Deborah S. Katz

EDUCATION	

Carnegie Mellon University, Pittsburgh, Pennsylvania, USA
Computer Science Department

M.S. and Ph.D., Computer Science — **May 2015 and September 2020**

- **Advisor:** Claire Le Goues
- **Dissertation:** Identification of Software Failures in Complex Systems Using Low-Level Execution Data

New York University School of Law, New York, New York, USA

J.D. — **May 2007**

- **Honors:** Executive Editor, *Environmental Law Journal*

Amherst College, Amherst, Massachusetts, USA

B.A., Computer Science — **May 2004**

- **Honors:** Departmental *summa cum laude* for thesis; Associate Member Sigma Xi

EXPERIENCE

Seegrid, Pittsburgh, Pennsylvania, USA

Research Software Engineer — **January 2021 - July 2022**

Founding member of "Blue Labs" research and development team for industrial autonomous mobile robotics company. Developed processes and pipeline for long-term research for new products and features. Interacted with all company domains and departments, including software, hardware, and testing. Established major partnership with Applied Intuition for world-aware, high-fidelity simulation, by soliciting requirements, evaluating simulation solutions and providers, constructing detailed statement of work, and starting software integration. Used machine and deep learning for insights about products in customer environments.

Carnegie Mellon University, Pittsburgh, Pennsylvania, USA

Graduate Research Assistant — **August 2012 - September 2020**

Conducted research under the supervision of Professor Claire Le Goues and in collaboration with Professor Philip Koopman. Investigated use of low-level execution data obtained through dynamic binary execution as a tool for assessing program behavior, with particular application to robotics and autonomous systems. Investigated robustness testing of robotics systems and applications of the above techniques thereto, in collaboration with the National Robotics Engineering Center. Analyzed nondeterministic properties of and effects of timing delays on robotics systems. Researched barriers to systematic automated testing and simulation of autonomous and robotics systems.

Relevant Courses
15-740: Computer Architecture; 15-744: Computer Networks; 15-745: Optimizing Compilers for Modern Architectures; 15-814: Type Systems; 15-887: Planning, Learning, and Execution; 17-808: Software Engineering Research

Teaching Assistant

- 15-745: Optimizing Compilers for Modern Architectures — **Spring 2014**
- 17-654: Analysis of Software Artifacts — **Spring 2015**

Service

- Computer Science Department Masters Admissions Committee — **2012-2017**

GrammaTech, Inc., Ithaca, New York, USA — **Summer 2016**
Software Engineering Intern
Built a system for decompilation of binary data to C code, based on an existing model for natural language translation using recurrent neural networks (RNNs). Researched various issues relating to

decompilation, RNNs, how to extend existing RNN-based models, and hardware for running RNNs.

Oracle America, Inc., Redwood Shores, California, USA   **Summer 2013**
Research Intern
Investigated effects of compiler optimizations on Oracle Database performance. Wrote microbenchmarks in x86-64 assembly to simulate optimization effects. Drafted article and gave talk on same.

Ropes & Gray LLP, New York, New York, USA   **September 2007 - September 2009**
Intellectual Property Litigation Associate Attorney   **September 2010 - February 2012**
Participated in many aspects of patent litigation and related matters. Analyzed patent technical descriptions and claims. Analyzed products and technical documents to determine infringement. Prepared written materials to explain complex technological concepts for non-technical audiences. Worked closely with technical experts. Advised clients. Dealt with varied technologies.

Pillsbury Winthrop Shaw Pittman, LLP, New York, New York, USA   **Summer 2006**
Summer Associate (permanent offer received)
Drafted memoranda regarding complex legal issues. Assisted in negotiations. Drafted book updates.

NYU Environmental Law Journal, New York, New York, USA   **Fall 2005 - Spring 2007**
Staff Editor (2005-2006), Executive Editor (2006-2007)
Primary responsibility for several articles each issue. Led team to confirm factual and legal assertions.

Honors Thesis, Amherst College, Amherst, Massachusetts, USA   **Fall 2003 - Spring 2004**
An Evaluation of the SEGQ Replacement Policy with Adaptive Variations for Running Time Reduction
Designed, coded, and ran experiments to simulate page replacement policies for virtual memory management. Evaluated data. Designed and simulated novel replacement policies based on results.

PAPERS ACCEPTED
FOR PUBLICATION

- Simulation for Robotics Test Automation: Developer Perspectives, Afsoon Afzal, **Deborah S. Katz**, Claire Le Goues, and Christopher Steven Timperley, ICST 2021.
- Robustness Inside Out Testing, **Deborah S. Katz**, Milda Zizyte, Casidhe Hutchison, David Guttendorf, Patrick E. Lanigan, Eric Sample, Philip Koopman, Michael Wagner, and Claire Le Goues, DSN-Industry 2020.
- Detecting Execution Anomalies As an Oracle for Autonomy Software Robustness, **Deborah S. Katz**, Casidhe Hutchison, Milda Zizyte, and Claire Le Goues, ICRA 2020.
- Crashing Simulated Planes is Cheap: Can Simulation Detect Robotics Bugs Early?, Christopher Steven Timperley, Afsoon Afzal, **Deborah S. Katz**, Jam Marcos Hernandez, and Claire Le Goues, ICST 2018.
- Using Recurrent Neural Networks for Decompilation, **Deborah S. Katz**, Jason Ruchti, and Eric Schulte, SANER 2018.
- Understanding Intended Behavior Using Models of Low-level Signals, **Deborah S. Katz**, ISSTA-DOC 2017.

INVITED TALKS

- Moderator for Panel: Software Quality in Robotics (ROS World) November 2020.
- Identification of Software Failures in Robotics Systems Using Low-Level Execution Data and Robustness Inside Out Testing (ROS QA Working Group Meeting) September 2020.
- Ensuring Software Quality in Complex Settings (Amherst College) October 2019.

ADDITIONAL
INFORMATION

Eligible to practice law in New York and Massachusetts. Enjoy theater, literature, knitting, travel, and cooking. A founding producer of the Carnegie Mellon School of Computer Science musical. Visited all seven continents during sabbatical year, 2009-2010.