

Emma Tosch

PhD Candidate

University of Massachusetts Amherst

College of Information and Computer Sciences

Advisors: Drs. Eliot Moss & David Jensen

140 Governors Drive

Amherst, MA 01002

etosch@cs.umass.edu

<http://github.com/etosch>

<http://etosch.github.io>



Education

Ph.D. **Computer Science**. University of Massachusetts, Amherst. Amherst, MA. 2011 – present.

M.S. **Computer Science**. University of Massachusetts Amherst. Amherst, MA. 2011 – 2015.

M.A. **Computer Science**. Brandeis University. Waltham, MA. 2009 – 2011.

B.A. **English Literature**. Wellesley College. Wellesley, MA. 2006 – 2008.

Research Experience

Research Assistant. May 2018 – present. University of Massachusetts, Amherst. KDL Lab, Advisor: David Jensen. Developing tools and methods to assist with evaluation on the DARPA Explainable AI (XAI) program.

Research Assistant. May 2013 – January 2017. University of Massachusetts, Amherst. PLASMA Lab, Advisor : Emery Berger. Developed a domain specific programming language and runtime system to design, debug, and deploy scientific surveys on the web, at scale.

Research Intern. June 2015 – August 2015. Facebook, Inc. Menlo Park, CA. Core Data Science – Economic Research Team, Statistics and Decision Science Team. Mentor: Eytan Bakshy. Static Analysis for the PlanOut DSL.

Research Assistant. September 2011 – January 2013. University of Massachusetts, Amherst. CI Lab, Advisor : Lee Spector. Researched new metrics for evaluating parameters of evolutionary search based on techniques from nonparametric statistics.

Visiting Researcher. June 2010 – August 2010. Institute for Creative Technologies. Playa Vista, CA. Supervisor : Ron Artstein. Augmented and evaluated a natural language generation and question-answering system for virtual humans.

Publications

J. Foley, **E. Tosch**, K. Clary, D. Jensen. ToyBox: Better Atari Environments for Testing Reinforcement Learning Agents. *NeurIPS Systems for ML Workshop*. 2018.

S. Witty, J.K. Lee, **E. Tosch**, A. Atrey, M. Littman, D. Jensen. Measuring and Characterizing Generalization in Deep Reinforcement Learning. *NeurIPS Critiquing and Correcting Trends in Reinforcement Learning Workshop*. 2018.

K. Clary, **E. Tosch**, J. Foley, D. Jensen. Let's Play Again: Variability of Deep Reinforcement Learning Agents in Atari Environments. *NeurIPS Critiquing and Correcting Trends in Reinforcement Learning Workshop*. 2018.

E. Bakshy, **E. Tosch**. Formal Verification and Automated Causal Inference for Internet-Scale Experiments. CODE@MIT 2015.

E. Tosch, E. Berger. SurveyMan: Programming and Debugging Surveys at Scale. *Proceedings of the 2014 ACM International Conference on Object Oriented Programming Systems Languages and Applications*. ACM New York, NY, USA. 2014. **Best Paper Award**.

E. Tosch, E. Berger. Programming and Debugging Surveys. POPL OBT Workshop 2014.

E. Tosch, L. Spector. Achieving COSMOS: A metric for determining when to give up and when to reach for the stars. *Proceedings of the 14th Intl. Conf. on Genetic and Evolutionary Computation Conference Companion*.

ACM New York, NY, USA. 2012.

K. Harrington, **E. Tosch**, L. Spector, J. Pollack. Compositional Autoconstructive Dynamics *Proc. of the 8th Intl. Conf. on Complex Systems*. 2011.

G. Chen, **E. Tosch**, R. Artstein, A. Leuski, D. Traum. Evaluating Conversational Characters Created through Question Generation. FLAIRS Conference. 2011.

Teaching Experience

Instructor. Reasoning Under Uncertainty (Undergraduate), University of Massachusetts, Amherst. Co-taught with Luis Pineda. Spring 2018.

Teaching Assistant. Advanced Logic (Upper Undergraduate/Graduate), University of Massachusetts, Amherst. Prof. Neil Immerman. Fall 2017.

Teaching Assistant, Guest Lecturer . Reasoning Under Uncertainty (Undergraduate), University of Massachusetts, Amherst. Prof. Andrew McGregor. Spring 2017.

Mentor. REUMass '16. Mentoring an undergraduate (Rosario Huamani Carpio, Pomona College '18). Summer 2016.

Mentor. Google Summer of Code. Official mentor for a GSoC student (Prakhar Srivastav) working on a SurveyMan graphical interface. Summer 2015.

Mentor. UMass Amherst. Mentoring an undergraduate (Molly McMahon) for a summer REU and an independent study with Emery Berger. Summer 2013, Spring 2014.

Teaching Assistant. Reasoning Under Uncertainty (Undergraduate), University of Massachusetts, Amherst. Prof. Andrew McGregor. Spring 2013.

Teaching Assistant, Guest Lecturer. Intro. to Theory of Computation (Undergraduate), Brandeis University. Antonella DiLillo. Spring 2011.

