Sean Andrist

Microsoft Research

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Research Interests

Physically/socially situated interaction
Human-robot interaction
Embodied conversational agents
Computational context analysis

Employment

2016 – present **Senior Researcher**, *Microsoft Research*, Redmond, WA.
Member of the Adaptive Systems and Interaction group.
Conducting research on social robots and other situated interactive systems deployed "in-the-wild."
Developing the open-source "Platform for Situated Intelligence" with a team of software engineers.

2010 – 2016 **Graduate Researcher**, *UW–Madison Department of Computer Sciences*, Madison, WI.
Conducted research as part of the Human-Computer Interaction and Visual Computing laboratories.
Dissertation centered on effective social gaze behaviors for human-robot and human-agent interaction.

Summer 2015 **Research Intern**, *Microsoft Research*, Redmond, WA.
Investigated methods by which social robots can distinguish users' intentions and shape interactions.

Spring 2014 **Graduate Research Fellow**, *ENSTA ParisTech*, Palaiseau, France.
Recipient of the Chateaubriand Research Fellowship offered by the Embassy of France in the United States, funding five months of research in France on socially assistive robots.

Fall 2012 **Research & Development Lab Associate**, *Disney Research Pittsburgh*, Pittsburgh, PA.
Researched multiparty turn-taking with groups of children interacting with an embodied conversational agent capable of using subtle verbal and nonverbal social cues.

2008 – 2010 **Undergraduate Research Assistant**, *University of Minnesota / Medtronic*, Minneapolis, MN.
Developed novel real time volumetric visualizations of cardiac activity for physicians to view and manipulate during surgery while mapping a patient's heart with cardiac lead implantation.

2009 – 2010 **Researcher**, *MinERS (Minnesota Emergency Response Squad)*, Minneapolis, MN.
Developed artificial intelligence strategies for agents in the RoboCup Rescue Agent Simulation.

Education

2010 – 2016 **PhD in Computer Science**, *University of Wisconsin–Madison*.
Department of Computer Sciences
Dissertation title: Gaze Mechanisms for Situated Interaction with Embodied Agents
Committee: Bilge Mutlu (co-chair), Michael Gleicher (co-chair), Kevin Ponto, David Shaffer, Adriana Tapus

2010 – 2012 **Masters of Science in Computer Science**, *University of Wisconsin–Madison*.
Department of Computer Sciences

2006 – 2010 **Bachelors of Science in Computer Science**, *University of Minnesota–Twin Cities*.
Summa Cum Laude
High Distinction
Minor in Mathematics

Teaching Experience

Spring 2015 **Instructor (Introduction to Human-Computer Interaction)**, *UW–Madison*.
Lectured 63 students on basic HCI principles, methods, and applications.
Mentored student teams on designing and executing class projects.
Teaching evaluation: 4.52/5.00

Fall 2013 **After School CS Club Leader**, *Thoreau Elementary School*, Madison, WI.
Service learning project teaching computer science concepts to 4th–5th grade students with Scratch.

2008 – 2009 **Honors Tutor**, *University of Minnesota Honors Program*, Minneapolis, MN.
Worked one-on-one with students to provide assistance in math, physics, and computer science.

2008 – 2009 **Orientation Counselor**, *University of Minnesota Honors Program*, Minneapolis, MN.
Advised incoming freshmen, helping them to schedule classes and start thinking about research.

Publications

Doctoral Dissertation

2016 *Gaze Mechanisms for Situated Interaction with Embodied Agents*.
University of Wisconsin-Madison, WI, USA.

Journal Articles

2019 Aly, A., Pathak, S., **Andrist, S.**, Tacchella, A.
Social cognitive systems in smart environments: Approaches for learning, reasoning, and adaptation (Editorial Introduction).
Cognitive Systems Research. 58. 230–233

2018 **Andrist, S.**, Ruis, A. R., Shaffer, D. W.
A network analytic approach to gaze coordination during a collaborative task.
Computers in Human Behavior. 89. 339–348.

