Vasumathi (Vasu) Raman

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Research Overview

I am a researcher and engineer specialized in behaviour and motion planning algorithms, and most interested in scalable methods for guaranteeing correctness of behaviour with respect to formal specifications. I am driven by safety-critical systems performing complex tasks in interactive environments. I enjoy fusing technical and creative perspectives from formal methods for software verification, hybrid systems, robotics, control and game theory.

Professional Experience

Nuro, Inc., Mountain View, CA   February 2018-present
Software Engineer
Built key prediction, planning and interactive planning capabilities, including integration of machine-learned models with heuristic and rule-based approaches. Designed metrics and built evaluation pipelines for prediction and planning. Founding member and Community Chair of Women of Nuro organization, responsible for company-wide education and ally-building.

Zoox, Inc., Menlo Park, CA   October 2016-January 2018
Research Engineer
Algorithmic development and software implementation of planning and control capabilities for self-driving vehicles. Technical lead on key elements of decision planning including signal-controlled intersections, unprotected junction handling and lane changes. Cross-functional coordination and alignment with product management and other engineering teams.

United Technologies Research Center, Berkeley, CA   August 2015-August 2016
Senior Scientist
Projects across all business units, with a focus on decentralized intelligence, privacy and security for cyberphysical systems. Led projects on formal verification of jet engine control logic and disaster management for smart buildings.

California Institute of Technology   August 2013-July 2015
Position: Postdoctoral Scholar
Affiliation: The TerraSwarm Research Center
Advisors: Richard Murray and Sanjit Seshia

Education

Cornell University, Ithaca, NY   2007 - 2013
PhD, Computer Science
Advisor: Hadas Kress-Gazit
Graduate Minor: Economics

Wellesley College, Wellesley, MA   2003 - 2007
B.A. magna cum laude
Majors: Computer Science and Mathematics

University of Edinburgh, Scotland, UK   Spring 2006
Visiting student at the School of Informatics

Mahindra United World College of India, Pune, India   2001 - 2003
International Baccalaureate Diploma

Awards and Honors

NSF EAGER Award for Collaborative Research (2016)
Co-PI on a $200,000 grant on *Socially Responsible Smart Cities: algorithms for smarter*

delivery of community services through population sensing and urban technology. Ongoing collaboration with Yasser Shoukry (UCLA) & Min Kyung Lee (CMU) .

Invited to attend the **Second Heidelberg Laureate Forum** (2014)
> The Heidelberg Laureate Forum brings together winners of the Fields Medal, Abel Prize, Turing Award, and Rolf Nevanlinna Prize with young researchers for a mix of formal lectures and informal interactions. Selected as one of 200 from an application pool of approximately 2000. Includes a travel award to attend the Forum.

Outstanding TA Award, Cornell Department of Computer Science (2008-09)
> Certificate of achievement for outstanding contributions as a Teaching Assistant.

Cornell Fellowship, Cornell University Graduate School (2007-08)
> Merit-based fellowship awarded to first-year PhD students.

Phi Beta Kappa (awarded March 2007)

Sigma Xi (awarded May 2007)

Wellesley College Computer Science Department Honors
> Honors Thesis: "Learning Primitive Predicates for Probabilistic Planning"
> Advisors: Ellen Hildreth (Wellesley), Leslie Kaelbling (MIT)

Jerome A. Schiff Honors Thesis Fellowship (2006-2007)
> Competitive award for senior honors thesis.

Journal Articles

Jonathan A. DeCastro, Javier Alonso-Mora, Vasumathi Raman, Daniela Rus and Hadas Kress-Gazit. *Reactive mission and motion planning with deadlock resolution avoiding dynamic obstacles.* Autonomous Robots, August 2017.

Susmit Jha, Vasumathi Raman, Dorsa Sadigh, Sanjit A. Seshia. *Safe Autonomy Under Perception Uncertainty Using Chance-Constrained Temporal Logic.* Journal of Automatic Reasoning (JAR). To appear 2017.

Constantine Lignos, Vasumathi Raman, Cameron Finucane, Mitch Marcus, Hadas Kress-Gazit. *Provably Correct Reactive Control from Natural Language.* Autonomous Robots, 38(1): 89-105, 2015.

Vasumathi Raman, Nir Piterman, Cameron Finucane, Hadas Kress-Gazit. *Timing Semantics for Abstraction and Execution of Synthesized High-Level Robot Control.* IEEE Transactions on Robotics, 31(3): 591-604, 2015.

