

## *Curriculum Vitae*

### **Brian M. Scassellati**

Associate Professor  
Department of Computer Science  
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#### **Research Interests**

My research focuses on the construction of humanoid robots that interact with people using natural social cues. These robots are used both to evaluate models of how infants acquire social skills and to assist in the diagnosis and quantification of disorders of social development (such as autism). My other interests include active vision systems, visual-motor coordination, developmental models, social learning (imitation and mimicry), and applications of robotics as a tool for cognitive science.

#### **Education**

- May 2001 Ph.D., Computer Science, Massachusetts Institute of Technology  
Dissertation: *Foundations for a Theory of Mind for a Humanoid Robot*  
Committee: Rodney Brooks (chair), Leslie Pack Kaelbling, W. Eric L. Grimson
- May 1995 M.Eng., Computer Science and Electrical Engineering, Massachusetts Institute of Technology  
Thesis: *High-Level Perceptual Contours from a Variety of Low-Level Sources*
- May 1995 Bachelor of Science, Computer Science, Massachusetts Institute of Technology
- May 1995 Bachelor of Science, Brain and Cognitive Science, Massachusetts Institute of Technology

#### **Research Positions**

- 6/06- Associate Professor, Department of Computer Science, Yale University
- 9/01-6/06 Assistant Professor, Department of Computer Science, Yale University
- 7/01-8/01 Postdoctoral associate, MIT Artificial Intelligence Laboratory
- 5/94-6/01 Research Assistant, MIT Artificial Intelligence Laboratory
- 6/93-8/93 Intern, IBM Almaden Research Center, San Jose, CA
- 6/92-8/92 Intern, IBM Almaden Research Center, San Jose, CA

#### **Teaching**

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|---|------------------|-----------------|
| <i>CS 201a : Introduction to Computer Science</i> | Fall, 2005, 2006 | Yale University |
| <i>CS 473b : Intelligent Robotics</i>             | Spring 2002-7    | Yale University |
| <i>CS 470a : Artificial Intelligence</i>          | Fall 2002, 2003  | Yale University |
| <i>CS 673a : Social Robotics</i>                  | Fall 2001        | Yale University |

## Professional Activities

- Program Chair, 4<sup>th</sup> *ACM/IEEE International Conference on Human-Robot Interaction*, 2009
- Program Chair, 7<sup>th</sup> *IEEE International Conference on Development and Learning*, 2008
- Chairman, *Autonomous Mental Development Technical Committee*, IEEE Computational Intelligence Society (formerly Neural Networks Society). 2006-2007
- Program Chair, 6<sup>th</sup> *IEEE International Conference on Development and Learning*, 2007
- Associate editor for the *International Journal of Humanoid Robotics*
- Graduate student invitational research workshop on human-robot interaction. One of six faculty members for an NSF-sponsored training workshop. Carmel, CA. August 3-5, 2006.
- Guest Editor, *International Journal of Humanoid Robotics*, special issue on Autonomous Mental Development, with John Weng and Zhengyou Zhang, Vol. 4(2), Spring 2007.
- Program committee member:
  - International Joint Conference on Artificial Intelligence (IJCAI) 2007
  - Human-Robot Interaction (HRI) 2007, 2008
  - The 2nd International Conference on Development and Learning (ICDL'02)
  - First International Workshop on Epigenetic Robotics: Modeling Cognitive Development in Robotic Systems, Lund, Sweden, September 2001.
  - Society for Adaptive Behavior workshop on Socially Situated Intelligence, Zurich, 1998.
- Grant Review Panels (recent)
  - NSF Engineering Research Center site visit review (2005, 2006)
  - NSF panels (2003, 2004, 2005, 2007)
  - U.S. Dept. of Education, National Institute on Disability and Rehabilitation Research panel (2007)
  - European Commission's IST Program (2006)
  - Natural Sciences and Engineering Research Council of Canada (NSERC 2006)
  - French National Research Agency, Agence Nationale de la Recherche (ANR 2006)
  - Netherlands Organization for Scientific Research (NOW, 2005)
  - Förderung der wissenschaftlichen Forschung (the Austrian national science council, 2003)
- Reviewer for:
  - Journals (last 5 years):
    - Artificial Intelligence Journal*
    - Trends in Cognitive Science*
    - Behavioral and Brain Sciences*
    - Robotics and Autonomous Systems*
    - Autonomous Robotics*
    - Journal of Infant and Child Development*
    - IEEE Transactions on Robotics and Automation*
    - IEEE Transactions on Systems, Man, and Cybernetics*
    - IEEE Transactions on Neural Networks*
    - IEEE Transactions on Evolutionary Computation*
    - IEEE Transactions on Pattern Analysis and Machine Intelligence*
    - IEEE Transactions on Robotics and Automation*
    - Neurocomputing*
    - Assistive Technology*
    - Adaptive Behavior*
    - Neural Networks*
    - Computers and Industrial Engineering*
    - Cognitive Systems Research*

