Zachary Dodds

Associate Professor of Computer Science
Harvey Mudd College
301 Platt Boulevard
Claremont, CA 91711
909-607-1813
dodds@cs.hmc.edu

Research Interests

Robotics and vision in undergraduate education, including platform development, vision-based robot control, probabilistic map-building, 3d from video, and hand/eye coordination.

Education

Ph.D., Computer Science Department, Yale University, New Haven, CT (2000)
Thesis: *Task Specification Languages for Uncalibrated Visual Servoing*, Advisor: Dr. Gregory D. Hager
M.S., Computer Science, Yale University, New Haven, CT (1996)
Thesis: *A Color Interest Operator for Landmark Selection*
B.A., Mathematics, Yale University, New Haven, CT (1991)
Thesis: Mathematics for Secondary Education

Employment

Associate Professor of Computer Science, Harvey Mudd College (2005-)
Assistant Professor of Computer Science, Harvey Mudd College (1999-2005)
Research Fellow, Yale Center for Computational Vision and Control (1994-1999)
Teaching Assistant, Yale University Department of Computer Science (1995-1999)
Software Developer, HelpMate Robotics, Danbury, CT (1996-1997)
Secondary mathematics and CS teacher, Evansville Day School, Evansville, IN (1992-1994)

Students' honors

Neuron Robotics's award for *Most elegant robotic solution* and cash prize to Zeke Koziol (HMC '10), Sabreen Lakhani (HMC '11), and Anatole Paine (HMC '11) at the 2009 Robotics Innovations Competition and Conference, November 7-8, 2009 at Worcester Polytechnic Institute for their machine-learning approach enabling a webcamera to emulate a laser range scanner.

First place, 2009 Richard Tapia Robotics Competition: Rebecca Green, Sabreen Lakhani, Kate Burgers (all HMC '11) for *import antigravity*, a landmark-finding iRobot Create, Portland, OR. (2009)

Judges' Blue Ribbon for Education, to P. Mawhorter (HMC '08), Z. Koziol (HMC '10), E. Shaver (HMC '09), for their work presented at the 2008 AAAI robot workshop and exhibition. This was a demonstration of several accessible robot platforms, bridging the motivational goals of robot-based education and the research successes of recent mapping and spatial-reasoning algorithms.

First place, 2007 Richard Tapia Robotics Competition: Jessica Wen, Rachel ArceJaeger, and Vedika Khemani, (all HMC '10) for HMC Hammer, a landmark-finding iRobot Create, Orlando, FL. (2007)

2007 AAAI robot exhibition, recognition for *the design and deployment of accessible, low-cost platforms for undergraduate robotics*: Morgan Conbere (HMC '08) AAAI, Vancouver, BC. (2007)

2006 AAAI robot exhibition, judges' award for *the introduction of a novel, low-cost platform for research and education*: Ben Tribelhorn (HMC ’07) AAAI, Boston, MA. (2006)

First place, 2005 AAAI Robotics competition, Scavenger Hunt: Susanna Ricco, Alan Davidson, Mac Mason (all HMC ’06) and Ben Tribelhorn (HMC ’07) AAAI, Pittsburgh, PA (2005). This award included the prize of a Sony AIBO canine robot.

Technical Achievement Award for *Overall Excellence in a Fully Autonomous System* across all AAAI robotics competition categories, by the four students listed above, at AAAI 2005.

Third place, 2005 ACM Student research competition, undergraduate division: Kamil Wnuk (HMC ’06) Mapping with Monocular Vision, ACM Awards banquet (2005)

First place, 2005 SIGCSE undergraduate student research competition: Kamil Wnuk (HMC ’06) Mapping with Monocular Vision, St. Louis, MO (2005)

Last place, 2004 Botball Collegiate Competition, collocated with AAAI 2004 in San Jose, CA. Although our team did not fare well in this competition, several of the group noted that the experience was one of the highlights of their HMC experience.

