

Liam Toran

San Francisco, CA

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Profile

Self-motivated and driven person with experience in Research that wants to dive deep in the dynamic and challenging world of Data Science. Fluent in Python and Maths and a passion for learning new things.

Education

École Normale Supérieure de Lyon (ENS Lyon)

Lyon, France

Master's Degree in Applied Mathematics

2016-2018

- o Studied courses include advanced statistics and machine learning, numerical methods, statistical physics, stochastic calculus, dynamical evolution equations, harmonic fluid dynamics and the Boltzmann gaz equation.

Bachelor's Degree in Computer Science & Mathematics

2014-2016

- o Studied courses include Algorithms I & II, Data Structures, Logic, Programming and Junior level classes in Physics.
- o Entered ENS Lyon through top 0.5% ranking in nation-wide competitive exams.

Experience

J.A.Dieudonné Research Institute, Université de Nice Côte d'Azur

Nice, France

Research Assistant Intern, 6 months

2019

My work was centered on the modelization and simulation of Dynamical Branching Networks, for instance social media networks or fungus growth.

- o Learned about new models and uses of stochastic and partial differential equations in population dynamics.
- o Implemented state of the art numerical fluid simulation techniques through Python;
- o Solved the relationship between the physical parameters and the propagation speed for dynamical branching networks.

Knight Lab, Biomedical Research Institute of UCSD

San Diego, USA

Machine Learning Research Assistant Intern, 5 months

2017-2018

My focus was on analysing and understanding compositional microbiological datasets:

- o Implemented several compositional statistical methods through Python while applying them to the Knight Lab datasets;
- o Co-authored a research article about the horseshoe effect, explaining how it arises in various datasets after SVD dimensionality reduction, and how to learn from it to **build a better metric for data sets with an underlying gradient**:
See: [*Uncovering the Horseshoe Effect*, Morton - Toran](#) (11 citations).

Inria (National Institute for Research in Computer Science and Automation)

Grenoble, France

Computer Science Research Assistant Intern

2016

3 months at the BiPoP team. My work was centered on the modelization, simulation, control and optimisation of nonsmooth systems, applied on the example of cloth's move simulation with implicit contact and exact Coulomb friction:

- o Solved examples of Coulomb friction problems in Python;
- o Created an enumerative type solving of a new formulation of the Coulomb friction problem and implemented it using C and C++. The resulting solver was **ten times faster** than the previous one. It later led to the following research article:
See: [*An Implicit Frictional Contact Solver for Adaptive Cloth Simulation*](#)

Miscellaneous

Math & Physics Tutoring for Undergraduate students

2018-2019

Skills

Programming: Python (Jupyter, Pandas, sklearn, Keras, PyTorch, TensorFlow, Matplotlib, Seaborn, ...), C, C++.
SQL, Linux, Git, LaTeX, MatLab, Lisp, Excel.

Machine Learning: Regression, Classification, Feature engineering, NLP, Cross validation, Scoring, Metrics.

Statistical Models: Linear, Trees, Forests, Boosting, SVMs, Neural Networks.

Languages: English & French: **Fluent** Japanese : Basic