Pierfrancesco Beneventano

PhD candidate at Princeton University

Researching on theory of deep learning following up on my research at ETH Zurich.
Working on a research project on SGD optimization for over-parametrized systems.
Broadly interested in Machine Learning, its theory, and the math tools to develop it.

Personal Data

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Education

PhD in Operation Research and Financial Engineering, Princeton University, NJ, USA   **CGPA: na**
Mathematics of machine learning, Statistics, Computational Mathematics   *2020 – curr.*

MSc in Mathematics, ETH Zurich, Switzerland   **Final grade: 5.92/6 (summa cum laude)**
Statistics, Probability, Computational Mathematics, and Deep Learning   *2018 – 2020*

Theses:
o Deep neural network approximations for high-dimensional functions.
o Deep neural network approximations for high-dimensional first order Kolmogorov PDEs.
Supervisors: Prof. Arnulf Jentzen, Prof. Patrick Cheridito.

BSc in Mathematics, Università di Pisa, Italy   **Final grade: 110/110 summa cum laude**
Computational Mathematics Curriculum   *2015 – 2018*

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

Experiences

Daedalean AI, Zurich, Switzerland
Machine Learning Research Intern   *2020*

o *Explainability of AI.*
o *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.*

ETH Zurich, Switzerland
Teaching Assistant   *2019 - 2020*

o Computational Methods in Engineering and Applications.
o Numerical Methods for Partial Differential Equations.
o Translator and Proofreader of a book on Calculus.
Courses for, among others: Physics MSc, Data Science MSc, CSE BSc, Mech. Eng. BSc.
Taught at the exercise lectures of the courses (both theory and C++ for problems.)

Coding skills

Proficient: *C, Matlab, LaTeX.*

Experiences: *C++, Python, R, Java.*

Languages

Native: Italian.

Fluent: English, 7.5/9 Academic IELTS

Other activities

OECD, Paris, France.

Panel on Explainable AI, moderator and organizer. *Postponed, TBD. - 2020*
Organizing Committee Member. Conference: *"Forecasting the future for sustainable development: New Approaches to Modeling and the Science of Prediction"*.

Zurich, Switzerland

Student Project: Machine Learning in Finance *2020*
Developing DL algorithms to find optimal strategies in finance. Goal: infer the relevant economical factors in our problems.

Università di Pisa, Italy

Project: Algorithms and Data Structures *2017*
Coded a routing algorithm for openstreetmap. Programming language: C.

Selected Mathematical competitions
- Stats, 2015, 1st place at the Semifinal, 4th at the Final of Italian Statistics Olympiad.
- Math, 2013–2015, Finalist at the National Individual Competition.
- Math, Team Member (2013–2014) and Captain (2015) for the National Team Competition (ranked 4th-4th-3rd all-over Italy).
- Kangourou Math, 2012, 2014, and 2015, National finalist of the mathematical competition (scoring in the top 5 of my age for the first two years).

Other
- Intel® Edge AI Scholarship, Udacity.
- Attended several conferences on Complexity economics, Mathematics, Machine Learning.
- Soccer referee (AIA - FIGC, 2013 – 2016).