Honors

Howard and Iris Critchell Assistant Professorship (2004)
Howard and Iris Critchell Assistant Professorship (2003)
Yale University Teaching Fellowship Prize (1998)
Yale University Teaching Fellowship Nomination (1996, 1998)
B.A., Summa cum Laude, Yale University (1991)
Kaplan Mathematics Prize, Yale University (1991)
Phi Beta Kappa (1990)

Workshops, symposia, and exhibitions organized

[co-chair] EAAI: *Educational Advances in Artificial Intelligence* a symposium collocated with AAAI presenting contributions of, by, and for the community of AI educators. [***accepted***, winter 2009-10, with M. Sahami, et al., for inclusion in AAAI '10, Atlanta, GA, July 11-15. 2010]

[co-chair] AAAI Robot exhibition: Student robotics challenge chair, as part of AAAI ’10, Atlanta, GA. July 11-15, 2010. [***accepted***, winter 2009-10]

[co-chair] IJCAI Robot exhibition: Student robotics challenge, chaired with Deborah Burhans, as part of IJCAI ’09, Pasadena, CA. July 11-17, 2009.

[co-chair] AAAI AI Education Colloquium, chaired with Haym Hirsch and Kiri Wagstaff, as part of AAAI ’08 and the AAAI Teaching Forum, Chicago, IL. July 14, 2008.

[chair] AAAI Spring Symposium on Using AI to Motivate Greater Participation in Computer Science, organized with Mehran Sahami, Marie desJardins, Jeffrey Forbes, Tim Huang, Caitlin Kelleher, Tom Lauwers, Todd Neller, and Illah Nourbakhsh. Stanford, CA. March 26-28, 2008.

[chair] SIGCSE workshop, Computer Vision and Image Processing: Accessible resources for undergraduate CS curricula, organized with Bob Avanzato, Doug Blank, Bruce Maxwell, Lisa Meeden, and David Touretzky , as part of SIGCSE '08 Portland, OR. March 12, 2008.

[chair] AAAI Robot exhibition, part of the AAAI '07 robotics competition and exhibition, Vancouver, BC. July 22-26, 2007.

[chair] AAAI Spring Symposium on Robots and Robot Venues: Resources for AI Education, organized with Doug Blank, Paul Rybski, Jerry Weinberg, and Holly Yanco Stanford, CA. March 26-28, 2007.

[chair] SIGCSE workshop, A hands-on exploration of educational robotics, organized with Doug Blank, as part of SIGCSE '07 Covington, KY. March 9, 2007.

[chair] AAAI Robot scavenger hunt, part of the AAAI '06 robotics competition and exhibition, Boston, MA. July 16-20, 2006.

[chair] SIGCSE workshop on Emerging Robotic Resources in Undergraduate CS, organized with Doug Blank and Paul Rybski, as part of SIGCSE '06 Houston, TX. March 3, 2006.

[co-orgainzer] AAAI Spring Symposium on Accessible, Hands-on AI and Robotics Education, organized with L. Greenwald (chair), A. Howard, S. Tejada, and J. Weinberg. Stanford, CA: March 22-24, 2004.

[co-orgainzer] Tutorial in Recent Methods for Image-Based Modeling and Rendering, IEEE Virtual Reality Conference, organized with M. Jagersand (chair), D. Burschka, D. Cobzas, G. Hager, and K. Yerex. Los Angeles, CA: March 22, 2003.

[co-orgainzer] Workshop on Vision-based Motion Control in Human Environments, at the IEEE International Symposium on Computational Intelligence in Robotics and Automation, organized with M. Jagersand and G. Hager (chair). Banff, Alberta: August 1, 2001.

Publications

Journal Issues Edited

Robots and Robotics in Undergraduate AI Education, a special issue of *AI Magazine*, by Dodds, Z., Greenwald, L., Howard, A., Tejada, S., and Weinberg, J., editors. Volume 27, Number 1, Spring 2006, AAAI Press

Book Chapters

Integrating an undergraduate elective with research experiences, by Z. Dodds. In Karukstis and Elgren, Eds. Designing, Implementing, and Sustaining a Research-Supportive Undergraduate Curriculum. CUR Publications, Washington, DC. 2007.