2016 **Andrist, S.**, Bohus, D., Mutlu, B., Schlangen, D.
Turn-Taking and Coordination in Human-Machine Interaction (Introduction).
AI Magazine. 37:4. 5–6.

2015 **Andrist, S.**, Collier, W., Gleicher, M., Mutlu, B., Shaffer, D.
Look Together: Analyzing Gaze Coordination with Epistemic Network Analysis.
Frontiers in Psychology. 6:1016. 1–15.

2015 Huang, C.-M., **Andrist, S.**, Sauppé, A., Mutlu, B.
Using Gaze Patterns to Predict Task Intent in Collaboration.
Frontiers in Psychology. 6:1049. 1–12.

2015 Pejsa, T., **Andrist, S.**, Mutlu, B., Gleicher, M.
Gaze and Attention Management for Embodied Conversational Agents.
ACM Transactions on Interactive and Intelligent Systems (TiiS). 5(1), Article 3. 34 pages.

2015 Ruhland, K., Peters, C. E., **Andrist, S.**, Badler, J. B., Badler, N. I., Gleicher, M., Mutlu, B. McDonnell, R.
A Review of Eye Gaze in Virtual Agents, Social Robotics and HCI: Behaviour Generation, User Interaction and Perception.
Computer Graphics Forum.

Book Chapters

2014 Mutlu, B., **Andrist, S.**, Sauppé, A.
Enabling Human-Robot Dialogue.
In J. Markowitz (Ed.) *Robots that Talk and Listen*. De Gruyter.

Refereed Full Conference Papers

2020 Hedayati, H., Muehlbradt, A., Szafir, D. J., **Andrist, S.**
REFORM: Recognizing F-formations for Social Robots.
In *Proceedings of the 2020 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2020)*. Las Vegas, Nevada, USA.

2020 Modi, A., Dey, D., Agarwal, A., Swaminathan, A., Nushi, B., **Andrist, S.**, Horvitz, E.
Metareasoning in Modular Software Systems: On-the-Fly Configuration using Reinforcement Learning with Rich Contextual Representations.
In *Proceedings of the Thirty-Fourth AAAI Conference on Artificial Intelligence (AAAI-20)*. 5207–5215.

2019 Zolyomi, A., Begel, A., Waldern, J. F., Tang, J., Barnett, M., Cutrell, E., McDuff, D., **Andrist, S.**, Morris, M. R.
Managing Stress: The Needs of Autistic Adults in Video Calling.
In *Proceedings of the 22nd ACM Conference on Computer-Supported Cooperative Work and Social Computing (CSCW '19)*.
[**Best Paper Honorable Mention**]

2017 **Andrist, S.**, Bohus D., Kamar E., Horvitz E.
What Went Wrong and Why? Diagnosing Situated Interaction Failures in the Wild.
In: Kheddar A. et al. (eds), *Proceedings of the International Conference on Social Robotics (ICSR '17)*. Springer. 293–303.

2017 **Andrist, S.**, Gleicher, M., Mutlu, B.
Looking Coordinated: Bidirectional Gaze Mechanisms for Collaborative Interaction with Virtual Characters.
In *Proceedings of the 2017 CHI Conference on Human Factors in Computing Systems (CHI '17)*. ACM. New York, NY, USA. 2571–2582.
[Best of CHI Honorable Mention Award]

2015 **Andrist, S.**, Mutlu, B., Tapus, A.
Look Like Me: Matching Robot Personality via Gaze to Increase Motivation.
In *Proceedings of the 33rd Annual ACM Conference on Human Factors in Computing Systems (CHI '15)*. ACM. New York, NY, USA. 3603–3612.
[**Best of CHI Honorable Mention Award**]

2015 **Andrist, S.**, Ziadee, M., Boukaram, H., Mutlu, B., Sakr, M.
Effects of Culture on the Credibility of Robot Speech: A Comparison between English and Arabic.
In *Proceedings of the Tenth Annual ACM/IEEE International Conference on Human-Robot Interaction (HRI '15)*. ACM. New York, NY, USA. 157–164.