Vasumathi Raman, Hadas Kress-Gazit, *Explaining Impossible High-Level Robot Behaviors.* IEEE Transactions on Robotics, 29(1): 94-104, 2013.

Vasumathi Raman, Alexandre Donzé, Mehdi Maasoumy, Richard M. Murray, Alberto Sangiovanni-Vincentelli, Sanjit A. Seshia. *Model Predictive Control for Signal Temporal Logic Specifications.* In submission.

Vasumathi Raman, Dorsa Sadigh, Alexandre Donze, Richard M. Murray, Sanjit A. Seshia. *Reactive Synthesis from Signal Temporal Logic Specifications.* In submission.

Shromona Ghosh, Dorsa Sadigh, Pierluigi Nuzzo, Vasumathi Raman, Alexandre Donze, Alberto Sangiovanni-Vincentelli, S. Shankar Sastry, Sanjit A. Seshia. *Diagnosis and Repair for Synthesis from Signal Temporal Logic Specifications.* In submission.

Conference Publications

Debbie Tsai, Yasser Shoukry, Min Kyung Lee, Vasumathi Raman. *Towards a Socially Responsible Smart City: Dynamic Resource Allocation for Smarter Community Service.* In Proc. of the 4th ACM International Conference on Systems for Energy-Efficient Built Environments (BuildSys 2017). Delft, Netherlands. November 2017.

Cristian Ioan Vasile, Vasumathi Raman, Sertac Karaman. *Sampling-Based Synthesis of Maximally-Satisfying Controllers for Temporal Logic Specifications.* In Proc. of the 2017 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2017). Vancouver, Canada. September 2017.

Chris Paxton, Vasumathi Raman, Greg Hager, Marin Kobilarov. *Combining Neural Networks and Tree Search for Task and Motion Planning in Challenging Environments.* In Proc. of the 2017 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2017). Vancouver, Canada. September 2017.

Susmit Jha, Vasumathi Raman, Tuhin Sahai, Alessandro Pinto, Michael Francis. *On Learning Sparse Boolean Formulae For Explaining AI Decisions.* In Proc. of the 9th NASA Formal Methods Symposium (NFM 2017). Moffett Field, CA, USA. May 2017.

Susmit Jha, Vasumathi Raman, Sanjit A. Seshia. *On ∃ ∀ ∃! Solving: A Case Study on Automated Synthesis of Magic Card Tricks.* In Proc. of Formal Methods in Computer-Aided Design (FMCAD 2016). Mountain View, CA, USA. October 2016.

Susmit Jha, Vasumathi Raman. *Towards Automated Synthesis of Stochastic Linear Hybrid Systems Controllers.* In Proc. of the 14th International Conference on Formal Modeling and Analysis of Timed Systems (FORMATS 2016). Québec City, Canada. August 2016.

Rüdiger Ehlers, Vasumathi Raman, *Slugs: Extensible GR(1) Synthesis.* In Proc. of the 28th International Conference on Computer Aided Verification (CAV 2016). Toronto, Ontario, Canada. July 2016.

Yi-Chin Wu, Vasumathi Raman, Stéphane Lafortune, Sanjit A. Seshia, *Obfuscator Synthesis for Privacy and Utility.* In Proc. of the 8th NASA Formal Methods Symposium (NFM 2016). Minneapolis, MN, USA. June 2016.

Susmit Jha, Vasumathi Raman. *Automated Synthesis of Safe Autonomous Vehicle Control Under Perception Uncertainty.* In Proc. of the 8th NASA Formal Methods Symposium (NFM 2016). Minneapolis, MN, USA. June 2016.

Shromona Ghosh, Dorsa Sadigh, Pierluigi Nuzzo, Vasumathi Raman, Alexandre Donzé, Alberto Sangiovanni-Vincentelli, S. Shankar Sastry, Sanjit A. Seshia. *Diagnosis and Repair for Synthesis from Signal Temporal Logic Specifications.* In Proc. of the 2016 International Conference on Hybrid Systems: Computation and Control (HSCC 2016). Vienna, Austria. April 2016.

Samira Farahani, Vasumathi Raman, Richard M. Murray. *Robust Model Predictive Control for Signal Temporal Logic Synthesis.* In Proc. of the 5th IFAC Conference on Analysis and Design of Hybrid Systems (ADHS 15). Atlanta, GA, USA. October 2015.