Incremental Focus of Attention: A Layered Approach to Robust Vision and Control, by K. Toyama, G. D. Hager, and Z. Dodds in Robust Vision for Vision-based Control of Motion, IEEE Press, 2000.

Journal Articles

Mawhorter, P. (HMC '08), Koziol, Z. (HMC '10), Shaver, E. (HMC '09), and Dodds, Z. *A Tale of Two Platforms: Low-cost Robotics in the CS Curriculum*. The Journal of Computing Sciences in Colleges 24(4), 2009, pp. 180-188.

Dodds, Z., Greenwald, L., Howard, A., Tejada, S., and Weinberg, J. *Components, Computation, and Community: Robots and Robotics in Undergraduate AI Education*. AI Magazine 27(1), Spring 2006. pp. 11-22.

Hespanha, J., Dodds, Z., Hager, G. D., Morse, A. S. *What Tasks can be Performed with an Uncalibrated Stereo Vision System?* International Journal of Computer Vision, 35(1): 65-85, Nov. 1999.

Dodds, Z., Wang, J., and Miranker, W. *Principal Component Analysis for Place Recognition*, The Journal of Neural, Parallel, and Scientific Computations, Volume 5: 347-358, 1997.

Refereed Conference Papers (HMC student co-authors are cited by graduation year)

Alvarado, C. and Dodds, Z. *Women in CS: An evaluation of three promising practices*. ***Accepted*** to SIGCSE 2010, Milwaukee, WI, March 10-13, 2010.

Grasel, J. (HMC '12), Vonnegut, W. (HMC '11), and Dodds. Z. *Bitwise Biology: Crossdisciplinary physical computing atop the Arduino*. ***Accepted*** to the AAAI Spring Symposium on Using Electronic Tangibles to Promote Learning, Tom Lauwers, chair, Palo Alto, CA, March 22-24, 2010.

Garcia, D., Dodds, Z., Huang, T., Rebelsky, S. *Teaching tips we wish they'd told us before we started*. ***Submitted*** to SIGCSE 2010, Milwaukee, WI, March 10-13, 2010. (***Not*** accepted, but I still liked it!)

Koziol, Z. (HMC '10), Lakhani, S. (HMC '11), Paine, A. (HMC '11) and Dodds, Z. *A vision for spatial-reasoning commodity robots*. Proceedings, IEEE Int. Conf. on Technologies for Practical Robot Applications (TePRA '09), Woburn, MA, Nov. 9-10, 2009.

Koziol, Z. (HMC '10), Paine, A. (HMC '11), Lakhani, S. (HMC '11), and Dodds, Z. *Createing Range from Texture*. Proceedings, 2009 Robotics workshop of the International Joint Conferences on Artificial Intelligence (IJCAI '09), Pasadena, CA, July 11-17, 2009.

Garcia, D. Cutler, R, Dodds, Z., Roberts, E., and Young, A. *Rediscovering the Passion, Beauty, Joy and Awe : Making Computing Fun Again*. (special session) SIGCSE 2009, Chattanooga, TN, March 4-7, 2009, pp. 217-218. ACM Press.

Smith, D. (HMC '09) and Dodds, Z. *Visual Navigation: Image Profiles for Odometry and Control* Proceedings, Consortium for Computing in Small Colleges (CCSC-SW '09) SanDiego, CA, April 3-4, 2009, pp. 168-179.

Hoersting, H. (HMC '10), Bilitchenko, L. (CA Poly, Pomona '11), and Dodds, Z. *Visual Loop-Closing with Image Profiles*. Proceedings, the 24th annual ACM Symposium on Applied Computing (SAC 2009, March 9-12, 2009), pp. 1166-1170, ACM Press.

Dodds, Z. *Leveraging laptops for low-cost, full-fledged outdoor robotics*. Proceedings, Consortium for Computing in Small Colleges (CCSC-RM '08 Colorado Springs, CO, October 17-18, 2008) 24(1) pp. 158-166.

