Pierfrancesco Beneventano

PhD candidate at Princeton University

Researching on theory of deep learning.
Broadly interested in Machine Learning, its theory, and the math tools to develop it.
Advised by Prof. Boris Hanin and Prof. Jason D. Lee.

Personal Data

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Education

PhD in Operation Research and Financial Engineering, Princeton University, NJ, USA **2020 – curr.**
Mathematics of machine learning, Statistics, Computational Mathematics
Advisers: Prof. Boris Hanin and Prof. Jason D. Lee.

MSc in Mathematics, ETH Zurich, Switzerland **2018 – 2020**
Statistics, Probability, Computational Mathematics, and Deep Learning
Theses (now ArXiv preprints):
- Deep neural network approximations for high-dimensional functions.
- Deep neural network approximations for high-dimensional first order Kolmogorov PDEs.

Advisers: Prof. Arnulf Jentzen, Prof. Patrick Cheridito.

BSc in Mathematics, Università di Pisa, Italy **2015 – 2018**
Computational Mathematics Curriculum
- Thesis on numerical methods for Markov chains (Italian). **Supervisor:** Prof. Dario A. Bini.
- INdAM Merit Scholarship, best 40 freshmen in math all-over Italy (2015–2018).
- INdAM Summer School in Mathematics (2016, 2017).

Industry Experiences

Machine Learning Research Intern **2020**
Daedalean AI, Zurich, Switzerland
- *Explainability of AI.*
- *Theoretical Guarantees for Neural Networks (Generalizability).*

My work was part of the project Concepts of Design Assurance for Neural Networks (CoDANN) in partnership with EASA, European Union Aviation Safety Agency, which will lead to the first guidelines for *AI certification in safety critical system*.

Teaching Experiences

Princeton University:
- Energy and Commodities Markets.

Course mainly for Finance MSc and ORFE BSc. Taught the precepts, corrected exercises, held office hours.

ETH Zurich:
- Numerical Methods for Partial Differential Equations.
- Computational Methods in Engineering and Applications.
- Translator and Proofreader of a book on Calculus.

Courses for: Physics MSc, Data Science MSc, CSE BSc, Mech. Eng. BSc.

Coding skills

Proficient: *C, Matlab.*
Experiences: *Python, R.*

Other

Moderator & Organizer: XAI session, conference at OECD on *"Forecasting the future for sustainable development"* (and much more as CEST member).
Organizer, Moderator, & Panelist: CEST-UCL Seminar series on responsible modelling.