Conferences (last 5 years):

American Association of Artificial Intelligence (AAAI) 2007, 2006, 2005

Robotics: Systems and Science 2007, 2006, 2005

IEEE-RAS International Conference on Humanoid Robotics 2007, 2006, 2005, 2004

International Joint Conference on Artificial Intelligence (IJCAI) 2007, 2005, 2003, 2001

Epigenetic Robotics (EpiRob) 2006, 2005, 2004, 2003

IEEE International Conference on Intelligent Robots and Systems (IROS) 2004, 2007

IEEE International Conference on Robotics and Automation (ICRA) 2005

IEEE Conference on Evolutionary Computation (CEC) 2007

International Joint Conference on Neural Networks (IJCNN) 2006, 2003

Cognitive Science (CogSci) 2007, 2002

International Conference on Development and Learning (ICDL) 2006, 2005, 2004, 2003

- Co-organizer of the special session “Autonomous mental development” at the IEEE World Congress on Computational Intelligence (WCCI-2006)
- Editorial board for the journal *Interaction Studies*
- 2001 Workshop Chair for the American Association of Artificial Intelligence (AAAI) Mobile Robot Workshop and Competition. Also served as the editor for a collection of papers from this workshop which was published by AAAI Press.
- 2001: Planning committee member for the MIT Initiative on Technology and Identity.
- 2001: Organizing committee member for AAAI Fall Symposium "Parallel Cognition for Embodied Agents".
- 1999-2000: Planning committee member for the MIT Museum exhibit on Artificial Intelligence.
- 1998-1999: Co-organizer for the seminar series "Brains and Machines" jointly hosted by the MIT Artificial Intelligence Laboratory and the MIT Center for Biological and Computational Learning.

**Yale University Activities**

- Graduate admissions committee, 2002-2007.
- Departmental computing committee 2006-2007
- Coordinator for first year graduate students, Department of Computer Science, 2002-2005.
- Freshman Advisor, Morse College, 2001-2007.

## Honors and Awards

- 2007: Alfred P. Sloan Research Fellowship
- 2007: Best Paper Award, 6<sup>th</sup> International Conference on Development and Learning (ICDL)
- 2006: Best Applied Computational Modeling Paper, 28th Annual Meeting of the Cognitive Science Society
- 2006: Guest speaker at the Annual Meeting of the National Academy of Sciences
- 2005: Keynote Speaker, 5th International workshop on Epigenetic Robotics
- 2004: Best Paper Award at the 3<sup>rd</sup> International Conference on Development and Learning (ICDL)
- 2004: Part of an NSF Science and Technology Center proposal that has entered the final phase of competition. From an initial field of more than 150 proposals, only 10 reached this final stage.
- 2003: NSF CAREER Award
- 2002: Selected as one of two nominees from Yale for the Packard Foundation Fellowship
- 2000: Best Paper Award at the First International IEEE/RSJ Conference on Humanoid Robotics
- 1995-8 National Defense Science and Engineering Graduate Fellowship
- 1995 Morris Joseph Levin Memorial Award for Best Oral Thesis Presentation
- 1994-5 Bose Foundation Fellowship
- 1993 Cray Research Scholarship
- Member of Phi Beta Kappa, Eta Kappa Nu, Tau Beta Pi, Sigma Xi

## Recent Media Coverage

For five years, we have been routinely declining media interviews due to the nature of our clinical research. We have made only a few exceptions to this policy.

