

Sorelle A. Friedler
Assistant Professor of Computer Science

Department of Computer Science, Haverford College
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RESEARCH INTERESTS

The design and analysis of algorithms, computational geometry, data mining and machine learning, and the application of such algorithms to interdisciplinary problems and data.

APPOINTMENTS

Haverford College

Assistant Professor of Computer Science July 2014 - present
Visiting Assistant Professor of Computer Science July 2012 - June 2014

Data & Society Research Institute

Affiliate September 2016 - present
Fellow September 2015 - September 2016

Alphabet, Inc. (formerly Google, Inc.)

Software Engineer, Search Infrastructure (Google) and X (formerly Google [x]) August 2010 - June 2012

EDUCATION

University of Maryland, College Park, MD **Ph.D.** August 2005 - August 2010
Computer Science.
Thesis title: *Geometric Algorithms for Objects in Motion*. Advisor: David M. Mount.

University of Maryland, College Park, MD **M.S.** August 2005 - December 2007
Computer Science.

Swarthmore College, Swarthmore, PA **B.A.** August 2000 - May 2004
Computer Science. Minor: Mathematics.

GRANTS AND AWARDS

NSF DMR-1709351 2017 - 2020
CDS&E: D3SC: The Dark Reaction Project: A machine-learning approach to exploring structural diversity in solid state synthesis. Joshua Schrier, Sorelle Friedler, and Alexander Norquist. \$645,288.

NSF IIS-1633387 2016 - 2019
BIGDATA: Collaborative Research: F: Algorithmic Fairness: A Systemic and Foundational Treatment of Nondiscriminatory Data Mining. Suresh Venkatasubramanian, danah boyd, and Sorelle Friedler. \$953,432 (Haverford portion: \$172,742).

Knight News Challenge Prototype Fund 2016
Could your data discriminate? Sorelle Friedler, Wilneida Negron, Surya Mattu, Suresh Venkatasubramanian. \$35,000.

Data & Society Research Institute Fellow 2015 - 2016
Preventing Discrimination in Machine Learning: from theory to law and policy. \$10,000.

NSF DMR-1307801 2013 - 2016
The Dark Reaction Project: a machine learning approach to materials discovery. Joshua Schrier, Alexander Norquist, and Sorelle Friedler. \$299,998.

- Ann G. Wylie Dissertation Fellowship** 2009 - 2010
Provides tuition, stipend, and health insurance for one semester. Awarded to “outstanding students working on the final stages of their dissertations.”
- AT&T Labs Fellowship Program** 2006 - 2009
Provides tuition, stipend, health insurance, and conference funds for 3 years. Awarded to 5 “outstanding under-represented minority and women students” chosen from a national pool.
- Verizon Fellowship** 2006 - 2007
Monetary award for outstanding academic achievement.
- Graduate School Fellow, University of Maryland** 2005 - 2007
Monetary award for “academic merit, intellectual ability, and the student’s potential to make a unique contribution to the diversity of the educational experience on this campus.”

PAPERS

(Most author orderings are alphabetical. Haverford undergraduate co-authors are denoted with a *.)

Peer-reviewed Journal Papers

Paul Raccuglia*, Katherine C. Elbert*, Philip D. F. Adler, Casey Falk*, Malia B. Wenny*, Aurelio Mollo*, Matthias Zeller, Sorelle A. Friedler, Joshua Schrier, and Alexander J. Norquist. Machine-learning-assisted materials discovery using failed experiments. *Nature*, 533: 73 - 76, May 5, 2016.

Sorelle A. Friedler and David M. Mount. A Sensor-Based Framework for Kinetic Data Compression. *Computational Geometry: Theory and Applications*, 48(3): 147 - 168, March 2015

Sorelle A. Friedler and David M. Mount. Approximation algorithm for the kinetic robust k-center problem. *Computational Geometry: Theory and Applications*, 43(6-7):572 - 586, 2010.