2014 **Andrist, S.**, Tan, X. Z., Gleicher, M., Mutlu, B.
Conversational Gaze Aversion for Humanlike Robots.
In *Proceedings of the 2014 ACM/IEEE International Conference on Human-Robot Interaction (HRI '14)*. ACM. New York, NY, USA. 25–32.
[**Best Paper Award Nominee**]

2014 Ruhland, K., **Andrist, S.**, Badler, J. B., Peters, C. E., Badler, N. I., Gleicher, M., Mutlu, B., McDonnell, R.
"Look Me in the Eyes": A Survey of Eye and Gaze Animation for Virtual Agents and Artificial Systems.
In *Eurographics 2014 - State of the Art Reports (EG '14 STARs)*.

2013 **Andrist, S.**, Mutlu, B., Gleicher, M.
Conversational Gaze Aversion for Virtual Agents.
In R. Aylett, B. Krenn, C. Pelachaud, & H. Shimodaira (Eds.), *Proceedings of the 13th International Conference on Intelligent Virtual Agents (IVA '13)*. Springer Berlin Heidelberg. 249–262.
[**Highly Commended Paper**]

2013 **Andrist, S.**, Spannan, E., Mutlu, B.
Rhetorical Robots: Making Robots More Effective Speakers Using Linguistic Cues of Expertise.
In *Proceedings of the 8th ACM/IEEE International Conference on Human-Robot Interaction (HRI '13)*. IEEE Press. Piscataway, NJ, USA. 341–348.

2013 Leite, I., Hajishirzi, H., **Andrist, S.**, Lehman, J.
Managing Chaos: Models of Turn-taking in Character-multichild Interactions.
In *Proceedings of the 15th International Conference on Multimodal Interaction (ICMI '13)*. ACM. New York, NY, USA. 43–50.

2012 **Andrist, S.**, Pejsa, T., Mutlu, B., Gleicher, M.
Designing Effective Gaze Mechanisms for Virtual Agents.
In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (CHI '12)*. ACM. New York, NY, USA. 705–714.

2010 Nanjanath, M., Erlandson, A., **Andrist, S.**, Ragipindi, A., Mohammed, A., Sharma, A., Gini, M.
Decision and Coordination Strategies for RoboCup Rescue Agents.
In *Proceedings of the Second International Conference on Simulation, Modeling, and Programming for Autonomous Robots (SIMPAR '10)*. 473–484.

Refereed Workshop, Demonstration, and Short Conference Papers

2020 **Andrist, S.**, Bohus, D.
Accelerating the Development of Multimodal, Integrative-AI Systems with Platform for Situated Intelligence.
In *Proceedings of the 2020 AAAI Fall Symposium on Artificial Intelligence for Human-Robot Interaction: Trust & Explainability in Artificial Intelligence for Human-Robot Interaction.*

2020 Tan, X. Z., **Andrist, S.**, Bohus, D., Horvitz, E.
Now, Over Here: Leveraging Extended Attentional Capabilities in Human-Robot Interaction.
In *Companion of the 2020 ACM/IEEE International Conference on Human-Robot Interaction (HRI '20 Late-breaking Reports)*. ACM. New York, NY, USA. 468—470.

2020 Begel, A., Tang, J., **Andrist, S.**, Barnett, M., Carbary, T., Choudhury, P., Cutrell, E., Fung, A., Junuzovic, S., McDuff, D., Rowan, K., Sahoo, S., Waldern, J. F., Wolk, J., Zheng, H., Zolyomi, A.
Lessons Learned in Designing AI for Autistic Adults.
In *Proceedings of the 22nd International ACM SIGACCESS Conference on Computers and Accessibility (ASSETS '20)*. ACM. New York, NY, USA. Article 46, 1–6.

2019 **Andrist, S.**, Bohus, D., Feniello, A.
Demonstrating a Framework for Rapid Development of Physically Situated Interactive Systems.
In *Proceedings of the 2019 ACM/IEEE International Conference on Human-Robot Interaction (HRI '19)*. ACM. 668.