- National Public Radio, interview by Faith Middleton for "All Things Considered." Airdate TBA.
- New York Times Magazine, "It Understands," July 29, 2007.  
<http://www.nytimes.com/indexes/2007/07/29/magazine/index.html>
- SEED magazine, "Rise of Roboethics," July 2007.  
[http://www.seedmagazine.com/news/2007/07/rise\\_of\\_roboethics.php](http://www.seedmagazine.com/news/2007/07/rise_of_roboethics.php)
- New Scientist, "Self-aware robot turns mirror on humankind," May 16, 2007.  
<http://tinyurl.com/ysfwxz>
- APA Monitor on Psychology, "R2-D2's Social Lessons," Vol. 38(3), March 2007.  
<http://www.apa.org/monitor/mar07/r2d2.html>
- Popular Science, "Today's 5 most mind-blowing 'bots," September 2006.  
<http://tinyurl.com/yvqcqu>
- Wall Street Journal, "Smart robotic toys may one day diagnose autism at early age", Page B-1, October 26, 2005. Reprinted here: <http://www.post-gazette.com/pg/05299/595326.stm>

## Invited talks

- Society for Research in Child Development (SRCD) Biennial Meeting, 3/30/07.
- Keynote speaker, AAAI Spring Symposium on Multidisciplinary Collaboration for Socially Assistive Robotics, 03/27/07.
- Harvard University, Electrical Engineering Seminar series, 03/16/07.
- University of Missouri, CS Departmental Seminar, 02/27/07.
- Chicago Humanities Festival, 11/11/06.
- Robotics: Systems and Science workshop on "Socially Assistive Robotics". 8/19/06.
- University of Massachusetts Lowell, CS Departmental seminar, 4/19/06.
- **National Academy of Sciences**, Annual Meeting, 4/24/06.
- Massachusetts Institute of Technology, CSAIL Robotics Seminar, 11/29/05
- Doing Likewise: A Day-Long Symposium exploring issues surrounding imitation, emulation and mimesis presented by the New York Institute for the Humanities at NYU, and moderated by Jonathan Miller, 11/19/05
- Workshop on Physical Robot Appearance and Design for Next Generation Human-Robot Interaction Systems, USC, 11/16/05
- Carnegie Mellon University, Robotics Institute Colloquium, 11/11/05
- **National Academy of Sciences** Frontiers of Science Symposium, 10/26/05. (This was one of three talks in a session on robot learning. This session was selected out of all others for presentation t the Annual meeting on 4/24/06).
- Psychology Lunch, Department of Psychology, Yale University, 9/7/05
- **Keynote Speaker**, 5<sup>th</sup> International workshop on Epigenetic Robotics, 7/23/05
- Yale Systems Science Seminar Series, 2/11/05
- Central Connecticut University Computer Science Seminar Series, 2/9/05
- United States Army Logistics Transformation Agency, Telerobotics and Energy Conference, 8/11/2004
- International Conference on Infant Studies (ICIS), 5/5/2004
- Yale High Performance Computing Initiative, 4/30/2004
- Washington University, Computer Science Colloquium, 4/9/2004
- Lecture and laboratory tour as part of the International Festival of Arts and Ideas. Approximately 120 people toured the Social Robotics lab in AK Watson Hall during this event. 06/2003
- NSF Neuromorphic Engineering Conference, Telluride, Colorado, 07/17/2003.
- International Joint Conference on Neural Networks (invited), 07/15/2003.
- Artificial Intelligence and Transhumanism working group, Yale Bioethics project, 09/12/03.
- Yale-New Haven Community open house. Lecture accompanied by a lab tour that was open to the public. Approximately 150 people toured our laboratory in AK Watson during this event. 11/08/2003.
- Cognitive Science Colloquium, Southern Illinois University, Carbondale, 11/15/02.
- the festival Le Reve de Vaucanson (The Dream of Vaucanson), Musee de Arts et Metries, Paris, 10/17/02.
- 2nd workshop on Robotic and Virtual Interactive systems in the Therapy of Autism and other psychopathological disorders, Hopital La Salpetriere, Paris, 9/27/02.
- Morse College Fellows meeting, 9/23/02.
- Yale Alumni weekend, 6/02/02.
- Pierce Laboratory weekly seminar, Yale School of Medicine, 5/20/02.
- Yale Entrepreneurial Society Panel Discussion, 4/19/02.