Sorelle A. Friedler, Yee Lin Tan, Nir J. Peer, and Ben Shneiderman. Enabling teachers to explore grade patterns to identify individual needs and promote fairer student assessment. *Computers & Education*, 51(4): 1467 - 1485, December 2008.

Peer-reviewed Conference Proceedings

Philip Adler, Casey Falk*, Sorelle A. Friedler, Gabriel Rybeck*, Carlos Scheidegger, Brandon Smith*, and Suresh Venkatasubramanian. Auditing Black-box Models for Indirect Influence. In *Proceedings of the IEEE International Conference on Data Mining (ICDM)*, 2016. (Acceptance rate: 20%, acceptance as regular paper: 8.5%.)

F. Betul Atalay, Sorelle A. Friedler, and Dianna Xu. Convex hull for probabilistic points. In Technical Papers of the 29th Conference on Graphics, Patterns and Images (SIBGRAPI '16), 2016. (Acceptance rate: 43%.)

Michael Feldman*, Sorelle A. Friedler, John Moeller, Carlos Scheidegger, and Suresh Venkatasubramanian. Certifying and Removing Disparate Impact. In *Proceedings of the 21st ACM SIGKDD International Conference on Knowledge Discovery and Data Mining*, pages 259–268, 2015. (Acceptance rate: 19%.)

Sorelle A. Friedler and David M. Mount. Spatio-temporal Range Searching over Compressed Kinetic Sensor Data. In *Proc. of the European Symposium on Algorithms (ESA)*, pages 386 - 397, 2010. (Acceptance rate: 27%.)

Sorelle A. Friedler and David M. Mount. Compressing kinetic data from sensor networks. In *Proc. of the Fifth International Workshop on Algorithmic Aspects of Wireless Sensor Networks (AlgoSensors)*, pages 191 - 202, 2009. (Acceptance rate: 51%.)

Expanded version available as part of: A Sensor-Based Framework for Kinetic Data Compression, *Computational Geometry: Theory and Applications*.

Workshop Papers and Technical Reports

Danielle Ensign, Sorelle A. Friedler, Scott Neville, Carlos Scheidegger and Suresh Venkatasubramanian. Runaway Feedback Loops in Predictive Policing. Presented as a talk at the *Fairness, Accountability, and Transparency in Machine Learning Workshop*, Aug. 14, 2017.

Danielle Ensign, Sorelle Friedler, Scott Neville, Carlos Scheidegger and Suresh Venkatasubramanian. Decision Making with Limited Feedback: Error bounds for Recidivism Prediction and Predictive Policing. Presented as a poster at the *Fairness, Accountability, and Transparency in Machine Learning Workshop*, Aug. 14, 2017.

Richard L. Phillips*, Kyu Hyun Chang*, and Sorelle A. Friedler. Interpretable Active Learning. Presented at the *ICML Workshop on Human Interpretability in Machine Learning*, Aug. 10, 2017.

Sorelle A. Friedler, Carlos Scheidegger, and Suresh Venkatasubramanian. On the (im)possibility of fairness. arXiv:1609.07236, Sept. 23, 2016. <http://arxiv.org/abs/1609.07236>

Ifeoma Ajunwa, Sorelle Friedler, Carlos E. Scheidegger, and Suresh Venkatasubramanian. Hiring by Algorithm: Predicting and Preventing Disparate Impact. Presented at the Yale Law School Information Society Project conference *Unlocking the Black Box: The Promise and Limits of Algorithmic Accountability in the Professions*, Apr. 2, 2016.

Michael Feldman*, Sorelle A. Friedler, John Moeller, Carlos Scheidegger, and Suresh Venkatasubramanian. Certifying and Removing Disparate Impact. Presented at the *Fairness, Accountability, and Transparency in Machine Learning Workshop*, Dec. 12, 2014. <http://arxiv.org/abs/1412.3756>

Expanded version available as part of: Certifying and Removing Disparate Impact, in *Proceedings of the 21st ACM SIGKDD International Conference on Knowledge Discovery and Data Mining*.

