# Justin W. Hart


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## Education

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|---|---|
| December 2014 | Ph.D., Computer Science, Yale University<br>Dissertation: *Robotic Self-Modeling*<br>Committee: Brian Scassellati (Advisor), Steven W. Zucker<br>Aaron Dollar (Mechanical Engineering), Chad Jenkins (Brown University) |
| May 2010 | M.Phil., Computer Science, Yale University |
| May 2008 | M.S., Computer Science, Yale University |
| January 2006 | M.Eng., Computer Science, Cornell University |
| May 2001 | B.S., Computer Science (Cum Laude), West Virginia University |

## Research Positions

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| 12/16 - Present | Postdoctoral Fellow, Department of Computer Science, University of Texas at Austin |
| 11/14 - 12/16 | Postdoctoral Fellow, Department of Mechanical Engineering, University of British Columbia |
| 09/13 - 11/14 | Visiting Scholar, Department of Mechanical Engineering, University of British Columbia |
| 09/06 - 12/14 | Ph.D. Candidate, Department of Computer Science, Yale University |
| 06/05 - 09/06 | Research Assistant, Intelligent Information Systems Institute, Cornell University |

## Teaching Assistantships

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|---|---|---|
| *CPSC 473/573 Intelligent Robotics* | Spring 2008 - 2010 | Yale University |
| *CPSC 671 Advanced Artificial Intelligence* | Fall 2009 | Yale University |
| *CPSC 112 Introduction to Programming* | Fall 2011 | Yale University |

## Industry Experience

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| 12/01 - 12/04 | Software Engineer, SFA, Incorporated |

## Publications

### Journal Articles (Peer-reviewed)

**J1** W. A. Bainbridge, J. W. Hart, E. S. Kim, and B. Scassellati. The benefits of interactions with physically present robots over video-displayed agents. (2010) *International Journal of Social Robotics*. vol. 3(1), p.41-52

### Conference Publications (Peer-reviewed)

**C1** J. W. Hart and B. Scassellati. Mirror Perspective-Taking with a Humanoid Robot. In *Proceedings of the 26th AAAI Conference on Artificial Intelligence (AAAI-12)*. Toronto, Canada, July 2012. (Acceptance rate: 26%)

**C2** J. W. Hart and B. Scassellati. A Robotic Model of the Ecological Self. In *Proceedings of the 11th IEEE-RAS International Conference on Humanoid Robots (HUMANOIDS 2011)*. Bled, Slovenia, October 2011.

**C3** E. Avrunin, J. W. Hart, A. Douglas, and B. Scassellati. Effects Related to Synchrony and Repertoire in Perceptions of Robot Dance. In *Proceedings of the 6th ACM/IEEE International Conference on Human-Robot Interaction (HRI 2011)*. Lausanne, Switzerland, March 2011. (Acceptance rate: 22%)

**C4** E. Short, J. W. Hart, M. Vu, and B. Scassellati. No Fair!! An Interaction with a Cheating Robot. In *Proceeding of the 5th ACM/IEEE International Conference on Human-Robot Interaction (HRI 2010)*. Osaka, Japan, March 2010. (Acceptance rate: 21%, Nominated for Best Paper)

**C5** W. A. Bainbridge, J. W. Hart, E. S. Kim, and B. Scassellati. The Effect of Presence on Human-Robot Interaction. In *Proceedings of the 17th IEEE International Symposium on Robot and Human Interactive Communication (ROMAN)*. Munich, Germany, August 2008.

**C6** A. Sabharwal, C. Ansotegui, C. P. Gomes, J. W. Hart, and B. Selman. QBF Modeling: Exploiting Player Symmetry for Simplicity and Efficiency. In *Proceedings of the 9th International Conference on Theory and Applications of Satisfiability Testing (SAT-06)*. Seattle, WA, USA, August 2006.

### Workshop Papers

**W1** J. W. Hart, Sheikholeslami, M. K. X. J. Pan, W. P. Chan, and E. A. Croft. Predictions of Human Task Performance and Handover Trajectories for Human-Robot Interaction. In *HRI 2015 Workshop on Human-Robot Teaming*. Portland, Oregon, USA, March 2-5, 2015.

**W2** J. W. Hart, B. Gleeson, M. K. X. J. Pan, A. Moon, K. MacLean, and E. A. Croft. Gesture, Gaze, Touch, and Hesitation: Timing Cues for Collaborative Work. In *HRI Workshop on Timing in Human-Robot Interaction 2014*. Bielefeld, Germany, March 3-6, 2014.