- Artificial Intelligence and Transhumanism working group, Yale Bioethics project, 2/11/02.
- Psychology Lunch, Department of Psychology, Yale University, 1/23/02.
- DARPA Human-Machine Interface workshop, San Luis Obispo, California, 9/01.
- Fourteenth Annual Government Technology Conference in Albany, NY, 11/01.
- Japanese Ministry of Science and Technology workshop on development and cognition of humans and artifacts in Kyoto, Japan, 10/01.
- Plenary talk at "Computation for Metaphors, Analogy and Agents" workshop at the University of Aizu, Aizu-Wakamatsu, Japan. 6/98.

**Guest lectures**

- Yale CogSci 110, *Introduction to Cognitive Science*, Fall 2001-2006
- Yale CS 470, *Artificial Intelligence*, October, 2001
- MIT summer professional course *Embodied Intelligence*. August 1999.
- MIT course 6.892 *Embodied Intelligence*. April-May, 2000, also in 1999, 1997, and 1996.

## Publications

### Refereed Journal Publications

- Pitfalls in the modeling of developmental systems, with F. Shic. *International Journal of Humanoid Robotics*, Vol. 4(2), p. 435-454. 2007.
- The grand challenges in socially assistive robotics, with A. Tapus and M. Mataric. *IEEE Robotics and Automation Magazine*. Vol. 4, No. 1. p. 35-42, March 2007.
- A behavioral analysis of robotic models of visual attention, with F. Shic. *International Journal of Computer Vision*, Vol. 73(2), p. 159-177, 2007.
- Learning acceptable windows of contingency, with Kevin Gold. *Connection Science, special issue on developmental learning*, Vol. 18(2), p. 217-228, June 2006.
- Social Development, with C. Crick, K. Gold, E. Kim, F. Shic and G. Sun. *IEEE Computational Intelligence Magazine*, Vol. 1(3), p. 41-47, August 2006.
- A fast and efficient model for learning to reach, with Ganghua Sun. *International Journal of Humanoid Robotics*, Vol. 2, No. 4, p.391-413, 2005.
- Robots that imitate humans, with C. Breazeal. *Trends in Cognitive Science*, vol. 6, pp. 481-487, 2002.
- Active vision for sociable robots, with C. Breazeal, A. Edsinger, and P. Fitzpatrick. *IEEE Transactions on Systems, Man, and Cybernetics, Part A: Systems and Humans*, Volume 31, Number 5, p. 443-453, 2002.
- Theory of mind for a humanoid robot. *Autonomous Robots*, vol. 12, p. 13-24, 2002.
- Humanoid robots: A new kind of tool, with B. Adams, C. Breazeal, and R. Brooks. *IEEE Intelligent Systems*, Vol. 15, No. 4, p. 25-31, July/August 2000.
- Social constraints on animate vision, with C. Breazeal, A. Edsinger, P. Fitzpatrick, and P. Varchavskaia. *IEEE Intelligent Systems*, Vol. 15, No. 4, p. 32-37, July/August 2000.
- Infant-like social interactions between a robot and a human caretaker, with C. Breazeal. Accepted for publication in *Adaptive Behavior* in 2000, available from <http://www.cs.yale.edu/~scasz/>.

