

Nick DePalma, Ph.D.

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Research Statement

My research is dedicated to discovering the design principles that lead to fluent interactive embodied agents, and to building autonomous systems that embody those principles using machine learning. My research has led me to the critical challenge of understanding and expressing nonverbal robotic behavior – a topic that goes beyond gesture and facial expression to include the spatio-temporal dynamics and exchanged signalling that leads to fluent human-robot interaction.

Education

- 2017 ■ **Ph.D.** in Media Arts and Sciences, **Massachusetts Institute of Technology**
in Social Robotics.
Thesis: *Bidirectional gaze guiding and indexing in human-robot interaction through a situated robotic architecture.*
Committee: *Cynthia Breazeal, Brian Scassellati, Julie Shah*
- 2010 ■ **M.Sc.** in Computer Science **Georgia Institute of Technology**
Thesis: *Task Transparency in Learning by Demonstration: Gaze, Pointing, and Dialog.*
Committee: *Andrea Thomaz, Mike Stilman*
- 2005 ■ **B.Sc.** in Computer Science **Georgia Institute of Technology**
Magna Cum Laude, Certificate in Nanotechnology

Employment History

- 2020 – ... ■ **Facebook AI Research:** *Visiting Scientist, Robotics* Gesture synthesis methods for robots. Pittsburgh, PA.
- 2018 – 2020 ■ **Samsung Research of America:** *Robotics Research Engineer* focusing on interaction software stack. Focus of research is on a dynamic bayesian model of multi-party turn taking utilizing gaze cues for addressee estimates. Mountain View, CA.
- 2018 ■ **Futurewei Technologies:** *Robotics Software Architect* for undisclosed robotics project. My responsibilities included motor control, perception for robot, and aiding in coordination between other research sites. San Francisco, CA.
- 2010 – 2017 ■ **Massachusetts Institute of Technology:** *Graduate Research Assistant* in the Personal Robotics Group. Responsibilities included conducting experiments in human-robot interaction and designing autonomous behavior to be compatible with human interaction. Cambridge, MA.
Research Focus: The effect of social behavior (bidding and referencing) on human robot interaction outcomes. Main topic of focus: joint attention in dynamic environments. [\[Link\]](#)
- 2008 – 2010 ■ **Georgia Institute of Technology:** *Graduate Research Assistant* in the Socially Intelligent Machines Lab.
Research focus: Robotics, embodied and unembodied agent learning through interaction. Atlanta, GA. [\[Link\]](#)
- 2006 – 2008 ■ **National Instruments:** *Software Engineer* in computer vision group. I performed optimization for an embedded smart camera and advised the scientific computing about how to utilize GP-GPU toolkits. Austin, TX. [\[Link\]](#)
- 2004 – 2006 ■ **Playmotion :** *Software Engineer* Engine design, game design, and computer vision. Atlanta, GA. [\[Link\]](#)

Employment History (continued)

- 1998 **Vger Technologies** : Linux development environment setup prior to package management, website design, and IT. Nashville, TN.
- 1996 – 1997 **Dimension Web Design** : Start-up company when I was 14. Nashville, TN.

Research Publications

Journal Articles

- 1 Phillips, R., Musikanski, L., Manson, M., Bradbury, J., Fraizer, L., Rakova, B., ... Smart, A. (2020). Introduction to the special issue: intersections of artificial intelligence and community well-being. *International Journal of Community Well-Being*, 3(4), 425–435.
- 2 Breazeal, C., DePalma, N., Orkin, J., Chernova, S., & Jung, M. (2013). Crowdsourcing human-robot interaction: new methods and system evaluation in a public environment. *Journal of Human-Robot Interaction*, 2(1), 82–111.
- 3 Cakmak, M., DePalma, N., Arriaga, R. I., & Thomaz, A. L. (2010). Exploiting social partners in robot learning. *Autonomous Robots*, 29(3-4), 309–329.