**W3** J. W. Hart and B. Scassellati. Robotic Self-Models Inspired by Human Development. In *Proceedings of the AAAI-10 Workshop on Metacognition for Robust Social Systems*. Atlanta, Georgia, USA, July 11, 2010.

**W4** J. W. Hart, B. Scassellati, and S. W. Zucker. Epipolar Geometry for Humanoid Robotic Heads. In *Proceedings of the 4th International Cognitive Vision Workshop*. Santorini, Greece, May 2008.

### Book Chapters

**B1** J. W. Hart S. Sheikholeslami, E. Croft, K. MacLean, F. P. Ferrie, C. Gosselin and D. Laurandeau (2017 - To Appear) Developing Robot Assistants with Communicative Cues for Safe, Fluent HRI. In Abbass, H., Scholz J., and Reid, D. (Eds.). *Foundations of Trusted Autonomy*. Berlin, Germany: Springer.

**B2** J. W. Hart and B. Scassellati. (2014) Robotic Self-Modeling. In Pitt, Jeremy (Ed.). *The Computer After Me*. London, UK: Imperial College Press.

**B3** J. W. Hart and B. Scassellati. (2011) Robotic Models of Self. In Cox, M. T., and Raja, A. (Eds.). *Metareasoning: Thinking about Thinking*. Cambridge, MA, USA: MIT Press.

### Letters & Short Papers

**L1** J. W. Hart, and B. Scassellati. Self-Awareness and Social Competencies. (2010) *AMD NEWSLETTER: The Newsletter of the Autonomous Mental Development Technical Committee*. vol. 12(1), Spring 2015.

## Talks and Posters

### Invited Talks[1]

**I1** J. W. Hart. Robot Self-Modeling and Self-Other Reasoning. *Mensa National Gathering*. Vancouver, BC, Canada, August 1, 2015.

**I2** J. W. Hart. Robot Self-Modeling and Self-Other Reasoning. *UBC Postdoc Talks*. Vancouver, BC, Canada, July 8, 2015.

**I3** J. W. Hart. Learning about people to build better robots. *Creative Mornings: Vancouver*. Vancouver, BC, Canada, May 1, 2015.

**I4** J. W. Hart. Robotic Self-Modeling. *Ideacity*. Toronto, Ontario, Canada, June 2013.

**I5** J. W. Hart. Robotic Self-Modeling. *Society of Manufacturing Engineers Annual Conference*. Baltimore, MD, USA June 2013.

### Conference and Workshop Talks

**T1** J. W. Hart and B. Scassellati. Creating Social Agency. *NSF-JST workshop on Human-Robot Interaction*. Menlo Park, CA, USA, August 2010.

**T2** J. W. Hart, B. Scassellati, and S. W. Zucker. Estimating the Kinematics of Unseen Joints that Affect the Stereo Vision System. *The 4th Annual New England Manipulation Symposium*. Providence, RI, USA, May 2008.

[1]Not including department colloquia

Posters

**P1** J. W. Hart, B. Scassellati, and S. W. Zucker. Calibrating the Eye Motion of a Humanoid Robot. Appeared at *The 7th IEEE International Conference on Development and Learning.* Monterey, CA, USA, August 2008.

**P2** J. W. Hart, E. Avrunin, D. Golub, B. Scassellati, and S. W. Zucker. Incorporating Active Vision into the Body Schema. Appeared at *The 4th ACM/IEEE International Conference on Human-Robot Interaction (HRI 2008).* La Jolla, CA, March 2008.

**P3** J. W. Hart, B. Scassellati, and S. W. Zucker. Epipolar Geometry for Humanoid Robotic Heads. Appeared at *The Third North East Student Colloquium on Artificial Intelligence (NESCAI08).* Ithaca, NY, USA, May 2008.

## Awards & Recognitions

- Society of Manufacturing Engineers Innovation Watch List - 2013

## Reviewing

- The IEEE International Conference on Robotics and Automation (ICRA): 2016, 2017
- Pattern Recognition Letters: 2016
- International Journal of Human-Computer Studies: 2016
- Robotics, Science, and Systems: 2016
- The ACM Conference on Human Factors in Computing Systems (CHI): 2016
- ACM Transactions on Interactive Intelligent Systems (TIIS): 2015
- ASME Journal of Dynamic Systems, Measurement and Control: 2015
- Robotics and Computer Integrated Manufacturing: 2015
- Journal of Intelligent and Robotic Systems (JIRS) Special Issue - Cognitive Robotics Systems: Concepts and Applications: 2015
- ACM Transactions on Interactive Intelligent Systems: 2015
- ICDL-Epirob (formerly ICDL and Epirob): 2015, 2016
- International Journal of Robotics Research (IJRR): 2015
- Journal of Intelligent and Robotic Systems: 2014, 2015
- IEEE International Conference on Automatic Face and Gesture Recognition: 2014
- IEEE International Symposium on Robot and Human Interactive Communication (RO-MAN): 2013, 2016
- The Journal of Human-Robot Interaction (JHRI): 2012 (reviewed for the inaugural issue)