#### In submission:

- A Demonstration of the Efficiency of Developmental Learning, with M. Doniec and G. Sun. *International Journal of Humanoid Robotics*.
- Learning Grounded Semantics from Real-World Context Using Extension Inference and Vocabulary Trees, with K. Gold. *Artificial Intelligence Journal*.

### Refereed Conference Proceedings

- A Bayesian Robot that Distinguishes “Self” from “Other”, with K. Gold. In *Proceedings of the 29th Annual Meeting of the Cognitive Science Society (CogSci2007)*. Nashville, Tennessee.
- A robot that uses existing vocabulary to infer non-visual word meanings from observation, with K. Gold. In *Proceedings of the Twenty-Second Annual Meeting of the Association for the Advancement of Artificial Intelligence (AAAI-2007)*. Vancouver, BC, Canada. August, 2007.
- Learning Grounded Semantics With Word Trees: Prepositions and Pronouns, with K. Gold and M. Doniec. In *Proceedings of the 6<sup>th</sup> IEEE International Conference on Development and Learning (ICDL 2007)*, London, England, July 2007. **BEST PAPER AWARD.**
- Who is IT? Inferring Role and Intent from Agent Motion, with C. Crick and M. Doniec. In *Proceedings of the 6<sup>th</sup> IEEE International Conference on Development and Learning (ICDL 2007)*, London, England, July 2007.
- Measuring context: The gaze patterns of children with autism evaluated from the bottom-up, with F. Shic, K. Chawarska, and D. Lin. In *Proceedings of the 6<sup>th</sup> IEEE International Conference on Development and Learning (ICDL 2007)*, London, England, July 2007.
- Learning to refine behavior using prosodic feedback, with E. Kim. In *Proceedings of the 6<sup>th</sup> IEEE International Conference on Development and Learning (ICDL 2007)*, London, England, July 2007.

- Emergence of Language-Specific Phoneme Classifiers in Self-Organized Maps, with Marek Doniec and W. L. Miranker. In *Proceedings of the 2007 International Joint Conference on Neural Networks (IJCNN-07)*. Orlando, Florida, August 2007.
- The future of HRI: Maps of the Field and Future Directions, K. Gold with I. Fasel, N. Freier, and C. Torrey. *2<sup>nd</sup> Annual Conference on Human-Robot Interaction (HRI-07)*.
- Active Learning of Joint Attention, with M. Doniec and G. Sun. *IEEE/RSJ International Conference on Humanoid Robotics (Humanoids 2006)*, Genoa, Italy, 2006.
- Deictic Pronoun Learning and mirror self-identification, with K. Gold. *6<sup>th</sup> International Conference on Epigenetic Robotics (EpiRob)*, Paris, 2006.
- Synchronization in social tasks: Robotic drumming, with C. Crick. *15th IEEE International Symposium on Robot and Human Interactive Communication, (RO-MAN)*. Reading, UK. 2006.
- Swimming in the Underlying Stream: Computational Models of Gaze in a Comparative Behavioral Analysis of Autism, with F. Shic. *Cognitive Science*, Vancouver, 2006. **BEST PAPER AWARD: Best Applied Computational Modeling Paper**
- Audio Speech Segmentation Without Language-Specific Knowledge, with K. Gold. *Cognitive Science*, Vancouver, 2006.
- How Not to Evaluate a Developmental System, with F. Shic. *International Joint Conference on Neural Networks (IJCNN)*, Vancouver, 2006.
- A Demonstration of the Efficiency of Developmental Learning, with M. Doniec and G. Sun. *International Joint Conference on Neural Networks (IJCNN)*, Vancouver, 2006.
- Grounded Pronoun Learning and Pronoun Reversal, with K. Gold. *6<sup>th</sup> International Conference on Development and Learning (ICDL-06)*, Bloomington, IN. 2006.
- A Learning System for the Perception of Animacy, with V. Gaur. *6<sup>th</sup> International Conference on Development and Learning (ICDL-06)*. Bloomington, IN. 2006.
- Using context and sensory data to learn first and second person pronouns, with K. Gold. *1st Annual Conference on Human-Robot Interaction (HRI-06)*.
- Effects of head movement on perceptions of humanoid robot behavior, with E. Wang, C. Lignos, and A. Vatsal. *1st Annual Conference on Human-Robot Interaction (HRI-06)*.
- Using robots to study abnormal social development. *Fifth International Workshop on Epigenetic Robotics (EpiRob)*. Nara, Japan. July 2005.
- How social robots will help us to diagnose, treat, and understand autism. *12<sup>th</sup> International Symposium of Robotics Research (ISRR)*. San Francisco, CA. Oct. 2005.
- Quantitative metrics of social response for autism diagnosis, *14<sup>th</sup> International Workshop on Robot and Human Interactive Communication (ROMAN)*. Nashville, TN. Aug. 2005.
- Exploiting vestibular output during learning results in naturally curved reaching trajectories, with G. Sun. *5<sup>th</sup> International Workshop on Epigenetic Robotics (EpiRob)*. Nara, Japan. July 2005.
- Reaching through learned forward models, with G. Sun. *2004 IEEE-RAS/RSJ International Conference on Humanoid Robots (Humanoids 2004)*. Los Angeles, CA. Nov. 2004.
- Encounters with Kismet and Cog, with S. Turkle, O. Daste, and C. Breazeal. *2004 IEEE-RAS/RSJ International Conference on Humanoid Robots (Humanoids 2004)*. Los Angeles, CA. Nov. 2004.
- How to use anthropomorphic robots to study social development. *14<sup>th</sup> Biennial International Conference on Infant Studies (ICIS)*. Chicago, IL. Aug. 2004.
- Using a robot to reexamine looking time experiments, with A. Lovett. *4<sup>th</sup> International Conference on Development and Learning (ICDL)*. San Diego, CA. Aug. 2004. **BEST PAPER AWARD.**
- Robotic self-recognition, with P. Michel and K. Gold. *2004 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*. Sendai, Japan. Sept. 2004.
- Prosody recognition in male infant-directed speech, with A. Robinson-Mosher. *2004 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*. Sendai, Japan. Sept. 2004.