Conference Proceedings

- 1 DePalma, N., Smith, J., Chernova, S., & Hodgins, J. (2021). Toward a one-interaction data-driven guide: putting co-speech gesture evidence to work for ambiguous route instructions. In *International conference of human robot interaction. late breaking report*. ACM.
- 2 DePalma, N. & Breazeal, C. (2016b). Towards learning through robotic interaction alone: the joint guided search task. In *Proceedings of the artificial intelligence and the simulation of behavior (aisb)*.
- 3 Jung, M. F., Lee, J. J., DePalma, N., Adalgeirsson, S. O., Hinds, P. J., & Breazeal, C. (2013). Engaging robots: easing complex human-robot teamwork using backchanneling. In *Proceedings of the 2013 conference on computer supported cooperative work* (pp. 1555–1566). ACM.
- 4 Chernova, S., DePalma, N., Morant, E., & Breazeal, C. (2011). Crowdsourcing human-robot interaction: application from virtual to physical worlds. In *2011 ro-man* (pp. 21–26). IEEE.
- 5 Cakmak, M., DePalma, N., Arriaga, R., & Thomaz, A. L. (2009). Computational benefits of social learning mechanisms: stimulus enhancement and emulation. In *2009 IEEE 8th international conference on development and learning* (pp. 1–7). IEEE.
- 6 Cakmak, M., DePalma, N., Thomaz, A. L., & Arriaga, R. (2009). Effects of social exploration mechanisms on robot learning. In *Ro-man 2009—the 18th IEEE international symposium on robot and human interactive communication* (pp. 128–134). IEEE.

Symposia

- 1 DePalma, N. & Hodgins, J. (2020). Leveraging knowledge asymmetries to evaluate synthesized gesture based communication in human-robot interaction. Workshop in AI & Its Alternatives in Assistive & Collaborative Robotics: Decoding Intent at Robotics: Science and Systems.
- 2 DePalma, N. (2019). Modeling who speaks next for less structured multi-party interactions." Samsung Technical Report.
- 3 Hart, J. W., Freedman, R. G., DePalma, N., Iocchi, L., Leonetti, M., Senft, E., ... Mead, R. (2019). Artificial intelligence for human-robot interaction (ai-hri): service robots in human environments. The proceedings of the AAAI Fall Symposium Series: Service Robots in Human Environments.

- 4 Bullard, K., DePalma, N., Freedman, R. G., Hayes, B., Iocchi, L., Lohan, K., ... Williams, T. (2018). Proceedings of the ai-hri symposium at aaai-fss 2018. Proceedings the Fall Symposium of the Association for Artificial Intelligence. Annual Symposium on Interactive Learning in Artificial Intelligence for Human-Robot Interaction.
- 5 Rakova, B. & DePalma, N. (2018). Minority report detection in refugee-authored community-driven journalism using rbms. Proceedings of the Neural Information Processing Systems (NeurIPS). Workshop on AI for Social Good.
- 6 DePalma, N. & Breazeal, C. (2016a). Nimbus: a hybrid cloud-crowd realtime architecture for visual learning in interactive domains. Proceedings of ACM/IEEE International Conference on Human-Robot Interaction. Annual Workshop on Cognitive Architectures for Human-Robot Interaction.
- 7 DePalma, N. & Breazeal, C. (2015). A sensorimotor account of attention sharing in hri: survey and metric. Proceedings the Fall Symposium of the Association for Artificial Intelligence. Annual Symposium on Artificial Intelligence and Human-Robot Interaction.
- 8 DePalma, N. (2014). "quis custodiet ipsos custodes?", artificial intelligence and the interactionist stance. Proceedings the Fall Symposium of the Association for Artificial Intelligence. Annual Symposium on Artificial Intelligence and Human-Robot Interaction.
- 9 Jung, M., DePalma, N., Chernova, S., Hinds, P., & Breazeal, C. (2012). Human-robot collaboration: bids and bytes. Proceedings of ACM/IEEE International Conference on Human-Robot Interaction. Annual Workshop on Human-Agent-Robot Teamwork.
- 10 DePalma, N., Chernova, S., & Breazeal, C. (2011). Leveraging online virtual agents to crowdsource human-robot interaction. Proceedings of International Conference on Computer Human Interaction (CHI). Workshop on Crowdsourcing and Human Computation.