Mawhorter, P. (HMC '08), Koziol, Z. (HMC '10), Shaver, E. (HMC '09), and Dodds, Z. *Mapping for All*. Proceedings of the 2008 AAAI Robotics Exhibition and Workshop, Chicago, IL, July 13-17, 2008, AAAI Press.

Dodds, Z., Alvarado, C., and Sood, S. *Making Research Tools Accessible for All AI Students*. (under review) Proceedings, 2008 AI Education Colloquium (at AAAI '08), Chicago, IL, July 13-17, 2008, AAAI Press.

Dodds, Z. *Leveraging laptops: Resources for low-cost low-level AI*. (to appear) Procedings, 21st Conference of the Florida Artificial Intelligence Research Society (FLAIRS '08), Coconut Grove, FL, May 15-17, 2008, AAAI Press.

Dodds, Z. *AI Assignments in a CS 1 Course: Reflections and Evaluation*. Proceedings, 2008 Conference of the Consortium for Computing Sciences in Colleges (CCSC-SW '08). Northridge, CA, April 18-19, 2008. ACM Press.

Dodds, Z. *Leveraging AI's breadth in CS 1*. AAAI Spring Symposium on Using AI to Motivate Greater Participation in Computer Science. March 26-28, 2008, Stanford, CA. AAAI Press.

Dodds, Z, Alvarado, C., Libeskind-Hadas, R., and Kuenning, G. *Evaluating a Breadth-First CS 1 for Scientists*. Proceedings, 2008 Conference of the Special Interest Group in Computer Science Education (SIGCSE '08) (SIGCSE paper acceptance rate: 31%). March 12-15, 2008, Portland, OR. ACM Press.

Markham, L. (HMC '09), Melton, S. C. (U Chicago, '10), and Dodds, Z. *Robot control via region-based 3d reconstruction*. Proceedings, Intelligent Systems and Control (ISC '07) November 19-21, 2007, Cambridge, MA. ref. 592-151. ACTA Press.

Conbere, M. (HMC '08) and Dodds, Z. *Toys and Tools: Accessible Robotics via Laptop Computers*. Proceedings, 2007 AAAI Robot Workshop, July 23, 2007, Vancouver, BC. AAAI Press

Dodds, Z, Alvarado, C., Libeskind-Hadas, R., and Kuenning, G. *Breadth-First CS 1 for Scientists: Curriculum and Assessment*. Proceedings, 2007 Conference on Innovation and Technology in Computer Science Education (ITiCSE '07), June 25-27, 2007, Dundee, Scotland, ACM Press.

Tribelhorn, B. (HMC '07) and Dodds, Z. *Evaluating the Roomba: A low-cost, ubiquitous platform for robotics research and education*. Proceedings, 2007 International Conference on Robotics and Automation, pp. 1393-1399, Rome, Italy, April 2007, IEEE Press.

Tribelhorn, B. (HMC '07) and Dodds, Z. *Envisioning the Roomba as AI Resource: A Classroom and Laboratory Evaluation*. Proceedings of the 2007 Spring Symposium: Robots and Robot Venues: Resources for AI Education. Stanford, CA, March 2007, AAAI Press.

Tribelhorn, B., (HMC '07) and Dodds, Z. *Roomba and Mac OS X: Cross-platform Vision and Robotics for AI*. Technical Report from the 2006 AAAI Robot Workshop. January, 2007, AAAI Press.

Dodds, Z. and Karp, L. (HMC '04). *The evolution of a computational outreach program to secondary school students*. Proceedings, 2006 ACM SIGCSE Symposium, pp. 448-452. Houston, TX Mar. 1-5, 2006.

Dodds, Z. *Designing an AI elective to Encourage Undergraduate Research*. Proceedings of the 19th International FLAIRS Conference (FLAIRS 2006), Melbourne Beach, FL, May 11-13, 2006.

Dodds, Z and Tribelhorn, B., (HMC '07). *Cost-effective Peripheral Robotics for AI Education*. Proceedings, AAAI 2006, Boston, MA, July 2006, AAAI Press.