- Investigating models of social development using a humanoid robot. *2003 International Joint Conference on Neural Networks (IJCNN)*. Portland, OR. July 2003.
- Theory of mind for a humanoid robot. *1<sup>st</sup> IEEE/RSJ International Conference on Humanoid Robotics (Humanoids 2000)*. Cambridge, MA. Sept. 2000. **BEST PAPER AWARD.**
- Social constraints on animate vision, with C. Breazeal, A. Edsinger, P. Fitzpatrick, and P. Varchavskaia. *1<sup>st</sup> IEEE/RSJ International Conference on Humanoid Robotics (Humanoids 2000)*. Cambridge, MA. Sept. 2000.
- How to build robots that make friends and influence people, with C. Breazeal. *1999 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS-99)*. Kyongju, Korea. Aug. 1999.
- A context-dependent attention system for a social robot, with C. Breazeal. *1999 International Joint Conference on Artificial Intelligence (IJCAI-99)*, Stockholm, Sweden. July 1999.
- Knowing what to imitate and knowing when you succeed. *Annual meeting of the Society for the Study of Artificial Intelligence and Simulation of Behaviour (AISB)*. Edinburgh, Scotland. June 1999.
- Alternate essences of intelligence, with R. Brooks, C. Breazeal, R. Irie, C. C. Kemp, M. Marjanovic, and M. Williamson. *15<sup>th</sup> National Conference on Artificial Intelligence (AAAI-98)*. Madison, WI. Aug. 1998.
- Eye finding via face detection for a foveated, active vision system. *15<sup>th</sup> National Conference on Artificial Intelligence (AAAI-98)*. Madison, WI. Aug. 1998.
- Self-taught visually-guided pointing for a humanoid robot, with M. Marjanovic and M. Williamson. *4<sup>th</sup> International Conference on Simulation of Adaptive Behavior (SAB-96)*, Cape Cod, MA. June 1996.
- Retrieving images by 2D shape: a comparison of computation methods with perceptual judgments, with S. Alexopoulos and M. Flickner. In *Storage and Retrieval for Image and Video Databases II*, SPIE Conference Proceedings, Volume 2185, San Jose, CA, pp. 2-14, 1994.