2017 Bohus, D., **Andrist, S.**, Horvitz, E.
A study in scene shaping: Adjusting F-formations in the wild.
In *Proceedings of the 2017 AAAI Fall Symposium: Natural Communication for Human-Robot Collaboration.*

2017 Bohus, D., **Andrist, S.**, Jalobeanu, M.
Rapid Development of Multimodal Interactive Systems: A Demonstration of Platform for Situated Intelligence.
In *Proceedings of the 19th ACM International Conference on Multimodal Interaction (ICMI '17)*. ACM. 493–494.
[**Best Demo Award**]

2017 Bellamy, R. K. E., **Andrist, S.**, Bickmore, T., Churchill, E. F., Erickson, T.
Human-Agent Collaboration: Can an Agent be a Partner?
In *Proceedings of the 2017 CHI Conference Extended Abstracts on Human Factors in Computing Systems (CHI EA '17)*. ACM. New York, NY, USA. 1289-1294.

2016 **Andrist, S.**, Bohus, D., Yu, Z., Horvitz, E.
Are You Messing with Me? Querying about the Sincerity of Interactions in the Open World.
In *Companion of the 2016 ACM/IEEE International Conference on Human-Robot Interaction (HRI '16 Late-breaking Reports)*. ACM. New York, NY, USA.

2013 **Andrist, S.**, Leite, I., Lehman, J.
Fun and Fair: Influencing Turn-taking in a Multi-party Game with a Virtual Agent.
In *Proceedings of the 12th International Conference on Interaction Design and Children (IDC '13)*. ACM. New York, NY, USA. 352–355.

2013 **Andrist, S.**
Controllable Models of Gaze Behavior for Virtual Agents and Humanlike Robots.
In *Proceedings of the 15th ACM International Conference on Multimodal Interaction (ICMI '13), Doctoral Consortium*. ACM. New York, NY, USA. 333–336.

2013 Leite, I., Hajishirzi, H., **Andrist, S.**, Lehman, J.
Take or Wait? Learning Turn-Taking from Multiparty Data.
In *AAAI Conference on Artificial Intelligence (Late-Breaking Developments)*.

2012 **Andrist, S.**, Pejsa, T., Mutlu, B., Gleicher, M.
A Head-Eye Coordination Model for Animating Gaze Shifts of Virtual Characters.
In *Proceedings of the 14th International Conference on Multimodal Interaction (ICMI '12), 4th Workshop on Eye Gaze in Intelligent Human Machine Interaction (Gaze-In '12)*. ACM. New York, NY, USA.

Patents

2019 Ryen White, Andy Wilson, Gregg Wygonik, Nirupama Chandrasekaran, **Sean Andrist**.
Non-Verbal Engagement of a Virtual Assistant. (Microsoft).
Publication #US20190187787. Filing date: 2017–12–20. Publication date: 2019–06–20.

Honors

2019 CSCW Best Paper Honorable Mention

2017 ICMI Best Demo Award

2017 Best of CHI Honorable Mention Award

2016 Graduate Student Research Award from UW Madison Department of Computer Sciences

2015 First Place Winner (out of 23) in the UW Graduate School's *Three Minute Thesis* Competition

2015 Best of CHI Honorable Mention Award

2014 HRI Best Paper Award Nominee

2014 Chateaubriand Research Fellowship

2013 IVA Highly Commended Paper Award

2013 Travel scholarship to IVA conference in Edinburgh, UK: 2013

2012 National Science Foundation (NSF) Graduate Research Fellowship (Honorable Mention)

2010-2011 Grace Wahba Fellowship

2006-2007 ShopKo and Lando Scholarships

Advising and Supervising

Interns (Microsoft)

2019 *Xiang Zhi Tan* (Carnegie Mellon University) – Leveraging extended attentional capabilities in open-world human-robot interaction.

2018 *Hooman Hedayati* (University of Colorado Boulder) – Exploring data-driven approaches to recognizing F-formations in the open world.

2018 *Dimosthenis Kontogiorgos* (KTH Royal Institute of Technology) – Inferring interaction success and quality from observed user reactions to situated social robot behaviors.
Co-mentored with Dan Bohus.