Exhibitions

- 2014
 - Sensible Cities Group. Local Warming, GLOW Festival. Eindhoven, NL. November
 - Sensible Cities Group. Local Warming, Architecture Biennale, Venice, Italy. June-October [[Link](#)]
- 2010
 - Andrea Thomaz, Maya Cakmak, Michael Gielniak, Nick dePalma. Interactive Learning with the Simon Robot. *CHI Interactive Exhibition*. April 2010, Atlanta, GA.
- 2006
 - Matt Flagg, Nick dePalma, Jeremy Barrett, Clint Higley. SxSW Interactive Red Bull VIP House. *South by Southwest* March 2006, Austin, TX.
 - Matt Flagg, Nick dePalma, Jeremy Barrett, Patrick Burns. Computer vision based games in daylight *AT&T Release Party* February 2006, NYC Times Square, Military Island.
- 2005 – 2006
 - Greg Roberts, Matt Flagg, Ben Buchwald, Nick dePalma, Jeremy Barrett, Patrick Burns, Clint Higley. AT&T Interactive Cell Phone Based Games on Reuter's Display. New Years Eve, NYC Times Square.
- 2005
 - Greg Roberts, Matt Flagg, Nick dePalma, Jeremy Barrett, Ben Buchwald, Patrick Burns. Computer Vision Based Games Exhibit. *Wired Nextfest* July 2005, New York, NY.
- 2004
 - Greg Roberts, Matt Flagg, Nick dePalma, Jeremy Barrett, Ben Buchwald. Computer Vision Based Games Exhibit. *Wired Nextfest* July 2004, Chicago IL.

Skills

- Software frameworks 📌 Python, C, C++, Java, Clojure, PyTorch, Matlab, Javascript, JQuery, Haskell, OpenGL.
- Prototyping 📌 Digital and basic analog electronics, CAD design, 3D printing, lasercutting, and milling.

Service and Affiliations

- 2021 📌 Organizing Committee. Exploring Applications for Autonomous Non-Verbal Human-Robot Interactions. International HRI Conference. Boulder, CO.
- 2020 📌 Editor. International Journal of Community Well-Being. Special Issue on AI.
- 2019 📌 Organizing Committee. AI-HRI for Service Robots in Human Environments. AAAI Fall Symposium Series. Washington, DC.
- 📌 Member. Fine Art Miracles Inc. Pittsburgh, PA.
- 2018 📌 Organizing Committee. Interactive Learning in Artificial Intelligence for Human-Robot Interaction. AAAI Fall Symposium Series. Washington, DC.
- 📌 Program Committee. Face and Gesture Conference. Xi'an China.
- 📌 Judge. alt.HRI Committee. Human Robot Interaction Conference. Chicago, IL.
- 2016 📌 Finance Chair. Artificial Intelligence in Human Robot Interaction. AAAI Fall Symposium Series. Washington, DC.
- 2015 📌 Program Subcommittee Member (Enabling Knowledge). Human-Robot Interaction Conference (HRI). Portland, OR.
- 📌 Student Leader, Research@ML (Media Lab). Coordinator and chair person.
- 2014 – 2016 📌 Socially Assistive Robotics MIT Team Member. Cross-Institute project involving Yale, Univ. Southern California, Cornell, Stanford, MIT.
- 2013 📌 Program Committee. Interactive Machine Learning Workshop, Interactive User Interface (IUI). Santa Monica, CA. [[Link](#)]
- 2011 📌 Lead for Applied Machine Learning reading group at the MIT Media Lab.
- 2005 📌 National Nanotechnology Infrastructure Network (NNIN) education - advocate for college level and high school student representation
- 2004 – 2005 📌 Georgia Tech, GT-ACM leadership
- 2002 – 2005 📌 National Society of Collegiate Scholars (NSCS)
- 2001 – 2005 📌 Golden Key
- 1996 📌 Dimension Web design : Pro bono work. Designed website for band Squirrel Nut Zippers among other small clients.

References

Available on Request