#### Refereed Workshop Proceedings

- Learning about the self and others through contingency, with K. Gold. *2005 AAAI Spring Symposium "Developmental Robotics."* Stanford, CA. Mar. 2005.
- How robotics and developmental psychology complement each other. *NSF/DARPA Workshop on Development and Learning*. Michigan State University, Lansing, MI. June 2000.
- Investigating models of social development using a humanoid robot. *1998 AAAI Fall Symposium "Robots and Biology: Developing Connections."* Orlando, FL. Oct. 1998.
- Imitation and mechanisms of shared attention: A developmental structure for building social skills. *Autonomous Agents 1998 workshop "Agents in Interaction - Acquiring Competence through Imitation"*. Minneapolis, MO. Aug. 1998.
- Building behaviors developmentally: A new formalism. *1998 AAAI Spring Symposium "Integrating Robotics Research"*. Stanford, CA. Mar. 1998.
- Mechanisms of shared attention for a humanoid robot. *1996 AAAI Fall Symposium "Embodied Intelligence."* Cambridge, MA. Oct. 1996.

#### Refereed Book Chapters

- Challenges in building robots that imitate people, with C. Breazeal. In K. Dautenhahn and C. Nehaniv, eds., *Imitation in Animals and Artifacts*, MIT Press, 2002.
- Investigating models of social development using a humanoid robot. In B. Webb and T. Consi, eds., *Biorobotics*, MIT Press, 2001.

#### Invited Book Chapters

- The Cog Project: Building a humanoid robot, with R. Brooks, C. Breazeal, M. Marjanovic, and M. Williamson. In C. Nehaniv, ed., *Computation for Metaphors, Analogy and Agents, Vol. 1562 of Springer Lecture Notes in Artificial Intelligence*, Springer-Verlag, p. 52-87, 1998.

- Imitation and mechanisms of joint attention: A developmental structure for building social skills on a humanoid robot. In C. Nehaniv, ed., *Computation for Metaphors, Analogy and Agents, Vol. 1562 of Springer Lecture Notes in Artificial Intelligence*, Springer-Verlag, p. 176-195, 1998.

### **Technical Reports**

- Foundations of a theory of mind for a humanoid robot. Ph.D. dissertation, MIT Department of Computer Science and Electrical Engineering. May, 2001.
- A binocular, foveated, active vision system. MIT AI Memo 1628, March 1998.
- High-level perceptual contours from a variety of low-level physical features. Master's Thesis, MIT. 1995.

## Student Supervision

### Graduated Ph.D. students

1. Ganghua Sun. *From Motor Learning to Social Learning: A Study of Development on a Humanoid Robot*. Degree awarded in December, 2006.

### Current graduate students

1. Fred Shic (5<sup>th</sup> year Ph.D.) – Gaze Tracking as a Computational Diagnostic Tool for Autism
2. Kevin Gold (5<sup>th</sup> year Ph.D.) – Self-other Discrimination and Language Learning
3. Christopher Crick (4<sup>th</sup> year Ph.D.) – Recognition of Intent from Motion Trajectories
4. Elizabeth Kim (4<sup>th</sup> year Ph.D.) – Biologically-motivated algorithms for Prosody Recognition
5. Justin Hart (2<sup>nd</sup> year Ph.D.) – topic undecided

### Dissertation committee member for:

1. Yinghua Wu (advisor: Paul Hudak)
2. Chen Xu (advisors: Julie Dorsey and Holly Rushmeier)
3. Jianye Lu (advisors: Julie Dorsey and Holly Rushmeier)

### Current undergraduate research assistants

1. Wilma Bainbridge – Effects of Embodiment on Human-Robot Interaction
2. Erica Newland – Prosody Recognition in Adolescents with Autism

