Dustin V. Tran

Contact Information

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Research Interests

Machine learning, algorithms, numerical analysis, convex optimization, nonparametrics, stochastic processes

Education

Harvard University 2014 – 2015 (Expected)

S.M., Computational Science and Engineering

University of California, Berkeley 2010 – 2014

B.A., Double Major in Mathematics with Highest Honors, Statistics

- Relevant Graduate-Level Coursework:
  Machine Learning, Convex Optimization, Linear Models, Network Theory, Numerical Methods, Distributed Computing, Stochastic Processes

Awards and Honors

- 2010 – 2014: Regents' and Chancellor's Scholarship (Top 0.5% of Applicants)
- 2013: Rose Hills Foundation Science & Engineering Grant
- 2010: Cal Alumni Leadership Scholarship

Research Experience

Earnest, San Francisco, CA

Data Science Intern **May 2014 – Present**

University of California, Berkeley, Berkeley, CA

Nonlinear Programming **January 2014 – May 2014**

- Explored different algorithms to automate model selection in machine learning, particularly via solving the convex relaxation of the conditions, with Prof. Ben Recht
- Wrote a research paper entitled, "Convex Techniques for Model Selection"

Statistical Computing **August 2013 – December 2013**

- Designed an adaptive-rejection sampler for any log-concave probability density function, minimizing function calls under a team of three graduate statisticians
- Managed large databases using UNIX shell scripting, SQL, and computer networks
- Implemented formal testing software in R with revision control, following the official CRAN package guidelines with OOP methods

Numerical Linear Algebra **August 2013 – December 2013**

- Examined applications to signal processing with fast Fourier transforms under Prof. John Strain
- Analyzed conditioning and stability of iterative solvers, e.g., conjugate gradient and GMRES, and drew comparisons to direct methods
- Explored modern decomposition methods for parallel computing which apply divide and conquer techniques

Algebraic Geometry **January 2013 – May 2013**

- Studied topics under coherent sheaves, including derived functors, differential graded categories, the Grothendieck-Serre duality, and the Grothendieck-Riemann-Roch theorem under Prof. David Nadler.
- Wrote a research paper regarding Fukaya categorical methods for distinguishing exotic symplectic structures on smooth complex affine varieties

Symplectic Geometry **January 2012 – May 2012**

- Surveyed motivations of symplectic geometry from Hamiltonian mechanics, and continued onto spectral flow and the Maslov index, 3-dimensional contact geometry, and holomorphic curves under Prof. Michael Hutchings.
- Wrote a research paper entitled, "Non-Standard Symplectic Structures via Symplectic Cohomology"

Talks & Presentations

[1] *Contagion and systemic risk in financial networks*, Stat 206A (Spatial Networks), Berkeley, CA, December 11, 2013.

[2] *Holonomy*, Math 240 (Riemannian Geometry), Berkeley, CA, May 7, 2013.

[3] *Products in cohomology and related examples*, Math 215A (Algebraic Topology), Berkeley, CA, November 16, 2011.

Teaching Experience

University of California, Berkeley, Berkeley, CA

Teaching Assistant **January 2013 – May 2013**

- Math 10B (Methods: Calculus, Statistics, and Combinatorics)
  - Assisted in developing the course material with Prof. Craig Evans

Teaching Assistant **June 2011 – August 2011**

- Math 128A (Numerical Analysis)
  - Assisted in grading and teaching supplementary sections

Programming Skills

- Languages: Python (NumPy, pandas), C/C++, R, MATLAB, UNIX shell scripting
- Software: Vim, Git, SVN, MongoDB, PostgreSQL
- Operating Systems: GNU/Linux, BSD, Windows NT