Ouail Kitouni

Ph.D. Candidate

Cambridge, MA 02139, USA
kitouni@mit.edu
okitouni.github.io
okitouni

Education

2019–Present **Massachusetts Institute of Technology**, *Ph.D. Candidate*, Physics, Statistics, and Data Science joint degree, Nuclear and Particle Experimental Physics Division and The MIT Statistics and Data Science Center

2017-2019 **University of Rochester**, *Bachelor of Science with Highest Distinction*, Physics *GPA: 4.00/4.00* /Mathematics *GPA: 4.00/4.00*

Experience

2024 **FAIR**, *Incoming Research Scientist Intern*, Meta AI - Fundamental AI Research, NYC

2023 Summer **MSR**, *Research Intern*, Microsoft Research, Cambridge UK

2022 Summer **FDL**, *ML Researcher Intern*, The NASA/SETI Frontier Development Lab

2021–Present **IAIFI**, *Junior Investigator*, The NSF AI Institute for Artificial Intelligence and Fundamental Interactions

2019–Present **LHCb**, *Ph.D. Researcher*, Large Hadron Collider, European Center for Nuclear Research (CERN)

2018–2019 **DESI**, *Undergraduate Researcher*, Dark Energy Spectroscopic Instrument Collaboration

Selected Publications

[1] *"NuCLR: Nuclear Co-Learned Representations"*, Synergy of Scientific & ML Modeling, **ICML2023**.

[2] *"Expressive Monotonic Networks"*, **ICLR 2023**.

[3] *"Towards Understanding Grokking: An Effective Theory of Representation Learning"*, **NeurIPS 2022 Oral**.

[4] *"NEEMo: Geometric Fitting using a **N**eural **E**stimation of the **E**nergy **Mo**ver's Distance"*, Machine Learning and the Physical Sciences **NeurIPS 2022**.

[5] *"Robust and Provably Monotonic Networks"*, ML and the Physical Sciences **NeurIPS 2021**.

[6] *"Controlling Classifier Bias with Moment Decomposition: a method to enhance searches for resonances"*, **Journal of High Energy Physics** 10.1007/JHEP04(2021)07 and the Workshop on Machine Learning and Physical Sciences **NeurIPS 2020**.

[7] *"Lower Bounds for the Laplacian Spectral Radius of an Oriented Hypergraph"*, **Australasian Journal of Combinatorics**. 74(3). 408-422.

[8] *'The Benefits of Lipschitz Networks"*, Submitted to Machine Learning: Science and Technology.

Honors and Awards

2019 **Frank Fellowship**, Awarded to a selection of incoming first-year doctoral students.

2017-2019 **Dean's List**, Awarded based on GPA

2017-2019 **Whipple Science and Research Scholarship**, Awarded based on academic and research excellence.

2018 **U of R Research Presentation Award**, For presenting excellent research at academic conferences.

2015-2017 **Dean's List**, Awarded based on GPA.

2017 **Bailey Scholarship**, Awarded to one outstanding student across the departments of physics, mathematics, chemistry, and biology.

2017 **Harvard House Award**, Awarded to top student in the Physics department.

2017 **Interdisciplinary Award**, Awarded to top student interested in interdisciplinary research in applied mathematics.

2015-2017 **Honors Scholarship**, Merit scholarship awarded to top incoming first-year students every fall semester.

2016-2017 **Integration Bee Gold Medal**, Competition at SUNY Brockport's Mathematics department (2016/2017).

2014 **Cirta-Science 1st Place**, High school science competition in Algeria.

Languages

Native Level **Arabic**, **French**, **English**