### Master of Science students supervised

1. Marek Doniec (2006-2007) – Joint Attention and Declarative Pointing
2. Viksit Gaur (2005-2006) : Discrimination of Animacy from Visual Cues
3. Jim Logan (2004-2005) : PlayTest: A Diagnostic Audio-Preference Recorder for Home Use
4. Ryan Gehl (2002-2003) : Models of Vocal Prosody
5. Marek Michalowski (2002-2003) : Methods for Modifying Visual Scanning Patterns
6. Shawn Walker (2001-2002) : Construction of an Active Vision System (Mechanical Engineering)

### Special Registration students supervised

1. Marek Doniec (2005-2006) – DAAD scholarship winner (German Academic Exchange Service)
2. Philipp Michel (2003-2004) – DAAD scholarship winner (German Academic Exchange Service)

### Completed undergraduate thesis projects (CS 490 unless noted)

- 2006-2007
  1. Jordan Winnick, *The Design and Construction of a Robot for Use in the Study of Autism* (EECS senior project)
  2. Chris Crane, *The Design and Construction of a Robot for Use in the Study of Autism*.
- 2005-2006
  3. Erica Baller, *The Art of Manipulation*.
  4. Emily Pitler, *Robotic Perception of Causality*.
  5. Emily Wang, *A Model for Learning the Meaning and Usage of Numbers*.
- 2004-2005
  6. Jian Yuan, *Looming and Visual depth perception*
  7. Elizabeth Darbie, *Multi-modal tracking based on isometric views*
  8. Timothy Condon, *The Pirate's Code: Social Choice and Aggregation Methods*.
  9. James Kim, *Pressure-Sensitive Flexible Robotic Skin*.
  10. Reuben Grinberg, *Autistic Spectrum Classification of Gaze Tracking Data*.
  11. Xin Tong, *Gender Recognition in Adult Male and Female Speech*.
- 2003-2004
  12. Vincent Panzano, *Deriving Parameters for a Visual Attention Models from Human Gaze Patterns*, (Cognitive Science senior essay).
  13. Andrew Lovett, *Using a robot to re-examine human looking time experiments*, (Cognitive Science senior essay).
  14. Adam Cushner, *ViSITAR: Visual Surveillance and Interaction Tracking for Autism Research*.
  15. Byron Igoe, *The Bigger Picture: Relating Visual and Auditory Cues to Develop the Beginnings of a Mind's Eye*.
  16. Bertrand Maher, *Building a Device for Testing Listening Preferences of Autistic Children*.
- 2002-2003
  17. Jeffrey Kinsey, *Automating Word Segmentation of Phonemic Transcriptions*, co-advised with Charles Yang.
  18. Andrew Lovett, *ILAB: Infant-Like Attentional Behavior*.
  19. Avi Robinson-Mosher, *Prosody Recognition in Male Infant-Directed Speech*.
  20. Joseph Dvorkin, *Deducing Intent of Unidentified Objects*.
  21. Ross Eaton, *ViSIT: Visual Surveillance and Interaction Tracking*.
  22. Stephen Elliott, *Toward a Visual Attention Memory System (VAMS)*.
  23. Daniel Grollman, *Glwys, the robotic rat*.
  24. Manfred Lau, *A System for Auditory Localization*.

25. Hanlin Qian, *Computational Modeling of Human Attention in Multiple Object Tracking*.
- 2001-2002
26. Kushal Dave, *Using cluster analysis to automatically thread discussion board messages*, co-advised with Charles Yang.
27. Adam Ecker, *Models of the Motor Theory of Speech Recognition*, Psychology.
28. Matthew Herberg, *Development of a Vision System for a Humanoid Robot*.
29. Max Kushner, *Making Robots More Human(e)*.
30. James Stuart, *GWTSim: Grey Walter Tortoises in Complex Environs*.
31. Marek P. Michalowski, *A Machine Learning System for Identifying Animate Motion*.