Daniel Alabi | Curriculum Vitae

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Education

Harvard University **Cambridge, MA**
Ph.D. Computer Science *2016–Present*
Advisors: Michael Mitzenmacher, Salil Vadhan

Columbia University **New York, NY**
Graduate Research Scholar, Applied Mathematics *2015–2016*
Advisor: Chris Wiggins

Carleton College **Northfield, MN**
B.A. Mathematics
B.A. Computer Science *2010–2014*
Graduated *Magna Cum Laude*
Advisors: Gail Nelson (Math) and Jeff Ondich (CS)

Honors & Funding Awards

- Facebook Emerging Scholar 2018-2020
- Courtlandt S. Gross Memorial Scholarship 2018
- Harvard CRCS Graduate Student Fellow 2018
- Interact Fellow 2015
- Member, Mortar Board College Senior Honor Society 2013
- hackNY Fellow 2012
- Kellogg International Scholarship 2010-2014
- United States Achievers Program (USAP) Fellow 2009-2010
- Travel Awards: SIGMOD HILDA 2016, FOCS 2017

Research Experience

1. *With Nicole Immorlica, and Adam Kalai* August 2017–Present
   Research into learning theory for fair and efficient machine learning.

2. *With Yaron Singer* January 2017–December 2017
   Formulated regret bound for asynchronous gibbs sampling. Improved sample complexity lower bound for PAC learning the best arm in the multi-arm bandit problem.

3. *With E. Angelino, C. Rudin, M. Seltzer, and N. Larus-Stone.* September 2016–December 2017
   Research into the design and implementation of a custom discrete optimization technique for building rule lists over a categorical feature space. The algorithm provides the optimal solution, with a certificate of optimality. This framework is a novel alternative to CART and other decision tree methods.

4. *With Eugene Wu* July 2015–August 2016
   Theoretical and applied research into constructing and evaluating a sampling-based approximate query processing system that uses perceptual models (encoded as functions) to construct approximate answers intended for visualization. Our algorithms produce approximate query answers that differ from exact answers by a perceptually indiscernible amount, as defined by perceptual functions.

5. *With Chris Wiggins* July 2015–August 2016
   Meta-research into the modeling and evaluation of tools that will enhance the application of the lean startup methodology to research organizations and companies.

6. *With Gail Nelson* January 2014–June 2014
   Mathematics thesis research on algebraic approaches (as opposed to combinatorial techniques) to the maximum matching problem. Conducted research to reduce the number of matrix inversions done in the Rabin-Vazirani Algorithm.

7. *With Jeff Ondich* September 2013–March 2014
   Theoretical and applied research into the simulation of bike availability in city bike networks.

Publications

Refereed

1. Systems Optimizations for Learning Certifiably Optimal Rule Lists.
   Nicholas Larus-Stone, Elaine Angelino, Daniel Alabi, Margo Seltzer, Vassilios Kaxiras, Aditya Saligrama, and Cynthia Rudin.
   SysML 2018.
2. Learning Certifiably Optimal Rule Lists for Categorical Data.
   Elaine Angelino, Nicholas Larus-Stone, Daniel Alabi, Margo Seltzer, and Cynthia Rudin.
   KDD 2017.
   Selected for oral presentation
   Longer Journal Version, in submission to JMLR
3. PFunk-H: Approximate Query Processing using Perceptual Models.
   Daniel Alabi and Eugene Wu.
   HILDA@SIGMOD 2016.
   Selected for full oral presentation

Theses & Technical Reports

1. Exploiting Visual Perception for Sampling-Based Approximation on Aggregate Queries.
   Daniel Alabi.
   Columbia University Technical Report 1613. September 7, 2015.
2. Maximum Matching Problem: A Randomized, Algebraic Approach.
   Daniel Alabi.
   Senior Capstone Mathematics Project. May 15, 2014.

Teaching & Service

Classes

- **Harvard University** **Cambridge, MA**
  Teaching Fellow, CS 124: Algorithms & Data Structures *January 2018–May 2018*

Spring 2018 (Prof. Jelani Nelson & Prof. Salil Vadhan)

- **Carleton College** — **Northfield, MN**
  Teaching Assistant, CS 201: Data Structures — *January 2014–June 2014*
  Winter 2014 (Prof. Jadrian Miles); Spring 2014 (Prof. Amy Dalal)
- **Carleton College** — **Northfield, MN**
  Teaching Assistant, CS 111: Introduction to Computer Science — *Sep. 2013–Nov. 2013*
  Fall 2013 (Prof. Andy Exley)

Leadership & Service

- International Student Peer Leader, Carleton College — 2011-2012
- President, Carleton Computing Society — 2011-2013
- Student Department Advisor for the CS Department at Carleton College — 2013-2014
- Citizen Schools Volunteer Instructor — 2015
- Judge, CarlHacks — 2015
- Mentor, hackNY Summer Fellowship — 2015, 2016
- FOCS External Reviewer — 2017

Industry Experience

1. Database Kernel Engineer, MongoDB Inc. — June 2014–July 2015
2. Software Engineering Intern, MongoDB Inc. — June 2013–August 2013
3. Software Engineering Intern, Trendrr (acquired by Twitter, Inc.) — June 2012–August 2012

Relevant Coursework

Harvard University, Cambridge, MA
Computational Complexity; Computational Learning Theory (audit); Probability Theory; Markets for Networks and Crowds; Fairness, Privacy, and Validity in Data Analysis (audit); Advanced Algorithms; Online Convex Optimization; Algorithms at the End of the Wire; Research Topics in Operating Systems

Columbia University, NYC
Analysis of Algorithms I; Algorithmic Techniques for Massive Datasets; Statistical Machine Learning; Elementary Stochastic Processes; Database Systems Implementation

Aquincum Institute of Technology (Study Abroad), Budapest, Hungary
Combinatorial Optimization; Graph Theory; Algorithms & Data Structures

Carleton College, Northfield, MN
Artificial Intelligence; Natural Language Processing; Advanced Algorithms; Operating Systems; Programming Languages; Data Mining; Computability & Complexity; Computer Organization & Architecture; Database Systems; Software Design; Mobile Application Development; Computer Music & Sound; Algorithms; Statistical Inference; Probability; Elementary Theory of Numbers; Abstract Algebra; Ordinary Differential Equations; Linear Algebra; Mathematical Structures; Multivariable Calculus