Davidson, A. (HMC ’06), Mason, M. (HMC ’06), Ricco, S. (HMC ’06), Tribelhorn, B. (HMC ’07), and Dodds, Z. *Scavenging with a Laptop Robot* Proceedings of the 2005 AAAI Robot Workshop, WS-05-11, Pittsburgh, PA July 13, 2005. AAAI Press, pp 11-15.

Davidson, A. (HMC ’06), Tribelhorn, B. (HMC ’07), Leung, T. (HMC ’05) and Dodds, Z. *Low-cost sensing for laptop robots* Proceedings of the 2005 Robotics and Automation conference (RA ’05) Cambridge, MA Oct. 31-Nov. 2, 2005, pp. 329-333.

Wnuk, K. (HMC '06), Dang, F. (HMC '07), and Dodds, Z. *Dense 3d mapping with monocular vision*. In the Proceedings of the 2nd International Conference on Autonomous Robots and Agents, December 13-15, 2004, University of Massey, Palmerston North, New Zealand.

Dodds, Z., Santana, S. (HMC '06), Erickson, B. (HMC '04), Wnuk, K. (HMC '06), Fischer, J. (HMC '05), and Livianu, M. (HMC '05). *Teaching Robot Localization with the Evolution ER1*, AAAI Spring Symposium on Accessible, Hands-on AI and Robotics Education (SSS '04), Stanford, CA: pp. 18-23, March 2004.

Dodds, Z. and Hager, G. D. *Handling Discontinuities in Stereovisual Alignment Tasks*, International Conference on Intelligent Robots and Systems (IROS '03), Las Vegas, NV: pp. 479-484, October, 2003.

Takacs, G. (HMC '05) and Dodds, Z. *Resources for Sensor-Limited Autonomous Robotic Mapping*, International Conference on Computer, Communication, and Control Technologies (CCCT '03), Orlando, FL: July, 2003.

Dodds, Z. and Hager, G. D. *Complete Languages for Visually Specified Tasks: From Theory to Practice*, by 2000 World Automation Conference (WAC '00), Maui, HI: June 2000.

Dodds, Z. and Hager, G. D. *On Specifying and Performing Visual Tasks with Qualitative Object Models*, 2000 International Conference on Robotics and Automation (ICRA '00), pp. 636-643, June 2000.

Dodds, Z., Hespanha, J., Hager, G. D., and Morse, A. S. *Task Specification and Monitoring for Uncalibrated Hand/Eye Coordination*, by, 1999 International Conference on Robotics and Automation (ICRA '99), pp. 1607-1613, April 1999.

Dodds, Z., Jagersand, M., Toyama, K., and Hager, G. D. *A Hierarchical Vision System for Robotic Manipulation*, by Z. Dodds, M. Jagersand, K. Toyama, and G. D. Hager, 1999 International Conference on Vision Systems (ICVS '99), LNCS 1542, pp. 312-330, Jan. 1999.

Hespanha, J., Dodds, Z. Hager, G. D., and Morse, A. S. *Decidability of Robot Positioning Tasks Using Stereo Vision Systems,* 37th IEEE Conference on Decision and Control (CDC '98), pp. 3736-3741, Dec. 1998.

Hespanha, J., Dodds, Z., Hager, G. D., and Morse, A. S. *What can be Done with an Uncalibrated Stereo System?*, 1998 International Conference on Robotics and Automation (ICRA '98), pp. 1366-1372, July 1998.

Dodds, Z. and Hager, G. D. *A Projective Framework for Constructing Accurate Hand-Eye Systems*, IROS 1997 Workshop on New Trends in Image-Based Robot Servoing, pp. 71-82., September 1997.

Dodds, Z. and Hager, G. D. *A Color Interest Operator for Landmark Selection*, 1997 Conference of the American Association for Artificial Intelligence (AAAI '97), pp. 655-660, July 1997.

Hespanha, J., Dodds, Z. Hager, G. D., and Morse, A. S. *What can be Done with an Uncalibrated Stereo System?* The Confluence of Vision and Control: Proceedings of the 1996 Block Island Workshop on Vision and Control, Springer LNCIS 1998, pp. 79-89.

