LUIZ MANELLA PEREIRA

Website: `https://solidlab.network/people`

EDUCATION

Ph.D. in Computer Science *January 2021 - Present*
Knight Foundation School of Computing and Information Science
Sustainability, **O**ptimization, and **L**earning for **I**nter**D**ependent networks laboratory (**solid** lab)
College of Engineering and Computing, Florida International University
Ph.D. Advisor: **Dr. M. Hadi Amini**
Ph.D. Dissertation Topic: Optimal Transport for Machine Learning: Theory and Applications

Bachelors of Science in Applied Mathematics *2018 - 2020*
College of Arts and Science, Florida International University
(Magna Cum Laude, Multiple Dean's List Award)

Bachelor of Business Administration in Finance *2013 - 2018*
Landon Undergraduate School, College of Business, Florida International University
(Wolds Ahead Graduate, Magna Cum Laude, Dean's High Achievers Society, BGS Honor Society, Multiple Dean's List Award)

HONORS AND RECOGNITION

1. 2021 Operations Research Forum (ORFO) Best Journal Paper Award - "Topological Data Analysis for Network Resilience Quantification"
2. Awarded DHS Fellowship through the *Center for Advancing Education and Studies on Critical Infrastructures Resilience* (CAESCIR)
3. **Undergradute Recognition and Awards:** Wolds Ahead Graduate, Magna Cum Laude Graduate, Dean's High Achievers Society, BGS Honor Society, Multiple Dean's List Award

HIGHLIGHTS

• Learning Assistant for the department of mathematics, teaching calculus and ordinary differential equations

• Contributed to developing a new course on *Applied Linear Structures for Computing*, which has been taught to 70+ students so far with a focus on putting theory and programming together

RESEARCH INTERESTS

• **Theoretical Machine Learning** (Optimal Transport, Information Geometry, Deep Learning, Distributed Machine Learning).

• **Robotics** (Computer Vision, Self-Supervised Learning, Multi-Agent Learning).

• **Applied Machine Learning and Data Mining** (Applied Regression and Classification, Data Analysis, Classical and Bayesian Inference).

SELECTED PROJECTS (DURING PHD)

Generalized Framework for Learning with a Wasserstein Loss: The goal of the project is to design a general framework where Wasserstein Distance can replace traditional loss functions in some learning environment. The nice inherent geometry of Wasserstein Distance may yield improvements during the learning process, such as dealing with vanishing (exploding) gradients and more.

Topological Data Analysis for Network Resilience: This project creates a general framework to study a network's resilience via the language of topological data analysis. It further led to a study on how different embeddings affect the quantification of resilience levels.

TECHNICAL STRENGTHS

Programming language	C, C++, Python, Javascript
Web Development	NodeJS, Electron, CSS, HTML, Django
Database Management Systems	SQL
Hardware tool	Raspberry Pi, Arduino
Other App	LATEX, Jupyter NoteBook, Git, Excel, VBA

WORK EXPERIENCE

Florida International University January 2019 - April 2019
Learning Assistant .

· Taught students of various academic levels Calculus and Ordinary Differential Equations

Man Numeric May 2019 - August 2019
Quantitative Research Intern .

· Performed quantitative analysis on alpha factors to improve energy sector models and sub-industry models. Researched, categorized, and back-tested 400 factors as part of an in-sample/out-of-sample research project.

SELECTED PUBLICATIONS (DURING PHD AT FIU:)

1. **Luiz Manella Pereira**, Luis Caicedo Torres, M. Hadi Amini, "Topological Data Analysis for Network Resilience Quantification", Springer Nature Operations Research Forum, Article 29, vol. 2, no. 2, pp.1-17, 2021.
2. Luis Caicedo Torres, **Luiz Manella Pereira**, M. Hadi Amini, "A Survey on Optimal Transport for Machine Learning: Theory and Applications", arXiv, 2021.
3. **Luiz Manella Pereira**, S.S. Iyengar, M. Hadi Amini, "On the Impact of the Embedding Process on Network Resilience Quantification", 2021 IEEE CPS - International Conference on Computational Science and Computational Intelligence

PROFESSIONAL ACTIVITIES (DURING PHD AT FIU)

Machine Learning Engineer: Working as lead machine learning engineer for FIU's Thrive project which will make use of various machine learning systems to drive a precision health-care mobile application.