F. Betul Atalay, Sorelle A. Friedler, and Dianna Xu. Probabilistic Kinetic Data Structures. Presented at the *Fall Workshop on Computational Geometry*, Oct. 25, 2013. <http://arxiv.org/abs/1412.1039>

Expanded version available as part of: Convex Hull for Probabilistic Points, in *Proceedings of the Brazilian Symposium on Computer Graphics and Image Processing (SIB-GRAPI)*.

Sorelle A. Friedler and David M. Mount. Spatio-temporal Range Searching Over Compressed Kinetic Sensor Data. *Second Workshop on Massive Data Algorithms (MASSIVE 2010)*, June 17, 2010.

Expanded version available as part of: Spatio-temporal Range Searching over Compressed Kinetic Sensor Data, in *Proc. of the European Symposium on Algorithms (ESA)*.

Sorelle A. Friedler and David M. Mount. Realistic Compression of Kinetic Sensor Data. *University of Maryland Computer Science Department*, Technical Report CS-TR-4959, June 6, 2010. <http://hdl.handle.net/1903/10114>

Expanded version available as part of: A Sensor-Based Framework for Kinetic Data Compression, *Computational Geometry: Theory and Applications*.

Popular Press Articles

Nicholas Diakopoulos and Sorelle Friedler. How to Hold Algorithms Accountable. *MIT Technology Review*, Nov. 17, 2016.

<https://www.technologyreview.com/s/602933/how-to-hold-algorithms-accountable/>

Thesis

Sorelle A. Friedler. Geometric Algorithms for Objects in Motion. Dissertation committee: Prof. David Mount (chair), Prof. William Gasarch, Prof. Samir Khuller, Prof. Steven Selden, Prof. Amitabh Varshney. Defense date: July 30, 2010.

Book Reviews

Sorelle A. Friedler. Review of Pioneering Women in American Mathematics: the Pre-1940 PhD's by Judy Green and Jeanne LaDuke. SIGACT News 42(2): 37-41, 2011.

Sorelle A. Friedler. Review of Change is Possible: Stories of Women and Minorities in Mathematics by Patricia Clark Kenschaft. SIGACT News 41(2): 47-50, 2010.

PATENTS

Sorelle Alaina Friedler, Mohammed Waleed Kadous, Andrew Lookingbill. *Position indication controls for device locations*. US 20130131973 A1 (also WO 2013078125 A1). Publication date: May 23, 2013.

Mohammed Waleed Kadous, Isaac Richard Taylor, Cedric Dupont, Brian Patrick Williams, Sorelle Alaina Friedler. *Permissions based on wireless network data*. US 20130244684 A1 (also WO2013138304 A1). Publication date: Sep 19, 2013.

KEYNOTE TALKS

NSF Workshop on Data Science for Secure and Privacy-aware (DSSP) Sept. 26, 2016
Large Data Management and Mining, Snowbird, UT
Algorithmic Fairness: Guaranteeing fairness and non-discrimination in machine-learned decision making

INVITED TALKS

Rutgers University DIMACS REU, New Brunswick, NJ June 13, 2017
Auditing Black-box Models

Brown University, Providence, RI Mar. 9, 2017
Algorithmic Fairness: Guaranteeing fairness and non-discrimination in machine-learned decision making

Rutgers / Bryn Mawr Undergraduate Workshop, Camden, NJ July 25, 2016
Data Structures for Kinetic Multidimensional Point Sets

Consumer Financial Protection Bureau, Washington, DC May 5, 2016
*Biased Data, Biased Algorithms:
Detecting and Preventing Discrimination in Machine-Learned Decisions*

Williams College, Computer Science Dept. Colloquium, Williamstown, MA Apr. 15, 2016
*Biased Data, Biased Algorithms:
Detecting and Preventing Discrimination in Machine-Learned Decisions*

Microsoft Research, NY, NY Jan. 14, 2016
Detecting and Preventing Discrimination in Machine-Learned Decisions

Arcadia University Mathematics Education Colloquium, Glenside, PA Feb. 19, 2009
How do Computers Solve Geometric Problems?