- The International Journal of Humanoid Robotics (IJHR): 2009, 2010, 2011, 2012, 2014, 2015, 2016
- The ACM/IEEE International Conference on Human-Robot Interaction (HRI): 2010, 2011, 2012, 2013, 2014, 2015, 2016
- The International Journal of Social Robotics (SORO): 2010, 2012
- The IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS): 2009, 2012, 2015, 2016
- The International Joint Conference on Artificial Intelligence (IJCAI): 2011
- The International Conference on Development and Learning (ICDL): 2008, 2009, 2010
- The IEEE-RAS International Conference on Humanoid Robots (HUMANOIDS): 2009, 2010
- The International Conference on Epigenetic Robotics (EPIROB): 2009
- The International Journal of Machine Learning Research (JMLR): 2006
- The European Conference on Artificial Intelligence (ECAI): 2006
- The International Conference on Integration of AI and OR Techniques in Constraint Programming for Combinatorial Optimization Problems (CP-AI-OR): 2006

## Graduate Mentoring

**Sara Shiekholeslami & Vidar Skjervy** Conducted study of handover motions, both to interpret human motion and to implement handover motions on robots.

## Undergraduate Mentoring

**Vedanshu Dash & Henry Mak** Constructed materials for study of handover motions.

**Louisa Hardjasa & Alexander Toews** Constructed materials for study on human-robot synchrony during collaborative work. Study to be conducted.

**Eleanor Avrunin & Ashley Douglas** Performed a study on lifelike motion, resulting in conference publication [C3]. Eleanor Avrunin is currently a Computer Science PhD student at Carnegie Mellon University, and a recipient of an NSF GRFP Fellowship.

**Wilma Bainbridge** Performed a study on social presence in Human-Robot Interaction resulting in conference publication [C5] and journal article [J1]. Wilma is currently a PhD student at the Massachusetts Institute of Technology, and a recipient of an NSF GRFP Fellowship.

**Kenny Castaneda & Gabriel Fernandez** Performed a senior project in which they designed and constructed new arms for the humanoid robot, Nico.

**David Golub & Eleanor Avrunin** Performed a research project in which we programmed a robot to learn a model of how cameras on its head move, resulting in poster [P2].

**Justin Kosslyn** Performed a study on reaching and pointing gestures.

**Graham Radman** Performed a senior project in which he reprogrammed the low-level motor drivers controlling the humanoid robot, Nico's motors.

**Elaine Short & Michelle Vu** Performed a study on attributions of agency to a humanoid robot when a robot cheats in a game, resulting in conference publication [C4], which was nominated for best paper. Elaine Short is currently a PhD student at University of Southern California, and a recipient of an NSF GRFP Fellowship.

## Selected Media Coverage

**M1** New Scientist, "Robot learns to recognise itself in the mirror," August 22, 2012.
`http://www.newscientist.com/article/mg21528785.900-robot-learns-to-recognise-itself-in-the-mirror.html`

**M2** BBC News, "Robot learns to recognise itself in mirror," August 23, 2012.
`http://www.bbc.com/news/technology-19354994`

**M3** NBC News, "Robot learns to track itself and the world through a mirror," August 25, 2012.
`http://www.nbcnews.com/technology/futureoftech/robot-learns-track-itself-world-through-mirror-961379`

**M4** Business Standard, "Now, a 'Self-aware' robot that recognises itself in the mirror," August 23, 2012.
`http://tinyurl.com/9txnky7`

**M5** CBS SmartPlanet, "Robot passes one milestone in tests of self-awareness," August 31, 2012.
`http://www.smartplanet.com/blog/science-scope/robot-passes-one-milestone-in-tests-of-self-awareness/13600`

**M6** El Mundo, "Nico, el robot que est aprendiendo a mirarse al espejo," August 29, 2012.
`http://www.elmundo.es/elmundo/2012/08/29/navegante/1346229933.html`

**M7** Yale Graduate School of Arts & Sciences: Graduate School News and Events, "Using Robots to Study Self Awareness," April, 2012.
`http://www.yale.edu/graduateschool/publications/news/201205/computer-science-robots-self-awareness.html`

**M8** GE Focus Forward Films, "Robot," June, 2012.
`http://focusforwardfilms.com/films/41/robot` (Also featured in Google Solve for X.)