Autónoma de México *Mexico City, Mexico*
- Thesis: "Compressive Sampling of Photoacoustic Tomography Signals" (link)

B.S. in Electrical and Electronics Engineering March 2014
Universidad Nacional Autónoma de México *Mexico City, Mexico*

RESEARCH EXPERIENCE

Postdoctoral Researcher March 2023 - Current
IMT Atlantique *Brest, France*
- I am studying anomalies in data of interactions over time: internet traffic, bank transfers, emails, etc.
- I am investigating interpretable measures of regularity / normality in such data
- I am developing new anomaly detection algorithms that leverage the data's frequency-structure signature

Postdoctoral Researcher January 2021 - December 2022
Sorbonne Université *Paris, France*
- Developed tools for the analysis of link streams: a mathematical model for data of interactions over time
- Proposed a novel Fourier-like decomposition by combining signal and graph methods.
- Extended several graph concepts through a principled analysis via categorical propositions
- Improved the complexity of methods for tracking the importance of vertices.
- Released Python libraries for link stream analysis

Doctoral Researcher September 2016 - November 2019
École Normale Supérieure de Lyon *Lyon, France*
- Addressed two cases where semi-supervised learning fails: unbalanced and poorly separated datasets
- Extended the PageRank algorithm to signed graphs to better classify poorly separated data
- Extended the PageRank algorithm to super-diffusive processes to better classify unbalanced data
- Used proposed methods to detect faulty routers on the internet *(best paper award)*

Visiting Researcher June 2019 - July 2019
École Polytechnique Fédérale de Lausanne *Lausanne, Switzerland*
- Addressed a limitation of semi-supervised learning: it adapts badly to evolving scenarios
- Proposed graph kernels and neural networks to update classification results

Intern May 2016 - July 2016
École Normale Supérieure de Lyon *Lyon, France*
- Classified medical data using graphs as a means to model their structure

Intern August 2014 - July 2015
Universidad Nacional Autónoma de México *Mexico City, Mexico*
- Used compressive sensing theory to efficiently acquire data from a tomography scanner

TEACHING EXPERIENCE

IMT Atlantique 2023 - Current
- Algorithmics and Discrete Mathematics (TP 25h)
- Anomaly Detection (TP 11h)
- Social Network Analysis (TP 6h)

Sorbonne Université 2021 - 2022
- Network Analysis and Mining (CM 14h, TP 14h)
- Network Mining Project (TD 10h)
- Python (TD 35h, TP 21h)
- Python Project (TD 3.5h, TP 38.5h)

École Supérieure de Chimie Physique Électronique de Lyon 2017 - 2019
- Signals and Linear Systems (TD 6h, TP 54h)
- Digital Signal Processing (TP 40h)
- Random Signal Processing (TP 12h)

LIST OF PUBLICATIONS

Journals

1. E. Bautista, M. Latapy, *"A Local Updating Algorithm for Personalized PageRank via Chebyshev Polynomials"*, Social Network Analysis and Mining, 2022.
2. E. Bautista, P. Abry, P. Gonçalves, *"L^γ-PageRank for Semi-Supervised Learning"*, Applied Network Science, vol. 4, no. 1, 2019.

International conferences

1. E. Bautista, L. Brisson, C. Bothorel, G. Smiths *"MAD: Multi-Scale Anomaly Detection in Link Streams"*, Accepted at The 17th ACM International Conference on Web Search and Data Mining (WSDM), 2024.
2. E. Bautista, M. Latapy, *"Link Streams as a Generalization of Time Series and Graphs"*, Accepted at The Fifth IEEE International Conference on Cognitive Machine Intelligence (COGMI), 2023.
3. N. Arhachoui, E. Bautista, M. Danisch, A. Giovanidis, *"A Fast Algorithm for Ranking Users by their Influence in Online Social Platforms"*, IEEE/ACM International Conference on Advances in Social Networks Analysis and Mining (ASONAM), Istanbul, Turkey, 2022.
4. R. Fontugne, E. Bautista, C. Petrie, Y. Nomura, P. Abry, P. Gonçalves, K. Fakuda, E. Aben *"BGP Zombies: an Analysis of Beacons Stuck Routes"*, in International Conference on Passive and Active Network Measurement, Springer, Cham, pp. 197-209, 2019. (***Best paper award***).
5. S. de Nigris, E. Bautista, P. Abry, K. Avrachenkov, P. Gonçalves, *"Fractional Graph-Based Semi-Supervised Learning"*, 2017 25th European Signal Processing Conference (EUSIPCO), pp. 356-360, 2017.