CONTRIBUTED TALKS (Conferences and Workshops)

- Fairness, Accountability, and Transparency in Machine Learning, Halifax, NS, Canada Aug. 14, 2017
Runaway Feedback Loops in Predictive Policing
- International Workshop on Obfuscation: Science, Technology, and Theory New York University, NY, NY Apr. 7, 2017
Obfuscating Data to Prevent Discrimination
- AALAC Workshop on Data Ethics, Pomona College, Claremont, CA Feb. 10, 2017
Algorithmic Fairness
- Fairness for Digital Infrastructure Workshop, UPenn, Philadelphia, PA Jan. 20, 2017
On the (Im)possibility of Fairness
- IEEE International Conference on Data Mining, Barcelona, Spain Dec. 14, 2016
Auditing Black-box Models for Indirect Influence
- SIBGRAPI Conference on Graphics, Patterns and Images, São José dos Campos, Brazil Oct. 5, 2016
Convex Hull for Probabilistic Points
- Dagstuhl Seminar on Data, Responsibly, Wadern, Germany July 19, 2016
Auditing Black-box Models
- Data & Society Workshop, NY, NY May 16, 2016
Hiring by Algorithm: Predicting and Preventing Disparate Impact
- National Council on Measurement in Education, Washington, DC Apr. 9, 2016
Fairness and Machine Learning for Educational Practice (panel)
- Yale Law, Unlocking the Black Box, New Haven, CT Apr. 2, 2016
Hiring by Algorithm: Predicting and Preventing Disparate Impact
- Fairness, Accountability, and Transparency in Machine Learning, Montreal, Canada Dec. 12, 2014
Certifying and Removing Disparate Impact
- Fall Workshop on Computational Geometry, NY, NY Oct. 25, 2013
Probabilistic Kinetic Data Structures
- AALAC/Mellon 23 Working Group on Information, Bryn Mawr College, PA Oct. 27, 2012
Information Content in Motion
- European Symposium on Algorithms (ESA 2010), Liverpool, UK Sept. 7, 2010
Spatio-temporal Range Searching Over Compressed Kinetic Sensor Data
- Second Workshop on Massive Data Algorithms (MASSIVE 2010), Snowbird, Utah June 17, 2010
Spatio-temporal Range Searching Over Compressed Kinetic Sensor Data
- Fifth International Workshop on Algorithmic Aspects of Wireless Sensor Networks, Rhodes, Greece July 11, 2009
Compressing Kinetic Data From Sensor Networks
- AT&T Research Lab Colloquium, Florham Park, NJ Aug. 11, 2006
An Implementation of Jain's Algorithm for Survivable Network Design.

PEDAGOGICAL / GENERAL AUDIENCE TALKS

- Optimizing Government: Policy Challenges in the Machine Learning Age
University of Pennsylvania, Philadelphia, PA
Can Technology Be Democratic?
Transparency and Accountability in Machine Learning (panel) March 21, 2017
- Center for Information Technology Policy, Princeton University, NJ
Principles for Accountable Algorithms March 3, 2017
- IEEE ICDM International Workshop on Privacy and Discrimination
in Data Mining, Barcelona, Spain
Closing panel: Ethical Data Mining - Challenges and Opportunities (panel) Dec. 12, 2016
- Workshop on Fairness, Accountability, and Transparency
in Machine Learning, NY, NY
Opening Panel: Setting the Stage (panel) Nov. 18, 2016
- Dagstuhl Seminar on Data, Responsibly, Wadern, Germany
Teaching Ethical Issues in Data Mining to Undergraduates July 21, 2016
- NYU Law, Bernstein Institute for Human Rights, NY, NY
Data Hygiene and Algorithmic Oversight (panel moderator) Mar. 22, 2016
- SXSW, Austin, TX
Biased Algorithms and the Future of Prejudice (panel) Mar. 13, 2016
- Data & Civil Rights Conference, Washington, DC
Discriminatory Machine Learning Oct. 27, 2015
- Grace Hopper Celebration of Women in Computing, Houston, TX
Diverse Paths to Teaching and Research at Liberal Arts Colleges (panel) Oct. 15, 2015