Other publications

Z. Dodds. *Ask a Prof: Energy at HMC*, The Muddraker, Volume XVIII, Issue II, February 2009, p 4.

Z. Dodds. *If CS for Scientists == CS 1:* In *Proceedings, 2007 Microsoft Research Workshop on Computational Education for Scientists*, Sep. 27, 2007, Seattle, WA, Microsoft Corp, pp. 27-8.

T. Barkowsky, P. Bruza, Z. Dodds, et al. *AAAI 2007 Spring Symposium Series Reports*. AI Magazine pp. 94-99. Fall 2007, AAAI Press.

P. Rybski, J. Forbes, D. Burhans, Z. Dodds, P. Oh, M. Scheutz, and B. Avanzato. *The AAAI 2006 Mobile Robot Competition and Exhibition*. AI Magazine pp. 101-110. Summer 2007, AAAI Press. *The 2004 AAAI Spring Symposium Series*, by L. Canamero, Z. Dodds, et al., AI Magazine, 25(4): Winter 2004, pp. 95-100.

Z. Dodds. Task Specification Languages for Uncalibrated Visual Servoing, Ph.D. Thesis, Yale University Department of Computer Science, May 2000.

Z. Dodds and G. D. Hager. *On Accurate Performance of Metrical Tasks with Inaccurately Calibrated Vision Systems*, Technical Report, Yale University Department of Computer Science, 1996.

Failed grant proposals

[NSF proposal] *Uncommon Robotic Simulation for the Common Computer Science Major* – I was a co-PI to PI Frank Klassner of Villanova University on this NSF DUE CCLI Phase 2 proposal submitted January 15, 2009, which was a resubmit from 2008! Total requested funds were $457,916.

[NIH proposal] Along with PI John Milton (CMC) and co-PI Amy Rudenskaya (POM), I was a co-PI on the submitted grant *Complex dynamics, delays and noise in neural control* for $1,441,430 over five years. This proposal was unsuccessful in May, 2006.

Grants Awarded and other funded projects

NSF awards

[$797,692] co-PI on award #0939149 *Modular CS1 from the Inside Out: Computational Thinking for all STEM Students* with C. Alvarado (PI), R. Libeskind-Hadas (co-PI), and G. Kuenning (co-PI). 2009-2012

[$133,133] PI on award #0536173 *Laptop Robotics: Expanding students' access and robots' applications by mobilizing existing resources*. 2006-2009

[$132,252] PI on award #0411176 *From Toys to Tools: Broadening the Reach of the Next-Generation Robotics Laboratory* with co-PI J. Marshall (Pomona College). 2004-2006

Other awards

[Rose Hills] award of $6000 for *An Autonomous Cartographer*, summer 2009 with Anatole Paine.

[WPI] award of $1500 for the development and presentation of the entry by A. Paine (HMC '11) and S. Lakhani (HMC '11) to the *Robotics Innovations Competition and Conference*, Worcester, MA. 11/7-8/2009.

[CMU] award of two Chiara hexapod robots ($4000) from Carnegie Mellon University, Jan. 2009.

[IPRE] July, 2008 awarded $10,000 in order to undertake research with the Myro/Fluke/Scribbler platform in the summer of 2008.

[AAAI] a *travel grant* of $1000 awarded for the participation in AAAI robot exhibition and competition, July 2008, Chicago, IL with three HMC students.

[Leeds] the Leeds foundation awarded $2500 for travel to the April, 2009 Tapia Conference in Portland, OR with three students in order to present and compete at the robot competition there.

[ACM] awarded $400 to H. Hoersting (HMC '10) for our work at the ACM SAC '09 conference. In the end, personal reasons made her use of these funds impossible.

[ICRA] a travel grant of $900 was awarded to assist with Ben Tribelhorn's travel to the International Conference on Robotics and Automation in Rome, April 10-14, 2007.

[sponsorship] of $1000 awarded by Surveyor Robotics and K-Team Robotics in order to sponsor a participant lunch at the AAAI 2007 spring symposium *Robots and Robot Venues: Resources for AI Education* in March, '07 in Palo Alto, CA.

