Charlie Godfrey

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Skills

• Python (`numpy, scipy, pandas`) • Mathematica • MATLAB • Git • Bash • Linux

Education

PhD in Mathematics, The University of Washington-Seattle — June 2021

- Extended results on singularities using **inductive construction algorithms** for semi-simplicial schemes. Built a new **Fourier-type transform** on differential forms with poles using **duality theory**. Defined generalizations of *ordinary* **elliptic curves** over finite fields and studied their deformations
- Completed the eScience Institute's Advanced Graduate Data Science Option
  - PhD-level courses in **machine learning, data visualization and statistical inference**
  - Implemented machine learning methods like **LASSO, kernel regression and k-means clustering** in raw `numpy` and `scipy`
  - Helped create a **visualization prototype** displaying variability in dengue cases in Peru by region and over time, leveraging `geopandas` and `D3.js`.
- Department of Mathematics Graduate Fellowship — 2018-2019

Master's of Science in Mathematics, The University of Washington-Seattle — June 2018
Bachelor's of Science in Mathematics and Physics, The University of Wisconsin-Madison — May 2014

Experience

Student, MSRI Mathematics of Machine Learning Summer Graduate School — July 29-August 9 2019

- Attended mini-courses and problem sessions on **statistical learning, convex optimization, bandits, deep learning and reinforcement learning**
- Presented an expository account of recent work on **linear stochastic bandits**

Program Associate, Mathematical Sciences Research Institute — March-May 2019
Graduate Mentor, Washington Experimental Math Laboratory — January 2019-December 2020

- Mentored undergraduate research projects on foundations of quantum mechanics and mathematical epidemiology
- Led tutorials on **Python and Jupyter notebooks**

Research Experience For Undergraduates — Summer 2013
The University of Minnesota School of Physics and Astronomy

- Designed and performed experiments using the BL21Rosetta2 strain of *E. coli* in the context of synthetic biology. Used **MATLAB** to **solve differential equations modelling genetic circuits**

Preprints

[1] 2021a (with Takumi Murayama). "Du Bois Singularities in Families". In: *In preparation*.
[2] May 2021. "Higher Direct Images of Ideal Sheaves, Correspondences in Log Hodge Cohomology and Globally F-Full Varieties". PhD thesis. University of Washington. 66 pp. URL: https://godfrey-cw.github.io/assets/pdfs/thesis.pdf.