Vasumathi Raman, Mattias Fält, Tichakorn Wongpiromsarn, Richard M. Murray. *Online Horizon Selection in Receding Horizon Temporal Logic Planning.* In Proc. of the 2015 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2015). Hamburg, Germany. September 2015.

Jonathan DeCastro, Javier Alonso-Mora, Vasumathi Raman, Daniela Rus, Hadas Kress-Gazit. *Collision-Free Reactive Mission and Motion Planning for Multi-Robot Systems.* In Proc. of the 2015 International Symposium of Robotics Research (ISRR 2015). Sestri Levante, Italy. September 2015.

Jonathan DeCastro, Vasumathi Raman, Hadas Kress-Gazit. *Dynamics-Driven Adaptive Abstraction for Reactive High-Level Mission and Motion Planning.* In Proc. of the 2015 IEEE International Conference on Robotics and Automation (ICRA 2015). Seattle, WA, USA. May 2015.

Mattias Fält, Vasumathi Raman, Richard M. Murray. *Variable Elimination for Scalable Receding Horizon Temporal Logic.* In Proc. of the 2015 American Control Conference (ACC 2015). Chicago, IL, USA. July 2015.

Vasumathi Raman, Alexandre Donzé, Dorsa Sadigh, Richard M. Murray, Sanjit A. Seshia. *Reactive Synthesis from Signal Temporal Logic Specifications.* In Proc. of the 2015 International Conference on Hybrid Systems: Computation and Control (HSCC 2015). Seattle, WA, USA. April 2015.

Vasumathi Raman, Alexandre Donzé, Mehdi Maasoumy, Richard M. Murray, Alberto Sangiovanni-Vincentelli, Sanjit A. Seshia. *Model Predictive Control with Signal Temporal Logic Specifications.* In Proc. of the 2014 IEEE Annual Conference on Decision and Control (CDC 2014). Los Angeles, CA, USA. December 2014.

Vasumathi Raman. *Reactive Switching Protocols for Multi-Robot High-Level Tasks.* In Proc. of the 2014 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2014). Chicago, USA. September 2014.

Vasumathi Raman, Hadas Kress-Gazit. *Synthesis for multi-robot controllers with interleaved motion.* In Proc. of the 2014 IEEE International Conference on Robotics and Automation (ICRA 2014). Hong Kong, China. June 2014.

Vasumathi Raman, Hadas Kress-Gazit. *Towards Minimal Explanations of Unsynthesizability for*

High-Level Robot Behaviors. In Proc. of the 2013 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2013). Tokyo, Japan. October 2013.

Vasumathi Raman, Constantine Lignos, Cameron Finucane, Kenton Lee, Mitch Marcus, Hadas Kress-Gazit. *Sorry Dave, I'm Afraid I Can't Do That: Explaining Unachievable Robot Tasks Using Natural Language*. In Proc. of the 2013 Robotics: Science and Systems Conference (RSS 2013). Berlin, Germany. June 2013.

Vasumathi Raman, Nir Piterman, Hadas Kress-Gazit. *Provably Correct Continuous Control for High-Level Robot Behaviors with Actions of Arbitrary Execution Durations*. In Proc. of the 2013 IEEE International Conference on Robotics and Automation (ICRA 2013). Karlsruhe, Germany. May 2013.

Vasumathi Raman, Cameron Finucane, Hadas Kress-Gazit. *Temporal Logic Robot Mission Planning for Slow and Fast Actions*. In Proc. of the 2012 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2012). Vilamoura, Algarve, Portugal. October 2012.

Vasumathi Raman, Bingxin Xu, Hadas Kress-Gazit. *Avoiding Forgetfulness: Structured English Specifications for High-Level Robot Control with Implicit Memory*. In Proc. of the 2012 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2012). Vilamoura, Algarve, Portugal. October 2012.

Vasumathi Raman, Hadas Kress-Gazit. *Automated Feedback for Unachievable High-Level Robot Behaviors*. In Proc. of the 2012 IEEE International Conference on Robotics and Automation (ICRA 2012). St. Paul, Minnesota, USA. May 2012.

Vasumathi Raman, Hadas Kress-Gazit. *Analyzing Unsynthesizable Specifications for High-Level Robot Behavior Using LTLMoP*. In Proc. of the 23rd International Conference on Computer Aided Verification (CAV 2011). Snowbird, Utah, USA. July 2011.