2017 *Siddhartha Banerjee* (Georgia Tech) – Interaction, engagement, and activity recognition for mobile robot platforms.
Co-mentored with Dan Bohus.

PhD Thesis Committee

2021 *Siddhartha Banerjee* (Georgia Tech)

Professional Activities and Service

Invited Talks and Panels

2020 **Invited Panelist**, *ICMI Doctoral Consortium*, Utrecht, The Netherlands.

2020 **Invited Speaker**, *Graduate Course on "Building Interactive Machines*, Yale.
Talk title: "Situated Interaction with Socially Intelligent Systems: New Challenges and Tools"

2019 **Invited Panelist**, *CSAIL-MSR Trustworthy and Robust AI (TRAC) Workshop*, MIT.
Topic: Human-AI Interaction
Co-panelists: Arvind Satyanarayan (MIT), Antonio Torralba (MIT)

2019 **Invited Discussion Panel Chair**, *ICSR Workshop*, Madrid, Spain,
The Communication Challenges in Joint Action for Human-Robot Interaction.
Topic: "What Happens When Things Go Wrong?"

2019 **Invited Panelist**, *SIGDIAL Young Researchers Roundtable*, Stockholm, Sweden.
Topic: Academia and Industry Experiences
Co-panelists: Pierre Lison (Norwegian Computing Center), Catharine Oertel (TU Delft), Gabriel Skantze (KTH)

2019 **Invited Speaker**, *ANIMATAS program*, KTH,
Summer School on Virtual Characters & Computer Game Technologies.
Talk title: "Agents, Robots and Situated Intelligence"

2019 **Invited Speaker**, *RoboGrads Seminar*, UC San Diego.
Talk title: "Situated Interaction"

2018 **Invited Speaker**, *HCII Seminar Series*, CMU.
Talk title: "Situated Interaction in the Open World: New Systems and Challenges"

2018 **Invited Speaker**, *AI Seminar Series*, University of Washington.
Talk title: "Situated Interaction in the Open World: New Systems and Challenges"

2018 **Contributed Presentation**, *UW CSE MSR Summer Institute*,
Social Robotics: Challenges, Opportunities, and New Directions.
Talk title: "Just Let the Robot Do Its Job! Situated Interaction Challenges in the Open World"

2017 **Invited Panelist**, *CHI*, Denver, CO.
Topic: "Human-Agent Collaboration: Can an Agent be a Partner?"
Co-panelists: Rachel K. E. Bellamy (IBM Research), Timothy Bickmore (Northeastern University), Elizabeth F. Churchill (Google), Thomas Erickson (IBM Research)

2017 **Invited Speaker**, *Human Factors and Applied Cognition Brown Bag Lecture*, GMU.
Talk title: "Gaze Mechanisms for Situated Interaction with Embodied Agents"

2016 **Invited Speaker**, *UW CSE Robotics Colloquium*, University of Washington.
Talk title: "Gaze Mechanisms for Situated Interaction with Embodied Agents"

2016 **Invited Poster**, *Computing Community Consortium (CCC)*, Washington, D.C,
Computing Research: Addressing National Priorities and Societal Needs.
Poster title: "Situated Gaze Mechanisms for Embodied Agents"

2014 **Invited Participant**, *HRI Pioneers Workshop*, Bielefeld, Germany.
Talk title: "Coordinative Gaze Mechanisms for Social Robots"

2013 **Invited Participant**, *ICMI Doctoral Consortium*, Sydney, Australia.
Talk title: "Controllable Models of Gaze Behavior for Virtual Agents and Humanlike Robots"

Organization and Leadership

2020 **Workshop Organizer**, AI Breakthroughs, Microsoft Research.
Co-organizers: Daniel McDuff (MSR), Sara Smith (MSR).

2020 **Conference Organizer**, *Track Chair*, HRI, Cambridge, UK.
alt.HRI Track at the ACM/IEEE International Conference on Human-Robot Interaction (HRI).