National conferences

1. E. Bautista, M. Latapy, *"A Frequency-Structure Decomposition for Link Streams"* in Proceedings of the 28th colloquium GRETSI, 2022.
2. E. Bautista, S. de Nigris, P. Abry, K. Avrachenkov, P. Gonçalves, *"Lévy Flights for Graph-Based Semi-Supervised Classification"*, in Proceedings of the 26th colloquium GRETSI, 2017.

International workshops

1. E. Bautista, M. Latapy, *"A Logical Approach for Temporal and Multiplex Networks Analysis"*, in 10th Inter- national Conference on Complex Networks and their Applications, Madrid (Spain), December 2021.
2. S. de Nigris, E. Bautista, P. Abry, K. Avrachenkov, P. Gonçalves, *"Fractional Graph-Based Semi-Supervised Learning"*, in International School and Conference on Network Science, Paris (France), June 2018.
3. E. Bautista, S. de Nigris, P. Abry, P. Gonçalves, *"L^2-based PageRank for Graph-Based Semi-Supervised Learning"*, in 3rd Graph Signal Processing Workshop, Lausanne (Switzerland), June 2018.

Book Chapters

1. E. Bautista, M. Latapy, *"A Frequency-Structure Approach for Link Stream Analysis"*, Temporal Network Theory, 2nd Edition, Springer Cham, 2023. (to appear)
2. N. Arhachoui, E. Bautista, M. Danisch, A. Giovanidis, L. Tabourier. *"Scalable Algorithms to Measure User Influence in Social Networks."*, Accepted in Lecture Notes in Social Networks, 2023.

SUPERVISION

Nouamane Arhachoui (Master 2 internship) *(paper published)* 2022
Subject: Fast Algorithms for Influence Measure in Temporal Networks

Bastien Guillemare (First year of engineering school) 2022
Subject: A C++ implementation of link stream decompositions

AWARDS, SCHOLARSHIPS, GRANTS

LIP6 Project Funding 2022
5360 euros awarded to hire an internship and cover travel expenses

Best Paper Award 2019
Awarded at the 20th Passive and Active Measurement Conference, Puerto Varas, Chile

GdR ISIS Doctoral Mobility Scholarship 2019
Awarded to a limited number of applicants to conduct research in a foreign laboratory

CONACyT - French Government PhD Scholarship 2016
40 scholarships awarded in Mexico to pursue doctoral studies in France

CONACyT Scholarship for Graduate Students 2013
Awarded to a group of graduate students in programs of academic excellence

OTHER ACADEMIC ACTIVITIES

Seminars

- A Frequency-Structure Decomposition for Link Streams, IIT, Athens (Greece), March 2022.
- A Frequency-Structure Decomposition for Link Streams, University of Bourgogne, Dijon (France), February 2022.
- A Frequency-Structure Decomposition for Link Streams, Paris Brain Institute, Paris (France), December 2021.
- A Frequency-Structure Decomposition for Link Streams, CAMS - EHESS, Paris (France), December 2021.
- Fractional Semi-Supervised Learning, UNAM, Mexico City (Mexico), February 2021
- L^γ-PageRank for Semi-Supervised Classification, LTS2 Seminar, EPFL, Lausanne (Switzerland), June 2019.

Academic Service

- Reviewer, Social Network Analysis and Mining Journal, Springer *2021 - Current*
- Reviewer, Advances in Social Networks Analysis and Mining Conference, IEEE/ACM *2021 - Current*
- Member, IEEE Signal Processing Society *2013 - 2019*
- Organizer, INRIA DANTE team seminar *2018 - 2019*
- Organizing committee, International Workshop on Dynamics on and of Networks *2018*
- Board member, IEEE-UNAM student branch *2012 - 2013*

TECHNICAL SKILLS

Programming Languages	Python, C/C++, Matlab, Bash, Awk
Modules and Libraries	PyTorch, NetworkX, Scikit-learn, Numpy, Scipy, Pandas, PyWavelets, GSL, Armadillo, BLAS, LAPACK, SuperLU, Accelerate framework
Software	LaTeX, Git, Vim, Cmake, LLDB, Gephi, MS Office

ACADEMIC REFERENCES

Matthieu Latapy	Sorbonne Université, France Matthieu.Latapy@lip6.fr https://www-complexnetworks.lip6.fr/ latapy/
Paulo Gonçalves	ENS Lyon, France paulo.goncalves@ens-lyon.fr http://perso.ens-lyon.fr/paulo.goncalves/
Patrice Abry	ENS Lyon, France patrice.abry@ens-lyon.fr http://perso.ens-lyon.fr/patrice.abry/
Romain Fontugne	Internet Initiative Japan Inc. romain@iij.ad.jp https://www.iij-ii.co.jp/en/members/romain.html