Joseph Halpern, Rafael Pass, Vasumathi Raman. *An Epistemic Characterization of Zero Knowledge*. In Proc. of the 12th Conference on Theoretical Aspects of Rationality and Knowledge (TARK XII). Palo Alto, California, USA. July 2009.

Workshop Publications (peer-reviewed)

Scott Livingston, Vasumathi Raman. *Chains of Integrators as a Benchmark for Scalability of Hybrid Control Synthesis*. 3rd International Workshop on Applied Verification for Continuous and Hybrid Systems (ARCH 2016). Pittsburgh, PA, USA. April 2017.

Rüdiger Ehlers, Vasumathi Raman. *Low-Effort Specification Debugging and Analysis*. 3rd Workshop on Synthesis (SYNT 2014). Vienna, Austria. July 2014.

Vasumathi Raman, Alexandre Donzé, Mehdi Maasoumy. *Model-Predictive Control from Signal Temporal Logic Specifications: A Case Study*. 4th Workshop on Design, Modeling and Evaluation of Cyber Physical Systems (CyPhy'14). Berlin, Germany. April 2014.

Theses

Vasumathi Raman. *Explaining Unsynthesizability of High-Level Robot Behaviors*. (2013). PhD Thesis, Cornell University, Ithaca, NY, August 2013.

Vasumathi Raman. *Learning Primitive Predicates for Probabilistic Planning*. Honors Thesis, Wellesley College. Wellesley, MA, May 2007.

Key Projects

Scalable Task & Motion Planning with Temporal Logic Specifications   2017-Present
Collaborators: Chris Paxton (Zoox), Cristian Vasile (MIT)
Aim: Lightweight methods for baking properties into system behavior have shown promise for scaling correct-by-construction synthesis beyond illustrative examples and to real-world domains. We have been developing methods for enforcing temporal logic specifications on the outputs of state-of-the-art search-based and sampling-based robotic task and motion planning. These methods are effective at imposing constraints and costs that are automatically generated from logical specifications.

The First Challenge on Formal Methods for Robotics   2014-Present
Collaborators: Scott C. Livingston (Caltech)
Aim: Compared to other areas within robotics research, demonstrations of formal methods have been surprisingly small-scale. This challenge, the first edition of which was held at the IEEE International Conference on Robotics and Automation (ICRA) in May 2016, seeks to

motivate advancement of the state of the art toward practical realization. Details and code are available on the challenge website at <http://www.fmrchallenge.org/>.

Provably Correct Control for Robot Teams   2013-Present
Collaborators: Hadas Kress-Gazit (Cornell), Nora Ayanian (USC)
Aim: Synthesis of centralized and decentralized controllers that guarantee safe execution and goal fulfillment for complex tasks involving teams of robots.

Model Predictive Control Synthesis from Timed Logics   2013-Present
Collaborators: Richard M. Murray (Caltech), Sanjit Seshia (UC, Berkeley)
Aim: A framework for posing model-predictive control tasks as synthesis from signal temporal logic specifications. Motivating case studies include smart building-level ("micro-grid") power systems with controllable loads and generators, and desired timed properties such as the maximum period of power loss during failures or outages.

Timing Semantics for High-Level Robot Control   2011-2013
Advisor: Hadas Kress-Gazit (Cornell University)
Aim: Automatically constructing robot hybrid controllers that guarantee safe execution and goal fulfillment for tasks involving low-level controllers of varying execution times.

Explaining Unsynthesizable Specifications For High-Level Robot Behaviors 2010-2013
Advisor: Hadas Kress-Gazit (Cornell University)
Aim: Finding suitable explanations of unsynthesizable LTL specifications for robot control by exploiting the structure of the control tasks and combining existing and novel techniques from formal methods.

Computational Models of Games With Time Pressure   2009-2010
Advisors: Joseph Halpern, Rafael Pass, Bart Selman (Cornell University)
Aim: Formalizing a computational model to capture game-theoretic properties of time pressure in games such as speed chess and deadline-based negotiations.

Epistemic Characterization of Cryptographic Concepts In Modal Logic   2008-2009
Advisors: Joseph Halpern, Rafael Pass (Cornell University)
Aim: Providing an extended modal logic syntax and semantics for describing a range of cryptographic properties.

Learning Primitive Predicates for Probabilistic Planning   2006-2007
Advisors: Leslie Kaelbling (MIT), Ellen Hildreth (Wellesley College)
Aim: Creating a bootstrapping framework for probabilistic planing using supervised learning of task-specific primitive predicates.