INVITED WORKSHOPS

- NSF BIGDATA PI Meeting, Washington, DC Mar. 13 - 15, 2017
- Fairness for Digital Infrastructure Workshop,
University of Pennsylvania, Philadelphia, PA Jan. 19 - 20, 2017
- MacArthur Foundation Consultation on Opportunities and Challenges with
Algorithmic Decision-Making Tools in the Criminal Justice Field, Chicago, IL Oct. 28, 2016
- USACM Algorithmic Transparency and Accountability,
University of Pennsylvania, Philadelphia, PA Oct. 27, 2016
- Dagstuhl Seminar on Data, Responsibly, Wadern, Germany July 17 - 22, 2016
- Data & Civil Rights Conference, Washington, DC Oct. 27, 2015
- NSF Workshop on the Rise of Data in Materials Research, College Park, MD June 29 - 30, 2015

SELECTED PRESS

- Related to *Machine-learning-assisted materials discovery using failed experiments*:**
Adam Marcus and Ivan Oransky. What scientists could learn from startups. *The Week* and *STAT*, May 12, 2016.
Daniela Hernandez. Why Machines Should Learn From Failures. *The Wall Street Journal*, May 6, 2016.
Jordana Cepelewicz. Lab Failures Turn to Gold in Search for New Materials. *Scientific American*,

May 6, 2016.

Philip Ball. Computer gleans chemical insight from lab notebook failures. *Nature News*, May 4, 2016.

Related to *Certifying and removing disparate impact*:

Lauren J. Young. Computer Scientists Find Bias in Algorithms. *IEEE Spectrum*, August 21, 2015.

Julianne Pepitone. Can Resume-Reviewing Software Be As Biased As Human Hiring Managers? *NBC News*, August 17, 2015.

Kiona Smith-Strickland. Computer Programs Can Be as Biased as Humans. *Gizmodo*, August 16, 2015.

Background on Algorithmic Fairness:

Megan Rose Dickey. Algorithmic accountability: Algorithms are designed to make our lives easier. The problem is, they're designed by us. *TechCrunch*, Apr 30, 2017.

Stephanie Pappas. Bad News: Artificial Intelligence Is Racist, Too. *Live Science*, Apr 13, 2017.

Nidhi Subbaraman. Scientists Taught A Robot Language. It Immediately Turned Racist. *BuzzFeed News*, Apr 13, 2017.

Jeremy Hsu. AI Learns Gender and Racial Biases from Language. *IEEE Spectrum*, Apr 13, 2017.

Sam Levin. A beauty contest was judged by AI and the robots didn't like dark skin. *The Guardian*, September 8, 2016.

David Ingold and Spencer Soper. Amazon Doesn't Consider the Race of Its Customers. Should It? *Bloomberg*, April 21, 2016.

Rose Eveleth. The Inherent Bias of Facial Recognition. *Motherboard*, March 21, 2016.

Laura Sydell. Can Computer Programs be Racist and Sexist? *NPR*, March 15, 2016.

Lauren Kirchner. When big data becomes bad data. *ProPublica*, September 2, 2015.

Hal Hodson. No one in control: The algorithms that run our lives. *New Scientist*, February 4, 2015.

PROFESSIONAL SERVICE

Guest Editor

Big Data, "Special Issue on Social and Technical Trade-Offs," 2017

Program Committee Co-chair

2018 Conference on Fairness, Accountability, and Transparency (FAT*)

2015 and 2016 Workshops on Fairness, Accountability, and Transparency in Machine Learning

Program Committee Member

2018 SIAM Algorithm Engineering and Experiments (ALENEX)

2017 International Conference on Information and Knowledge Management (CIKM)

2017 ACM SIGKDD International Conference on Knowledge Discovery and Data Mining (KDD), Applied Data Science Track

2017 Workshop on Fairness, Accountability, and Transparency in Machine Learning (FAT/ML)

2017 Workshop on Ethics in Natural Language Processing

2017 Workshop on Technology and Consumer Protection (ConPro)

2017, 2016, 2015 SIAM International Conference on Data Mining (SDM)