[AAAI] a *travel grant* of $1000 awarded for the participation in AAAI robot exhibition and competition, July 2006, Boston, MA with HMC student B. Tribelhorn.

[SIGCSE] a $200 lodging award at SIGCSE 2007 to present the workshop *A Hands-on Exploration of Educational Robotics* (Covington, KY)

[sponsorship] of $1000 awarded to Topper Kain (HMC '07) to support our work with the PowerWheels vehicles in CS 154 (Robotics) that spring

[Mellon] a $6,800 Mellon Career Enhancement Award entitled *Laptop Robotics: Preserving a low-cost resource for education and research*. This project funded hardware-related work that fall in Pittsburgh and led to the 2006 NSF proposal.

[Mellon] a $5,870, Mellon Career Enhancement award entitled *Bringing Hardware into CS Robotics*, 2/17/2004-9/15/2004.

[sponsorship] of $1000 by KTeam Robotics to support the AAAI spring symposium *Accessible, Hands-on AI and Robotics Education* 3/23/2004, Stanford University.

[Mellon] a $4,000, Mellon Career Enhancement Award, written with Marianne DeLaet for the HMC Teaching and Learning Committee, spanning 4/1/2004-5/30/2005, entitled *Teaching Outside the Box: Faculty Forums for Science, Technology, and Society for Undergraduate Scientific Education*

[HMC] a $5,000 HMC Curriculum Development award entitled *From Core CS to Core Computation*, 6/1/2003-9/1/2003.

[HMC] a $5,000 HMC Diversity Support award entitled *An Inreach program with Pomona High School*, 6/1/2003-9/1/2003.

[Beckman] a $10,500 Beckman research grant entitled *Accurate Maps from Inaccurate Data*, 6/1/2002-9/1/2002.

Projects in service to the academic community and to HMC

Co-authored *Experiential learning at HMC*, the curriculum committee's WASC report, 2007-2009
Co-authored the HMC strategic vision chapter on *Optimizing HMC's Impact on Society*, 2006-2007
Co-authored the *CS Departmental Evaluation*, the department's evaluation of 2005-2006
Co-created Bio/CS 6, *an Introduction to Biology and Computer Science*, running now in 2009-2010

NSF CAREER review panels: 2008, 2009
NSF DUE review panels (various programs): 2005, 2006, 2007, 2008

Yearly reviewer for
- SIGCSE – CS education's largest annual conference in the US.
- ITiCSE – a smaller, international conference with goals similar to SIGCSE
- CCSC – the CS education community's regional conferences (various regions)
- CVPR – the computer vision community's annual conference, usually in the US
- ICRA – the robotics community's largest annual conference
- IROS – the robotics community's second largest annual conference
- FLAIRS – a regional and long-running Artificial Intelligence conference held in Florida
- AAAI's Spring Symposia – the AAAI's annual symposium series held at Stanford University

Ad-hoc reviewer for textbooks:
- *Practical Programming: An introduction to CS using Python*

Ad-hoc reviewer for journals:
- *Autonomous Robotics*
- *Transactions on Control Systems Technology*
- *Transactions on Autonomous and Adaptive Systems*
- *Transactions on Computing Education*

Committee service:
- Chair, HMC research committee, 2009-2010
- Member, HMC research committee, 2007-2009
- Chair, HMC curriculum committee, 2006-2007
- Member, HMC teaching and learning committee, 2003-2006
- Member, HMC Aeronautical Scholars committee, 2004- (ongoing)
- various departmental committees

Advising:
- Yearly participation as a first-year advisor
- Fall 2008: co-taught the *Seminar on Robotics: Hardware and Software* with Prof. Sarah Harris
- Customary advising of CS majors

Presentations, tours, and outreach from the robotics lab
- Admitted students day
- FAST demonstration day

Summer Institute academic preparation for CS
On-campus day
ad-hoc occasions
Claremont schools' annual robot competition, judges' coordinator (HMC students judge)
Claremont High School outreach program: *Biology Rules!* with Prof. Ran Libeskind-Hadas