Software

BluSTL   github.com/BluSTL/BluSTL
MATLAB toolkit for automatically generating hybrid controllers from specifications written in Signal Temporal Logic.

Linear Temporal Logic MissiOn Planner (LTLMoP)   ltlmop.github.io/
Modular Python toolkit for designing, testing, and implementing hybrid controllers generated automatically from task specifications written in Structured English, Temporal Logic or a subset of Natural Language.

Small But Complete GROne Synthesizer   github.com/VerifiableRobotics/slugs
C^{++} stand-alone reactive synthesis tool for generalized reactivity(1) synthesis.

The Temporal Logic Planning Toolbox (TuLiP)   tulip-control.sourceforge.net/
Python code for automatic synthesis of correct-by-construction embedded control software.

Teaching and Advising Experience	**Lecturer at the NSF ExCAPE Summer School on Software Synthesis** June 2015

Lecturer at the NSF ExCAPE Summer School on Software Synthesis June 2015
MIT, Cambridge, MA
Planned and instructed a two-part tutorial on *synthesis for robotics*, including a hands-on exercise with using state-of-the-art synthesis tools like LTLMoP and BluSTL.

Instructor for ME/CS 132: Advanced Robotics Spring 2015
California Institute of Technology, Pasadena, CA
Planned and instructed an advanced undergraduate course on robot motion planning. This was a project-based course including a laboratory component.

Summer interns at Zoox (C. Paxton '17) and Nuro (D. Friedovich-Keil '18, O. Zeng '19)
Undergraduate and Graduate Project Advising 2013-Present
Nuro (N), Zoox (Z), Caltech (C), UC Berkeley (B)
Guided students in design and implementation of the following independent research and engineering projects:

- Orien Zeng (N), David Friedovich-Keil (N) *(project details confidential)*
- Chris Paxton (Z) *(combining neural networks and tree search for task and motion planning)*
- Abishek Akella, Aldrich Ong, John Song (B) *(MPC-on-chip with temporal specifications)*
- Dexter Scobee, Omid Bagherieh (B) *(MPC primitives for compositional synthesis from temporal logic specifications)*
- Yuening Zhang (C) *(contract-based design of autonomous robotic taxi systems)*
  Yuening is now a PhD student in EECS at MIT.
- Mattias Fält (C) *(efficient receding horizon control from temporal logic specifications)*
  Mattias is now a PhD student in Automatic Control at Lund University. This project has resulted in two conference publications to date.
- Joon Sik (David) Kim (C) *(environment assumptions for temporal logic control)*
- Jean-Maurice Leonetti (C) *(constructing discrete abstractions for robot motion planning)*
- Benjamin Wu (C) *(formal verification of building access control systems)*

CURIE Academy Teaching Assistant July 2012
Cornell University, Ithaca, NY
Supervised lab-work and provided teaching support for a week long robotics summer school for high school girls.

Undergraduate Independent Study Advisor (Advisee: Brian Finn) Fall 2011
Cornell University Autonomous Systems Lab, Ithaca, NY
Planned and supervised a for-credit undergraduate research project on interfacing SAT solvers with the JTLV temporal logic synthesis tool in order to identify unsatisfiable cores of robot mission specifications.

Teaching Assistant for Decision Theory Fall 2010
Cornell University Department of Computer Science, Ithaca, NY
Graded coursework, held office hours, and provided course feedback to the instructor.
Course Instructor: Joe Halpern.

Head TA, Object-Oriented Programming and Data Structures Spring 2009
Cornell University Department of Computer Science, Ithaca, NY
Delegated and monitored grading, consulting and teaching responsibilities to a staff of 30 TAs. Graded coursework, taught a weekly section, and guest-lectured on special topics. Received outstanding TA award. Course Instructor: Graeme Bailey.

Computer Science Advanced Standing Placement Examiner Fall 2009, 2010, 2012
Cornell University Department of Computer Science, Ithaca, NY

Department-administered exam to determine incoming freshman credits for CS1110 (Introduction to Computing). Graded placement exams, assessed student knowledge, and decided which students would be awarded credit.

Computer Science and Mathematics Tutor 2004-2007
Wellesley College, Wellesley, MA
Held regular group and individual tutoring sessions for a range of CS and math courses.