Teaching Assistant. Structure and Interpretation of Computer Programs (Undergraduate), Brandeis University. Prof. Harry Mairson. Fall 2010.

Teaching Assistant. Data Structures (Undergraduate), Brandeis University. Antonella DiLillo. Spring 2010.

Volunteer. Cahners Computer Place, Museum of Science, Boston. Oct. 2009 – May 2010, Sep. 2010 – May 2011

Teaching Training

28 September 2015. Active Learning Training with Rachel Rybaczuk.

Fall 2015. CIRTl Course. Diversity in College Classroom: Teaching the STEM Undergraduate.

Work Experience

Project Assistant. May 2017 – Aug. 2017. UMass, Prof. Charles Weems. Amherst, MA.

Software Engineering Intern. Sept. 2014 – Dec. 2014. Google, Inc. Mountain View, CA.

Data Warehouse Analyst. March 2008 – May 2009. Recombinant Data Corp. Newton, MA.

Assistant Loan Processor. June 2005 – October 2006. Hoffman Companies. Brookline, MA.

Intern. June 2004 – August 2004. New Jersey Division of Law and Public Service. Trenton, NJ.

Talks and Presentations

Software Infrastructure for Machine Learning.

Poster presentation. NeurIPS Systems for ML Workshop. 7 December 2018. Montreal, QC.

Oral presentation (full). IBM AI Systems Day. 4 October 2018. Cambridge, MA.

Programming Languages and Experimentation.

Invited talk. Wellesley College. 9 December 2016. Wellesley, MA.

Oral presentation (full). NEPLS Spring 2016. 31 May 2016. Amherst, MA.

Poster presentation. CODE@MIT. 17 October 2015. Cambridge, MA.

Programming and Debugging Surveys.

Invited talk. SPLASH-I. 8 November 2016. Amsterdam, Netherlands.

Invited talk. Union College. 1 October 2015. Schenectady, NY.

Invited talk. Google, Inc. 13 May 2015. Cambridge, MA.

Poster presentation. UMass Center for Data Science launch symposium. 9 April 2015. Amherst, MA.

Oral presentation (full). OOPSLA 2014. 22 October 2014. Portland, OR.

Oral presentation (short). PLDI Student Research Competition. 11 June 2014. Edinburgh, Scotland.

Poster presentation. CRA-W Graduate Cohort Workshop. 11 April 2014. Santa Clara, CA.

Oral presentation. UMass CS Women. 12 March 2014. Amherst, MA.

Lightning talk. Google PhD Summit. 31 January 2014. Cambridge, MA.

Oral presentation (full). POPL OBT Workshop. 25 January 2014. San Diego, CA.

Programming Language Research and Social Science.

Oral presentation. REUMass Summer '16 Lunch Series. 30 June 2016. Amherst, MA.

Achieving COSMOS.

Oral presentation (full). GECCO UP Workshop. 7 July 2012. Philadelphia, PA.

Women in Computing.

Panelist. MassMutual Women in Technology Conference. 24 April 2015. Springfield, MA.

Professional Activities and Service

ECOOP Artifact Evaluation Committee. Member. 2018.

CICS Graduate Representative. January 2016 – January 2017.

Student Volunteer, PLDI 2016. June 2016.

UMass CS Women. Webmaster. June 2016 – January 2017.

UMass CS Women. Treasurer. January 2016 – May 2016.

UMass CS Women. Co-Chair. January 2015 – January 2016.

PLDI External Review Committee. Member. 2016.

ECOOP External Review Committee. Member. 2016.

POPL OBT Workshop Program Committee. Member. 2016.

WPI STEM Faculty Launch. Participant. September 2015.

ACM-W Early Career Mentoring Workshop. Participant. June 2015.

Program Committee Member. ECOOP DSLDI Workshop 2016.

Artifact Evaluation Reviewer. PLDI 2016.

Computer Science Graduate Admissions Committee. Reviewer. December 2014 – February 2015.

NCWIT Aspirations Scholarship Reviewer. November 2014.

Artifact Evaluation Committee. Reviewer. POPL 2015.

Student Volunteer, SPLASH 2014. October 2014.

Graduate Employee Organization, UAW 2322. Steward. September 2011 – May 2014.

NSF REU Graduate Student Mentor. Summer 2013.

Oregon Programming Languages Summer School. Attendee. July – August 2013.

Brandeis University Women in Computing (for Undergraduates). Founder. April 2010 – May 2011.

Honors, Scholarships, and Awards

2015 WPI STEM Faculty Launch participant and travel grant.
2015 NCWIT Symantec Student Seed Funding (for UMass CS Women)
2015 UMass Amherst School of Computer Science Outstanding Synthesis Award
2014 OOPSLA Best Paper Award
2014 PLDI ACM Student Research Competition (1st Place)
2013 Future of Software Engineering Symposium Scholarship at Microsoft Research
2013 Programming Languages Mentoring Workshop Scholarship
2012 ACM-W conference scholarship (attended SIG-EVO)
2010 Grace Hopper Celebration of Women in Computing Scholarship
2005 Humanities Foundation Award in English Literature