Workshop Co-organizer

2017, 2016, 2015 Workshops on Fairness, Accountability, and Transparency in Machine Learning

2017 AALAC Workshop on Data Ethics

Committee Member

2017, 2016 CRA Outstanding Undergraduate Researchers Selection Committee

2015 ACM Student Research Competition poster judge at Grace Hopper

Reviewer

2017 Nature and Nature Communications

2017 CSCW

2017, 2016 NSF Panels
 2014 ACM-SIAM Symposium on Discrete Algorithms
 2011 Symposium on Computational Geometry
 2008 Scandinavian Workshop on Algorithm Theory

Haverford College Teaching and Service

Haverford College is a leading liberal arts college with a student body of 1,290 composed entirely of undergraduate students. The teaching load is 5 courses per year, with lab / discussion sections and senior thesis advising counting towards the total teaching load. The college operates under a philosophy of shared governance among the administration, faculty, students, and staff.

Undergraduate Thesis Advisees by Graduation Year

2018 Richard Phillips
 Derek Roth

2017 Kyu Chang, *Explaining Active Learning Queries*
 Evan Hamilton, *Benchmarking Fairness Aware Machine Learning*
 Tionney Nix, *A Rule Learning Approach to Discovering Contexts of Discrimination*

2016 Casey Falk, *Auditing Deep Neural Networks and Other Black-box Models*
 Jason Feinberg, *k-Robust Nearest Neighbor Search and Classification*
 Brian Guggenheimer, *The Red Pen: Applying Computer Vision to Automate the Grading of Traditional Assignments*
 Geoffrey Martin-Noble, *Optimizing a Machine Learning System for Materials Discovery*
 Gabriel Rybeck, *Indirect Discrimination in the Age of Big Data*
 Brandon Smith, *Auditing Deep Neural Networks to Understand Recidivism Prediction*

2015 Michael Feldman, *Computational Fairness: Preventing Machine-Learned Discrimination*
 Aaron Lowe, *Persistence in Learning: Persistent Homology and its Application to Machine Learning*

2014 Paulina Cueto, *Identifying the Relationship Between Evolutionary Distance and the Accuracy of Cis-Regulatory Module Predictions*
 Harry Levin, *Computerized Redistricting: Examining the Weighted Points Version of the Capacitated k-Center Problem*
 Karl Moll, *Community Detection in Multidimensional Social Networks*
 Paul Raccuglia, *Dark Reactions: Recommender Guided Materials Discovery*
 Yingying (Daisy) Sheng (Bryn Mawr College), *A Practical Evaluation of Kinetic Data Structure on Android Devices*

Undergraduate Research Students

| | |
|--|----------------------------|
| Charles Marx '20 | Summer 2017 |
| Yutong Li '19 | Spring 2017 - present |
| Monique Byars '19 | Summer 2016 - present |
| Richard Phillips '18, Beckman scholar | Spring 2016 - present |
| Skyler Ellenburg '18 | Fall 2015 - present |
| Derek Roth '17 | Fall 2015 - present |
| Tosin Alliyu '18 | Summer 2015 - present |
| Tionney Nix '17 | Summer 2015 - present |
| Daniel Washburn '17 | Summer 2015 |
| Geoffrey Martin-Noble '16, Goldwater scholar | Spring 2015 - Spring 2016 |
| Jason Feinberg '16 | Fall 2014 - Spring 2016 |
| Nora Tien '17 | Summer 2014 - Spring 2017 |
| Joshua Serota '16 | Summer 2014 |
| Brian Guggenheimer '16 | Summer 2014 |
| Arthur Emidio Teixeira Ferreira '16 | Summer 2014 |
| Casey Falk '16 | September 2013 - present |
| Paul Raccuglia '14 | September 2012 - June 2014 |

Courses Developed

CS 104 Topics in Introductory Programming

Topics in Introductory Programming is designed to give a general introduction to programming as related to data analysis across many fields. Students will be introduced to standard introductory programming imperative and object oriented techniques as well as data structures necessary to create efficient and understandable algorithmic solutions to problems. Data for analysis will be drawn from a single discipline that will vary per semester, forming a theme for topical study. Topical investigations will include the ethics of data use in that field, how data is commonly generated and used, and implementation of important discipline-specific algorithms.