2018 **Institute Organizer**, UW CSE MSR Summer Institute.
Topic: *Social Robotics: Challenges, Opportunities, and New Directions*.
Cosponsored by the Paul G. Allen School of Computer Science & Engineering at the University of Washington and Microsoft Research.
Co-organizers: Dan Bohus (MSR), Maya Cakmak (University of Washington), Siddhartha Srinivasa (University of Washington).

2018 **Special Session Organizer**, SIGDIAL, Melbourne, Australia.
Topic: *Physically Situated Dialogue (RoboDIAL)*.
At the Annual Conference of the Joint ACL/ISCA Special Interest Group on Discourse and Dialogue.
Co-organizers: Stephanie Lukin (Army Research Lab), Matthew Marge (Army Research Lab), Jesse Thomason (University of Texas at Austin), Zhou Yu (University of California, Davis).

2017 **Session Organizer and Chair**, Faculty Summit, Microsoft Research.
Topic: *Integrative-AI*.
Co-organizers: Dan Bohus (MSR), Ece Kamar (MSR), Eric Horvitz (MSR).

2015 **Symposium Organizer**, AAAI Spring Symposium, Stanford, CA.
Topic: *Turn-taking and Coordination in Human-Machine Interaction*
Co-organizers: Dan Bohus (MSR), Eric Horvitz (MSR), Bilge Mutlu (University of Wisconsin–Madison), David Schlangen (Bielefeld University).

Editorial Service

2018 – Present **Review Editor**, *Frontiers in Robotics and AI*.
Topic: Human-Robot Interaction

2019 **Guest Editor**, *Cognitive Systems Research*.
"Social Cognitive Systems in Smart Environments: Approaches for Learning, Reasoning, and Adaptation"
Co-editors: Amir Aly, Shashank Pathak, Armando Tacchella

2016 **Special Issue Editor**, *AI Magazine*.
"Turn-taking and Coordination in Human-Machine Interaction".
Co-editors: Dan Bohus (MSR), Bilge Mutlu (University of Wisconsin–Madison), David Schlangen (Bielefeld University).

Program Committee

2019, 2020 International Conference on Multimodal Interaction (ICMI)

2017, 2020 International Conference on Intelligent Virtual Agents (IVA)

2018, 2019 ACM/IEEE International Conference on Human-Robot Interaction (HRI)

Referee for Conference Proceedings

ACM/IEEE Human-Robot Interaction Conference (HRI)
ACM/SigCHI Conference on Human Factors in Computing (CHI)
ACM Conference on Computer-Supported Collaborative Work and Social Computing (CSCW)
ACM International Conference on Multimodal Interaction (ICMI)
IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)
IEEE International Symposium on Robot and Human Interactive Communication (RO-MAN)
International Conference on Social Robotics (ICSR)
International Conference on Intelligent Virtual Agents (IVA)

Referee for Journal Articles

ACM Transactions on Human-Robot Interaction (THRI)
ACM Transactions on Interactive Intelligent Systems (TiiS)
Artificial Intelligence Review
Computers in Human Behavior
Frontiers in Robotics and AI
IEEE Robotics and Automation Letters (RA-L)
IEEE Robotics and Automation Magazine (RAM)
International Journal of Robotics Research (IJRR)
International Journal of Social Robotics (IJSR)
Nature Scientific Reports

Selected Press and Blog Articles

Microsoft Research Blog, 2020: PSI: An open-source framework for multimodal, integrative AI
Microsoft Research Blog, 2020: AI for AI: Metareasoning for modular computing systems
Microsoft Research Blog, 2018: PSI: Tools and Framework for Multimodal Interaction Research
Wired (UK), 2016: This robot changes how it looks depending on your personality
IEEE Spectrum (US), 2016: This robot changes how it looks at you to match your personality
Popular Science (US), 2014: Robots seem more thoughtful if they glance away while they talk
New Scientist (UK), 2014: The robot tricks to bridge the uncanny valley
IEEE Spectrum (US), 2014: What robot behavior makes people feel uncomfortable?
Science Nation (US), 2012: Robots that can teach humans

Professional References

Eric Horvitz
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Microsoft Research
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