

DANIELE FAKHOURY

Data Scientist — Researcher — Lecturer

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SUMMARY: A CREATIVE PH.D. WITH MORE THAN 3 YEARS OF EXPERIENCE IN MATH AND DATA PROJECTS. READY TO FACE CHALLENGES, LEADING PROJECTS AND MANAGING RESPONSIBILITIES. *Languages:* ITALIAN, ENGLISH, ARABIC

EDUCATION

- May 2019 – Expected: Nov 2022 *University of Rome Tor Vergata* — Rome, Italy
PhD Applied Mathematics
Directed research in computational and mathematical aspects of **Machine/Deep Learning**^[1,2].
Thesis: ExSpliNet: a B-spline based Neural Network and its Approximation Power.
- Oct 2015 – May 2018 *University of Rome Tor Vergata* — Rome, Italy
Master Sc. Pure and Applied Mathematics (Cum Laude)
Computational Mathematics and Computer Science (**Java, Eiffel, SQL, Matlab, Python, Git**).
Thesis: Spline Subd Surfaces in Computer Graphics: Mathematical and Implementation Aspects.
- Jul/2016 - Sep/2016 *Lomonosov Moscow State University* — Moscow, Russia
Rome — Moscow school: Matrix Methods and Applied Linear Algebra
Attended and accomplished 5 courses on numerical and computational mathematics.
- Oct/2010 – Mar/2015 *University of Rome Tor Vergata* — Rome, Italy
Bachelor Sc. Pure Mathematics
Thesis: Analysis of the Lutz - Nagell Theorem: rational torsion points of elliptic curves over \mathbb{Z} .

WORK EXPERIENCE

- May 2019 – Sep 2022 *University of Rome Tor Vergata* — Rome, Italy/Toronto, Canada
Data Scientist, Researcher and Lecturer
 - Won 1 out of 4 prestigious and generous scholarships. Defined a novel neural network model.
 - Improved results attacking unbalanced datasets and engineering simulations tasks (PDEs). Dealt with image and text classification and regression tasks. Presented at national and international conferences.
 - Supervised master's thesis and lectured courses in **C programming, Geometry/Algebra, Calculus**. (**Python: TensorFlow, PyTorch, Numpy, Scipy, Scikit-Learn, Pandas, Matplotlib**) (**SVM, linear/logistic regression, random forest, k-NN, ... , CNN, RNN, FFNN, GAN**)
- Oct 2018 – Apr 2019 *Applied Research Team ART @ Central Bank of Italy* — Rome, Italy
Artificial Intelligence Researcher Intern
 - Won a public call and joined the scrum Vada group directed by Prof. G. Gottlob (**Oxford University**).
 - Improved accuracy of classification tasks, integrating business and domain knowledge in pipeline.
 - Implemented a mixed approach based on machine learning and reasoning in **Python, Vadalog**^[3].
- Oct 2016 – Apr 2017 *SinergieIT* — Rome, Italy
Software Engineer Intern
 - Addressed the main software life cycle phases in agile environment: from requirements analysis to test and documentation. (**WebRatio, Java, SQL, HTML, CSS, Git**)
- May 2012 – Apr 2014 *University of Rome Tor Vergata* — Rome, Italy
Info Desk and Assistant Secretary
 - Managed info point and Math Department secretary communicating details on enrollment and plans.
- Since 2008 *Rome, Italy*
Factotum, Tutor and Web Writer
 - During high school and first University year: waiter, barman, promoter, pizza delivery. Since 2011 successfully guided 100+ students with private lessons. In 2016 started redacting Math content online.

CONFERENCES AND PUBLICATIONS

- Conference on Mathematics of Data Science *SIAM* — San Diego, California, US
- Functional Analysis and Numerical Analysis *Università della Basilicata* — Matera, Italy
- Oberwolfach: Mathematics of Deep Learning *Banach Center* — Bedlewo, Poland
- [1] D. Fakhoury, H. Speleers. **On the expressivity of the ExSpliNet model.** *Under review*, 2022.
- [2] D. Fakhoury, E. Fakhoury, and H. Speleers. **ExSpliNet: An interpretable and expressive spline-based neural network.** *Neural Networks*, 152:332–346, 2022.
- [3] L. Bellomarini, D. Fakhoury, G. Gottlob, and E. Sallinger. **Knowledge graphs and enterprise AI: The promise of an enabling technology.** *In 2019 IEEE 35th Intern Conf on Data Eng*, 26–37. IEEE, 2019.