CS 207 Data Science and Visualization

An introduction to techniques for the automated and human-assisted analysis of data sets. These “big data” techniques are applied to data sets from multiple disciplines and include cluster, network, and other analytical methods paired with appropriate visualizations.

CS 395 Mobile Development for Social Change

Mobile Development for Social Change will focus on standard software engineering principles, object oriented programming, event-driven and multi-threaded programming, Android-specific mobile development concepts, and designing a positive user experience in the context of a semester-long placement with a local non-profit.

COURSES TAUGHT

Haverford College

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|-------------|--------|---|
| Spring 2017 | CS 104 | Topics in Introductory Programming: Social Inquiry (lecture and lab, 25 students) |
| Fall 2016 | CS 340 | Analysis of Algorithms (lecture and lab, 32 students) |
| Spring 2016 | CS 207 | Data Science and Visualization (lecture and lab, 27 students) |
| Fall 2015 | CS 340 | Analysis of Algorithms (lecture and lab, 26 students) |
| Spring 2015 | CS 395 | Mobile Development for Social Change (lecture and lab, 21 students) |
| Fall 2014 | CS 340 | Analysis of Algorithms (lecture and lab, 25 students) |
| Spring 2014 | CS 207 | Data Science and Visualization (lecture and lab, 18 students) |
| Fall 2013 | CS 105 | Introduction to Computer Science (2 sections and 1 lab, 72 students total) |
| Spring 2013 | CS 340 | Analysis of Algorithms (lecture and lab, 32 students) |
| | CS 395 | Mobile Development for Social Change (lecture and lab, 22 students) |
| Fall 2012 | CS 105 | Introduction to Computer Science (co-taught with Dave Wonnacott, 78 students) |
| | CS 101 | Fluency with Information Technology (25 students) |

University of Maryland, College Park

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| Summer 2009 | CMSC 451 | Design and Analysis of Computer Algorithms (10 students) |
| Summer 2007 | CMSC 330 | Organization of Programming Languages (39 students) |

COLLEGE SERVICE

Appointed Service

| | |
|---|-------------------------|
| Innovation Programs Faculty Coordinator | Fall 2016 - present |
| Computational Studies Working Group, member | Fall 2016 - present |
| Panel for Cases of Sexual and Racial Harassment, Faculty representative | Fall 2016 - Spring 2017 |
| Visual Studies Search Committee, member | Fall 2015 - Spring 2016 |
| Visual Studies Working Group, member | Fall 2014 - Spring 2015 |

Departmental Service

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|--|-------------------|
| Computer Science Departmental Search Committee | Spring 2015, 2017 |
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Advising

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|-----------------------------------|---------------------|
| class of '20: 5 freshmen advisees | Fall 2014 - present |
| class of '19: 5 freshmen advisees | |
| class of '18: 6 majors, 3 minors | |
| class of '17: 3 majors | |
| class of '16: 9 majors, 3 minors | |

Other Service / Activities

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|---|--------------------------|
| Innovation Incubator, informal working group member | Spring 2015 - present |
| Computational Studies, informal working group member | Fall 2015 - present |
| MakerArts space discussions within VCAM | Fall 2015 - present |
| Haverford Women in STEM panel participant | Spring 2016 |
| Physics faculty search participant | Spring 2016 |
| Digital scholarship librarian search participant | Spring 2016 |
| Beckman Scholars Selection Committee | Spring 2015 |
| Critical Making Faculty Seminar, co-organizer | Spring 2015 |
| http://tdh.brynmawr.edu/criticalmaking/ | |
| Tri-Co Hackathon, co-organizer | Spring 2014, Spring 2015 |
| Haverford OutWeek, panel participant | Fall 2013, Fall 2014 |