Professional Service

Conference Activities
Organizer, RSS Workshop on Specifying Planning Problems in Robotics, 2017
Organizer, RSS Workshop on Abstraction and Synthesis of Robotics Software, 2015
Organizer, ICRA Workshop on Formal Methods for Robotics, 2015
Organizer, TerraSwarm Security and Privacy Workshop, 2014
Program Committee, Robotics: Science and Systems Conference, 2015
Program Committee, IFAC Conference on Analysis and Design of Hybrid Systems, 2015
Senior PC, International Joint Conference on Artificial Intelligence, 2016
Session Chair, ICRA 2014
Industry Representative,
   VeHICal Industry Workshops, 2017-present
   Dagstuhl Seminar on Computer-Assisted Engineering for Robotics, 2017
   TerraSwarm Research Center PI Meetings, 2015-16

Reviewing
IEEE International Conference on Robotics and Automation (ICRA 2012-18)
IEEE International Conference on Automation Science and Engineering (CASE 2017)
Automatica (2017)
International Symposium on Robotics Research (ISRR 2015, 2017)
International Conference on Hybrid Systems: Computation and Control (HSCC 2016-17)
International Journal of Robotics Research (IJRR 2014-2017)
IEEE Transactions on Robotics (T-RO 2013-17)
IEEE Conference on Decision and Control (CDC 2013-17)
IEEE Transactions on Automatic Control (TAC 2016)
Discrete Event Dynamic Systems (DEDS 2016)
International Conference on Cyber-Physical Systems (ICCPS 2016)
Robotics: Science and Systems Conference (RSS 2015-16)
IEEE Transactions on Automation Science and Engineering (T-ASE 2015-16)
Logical Methods in Computer Science (LMCS 2015)
Theoretical Computer Science (TCS 2015)
IEEE Journal of Oceanic Engineering (JOE 2015)
American Control Conference (ACC 2013-15)
North-East Student Colloquium on Artificial Intelligence (NESCAI 2008, 2010)

Judge, Cornell Mathematical Contest in Modeling (2011, 2012)

Other Service

Mentoring
Hackbright Academy Mentor (September 2017-June 2018)
Caltech Women Mentoring Women Program (September 2013-July 2015)
Cornell SWE Mentoring Program (August 2011-May 2013)
Cornell CSGO-ACSU Mentoring Program (August 2010-May 2011)

Teaching Volunteer at MacCormick Secure Center June-August 2011
MacCormick is a maximum-security correctional facility for young men aged 16-21 who have committed violent crimes. Taught a communication skills summer course; topics covered included thought organization and job interview preparation. Ran weekly sessions with small class sizes and one-on-one instruction, working primarily with inmates close to being released.

Computer Science Graduate Organization (CSGO)   2009 - 2011
> Founding Member and Social Chair, coordinating department-wide social events.

Expanding Your Horizons   2007 - 2013
> EYH is a one-day conference for 7th-9th grade girls that comprises hands-on workshops and demonstrations by Cornell students and faculty. The conference aims to stimulate the girls' interest in math and science, provide them with female scientist role models, and introduce them to career opportunities in math and science.
> **Fundraising Chair (2012-13):** Raised over $25,000 each year to fund EYH at Cornell.
> **Lansing Correctional Center Outreach Chair (2011-12):** Organized and supervised an EYH mini-conference at the Lansing Correctional Center for Girls in Lansing, NY. Responsibilities included soliciting student-run workshops, negotiating logistics with correctional center staff, and keeping workshop leaders aware of and compliant with the center's policies.
> **Diversity Chair (2009-10):** Increased participation from rural and inner city schools by 20 or more students each year.
> **Workshop Coordinator (2008-2012):** Organized several workshops introducing the girls to various topics in CS, including introductory graph theory and programming using Scratch.

References

Hadas Kress-Gazit – *Ph.D. Advisor*
Associate Professor, Sibley School of Mechanical and Aerospace Engineering
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Richard Murray – *Postdoctoral Advisor*
Professor, Department of Control and Dynamical Systems
California Institute of Technology, CA 91125 USA
Email: murray@cds.caltech.edu
Tel: (626) 395-6460

Sanjit A. Seshia – *Postdoctoral Advisor*
Professor, Department of Electrical Engineering and Computer Sciences
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Tel: (510) 643-6968

Joseph Halpern – *Ph.D. Committee Member*
Professor, Department of Computer Science
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Tel: (607) 255-9562

Alberto L. Sangiovanni-Vincentelli – *Collaborator*
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