NIKOLAS MARTELARO

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I explore the future of design. My research focuses on creating interaction systems and design tools with the goal of helping designers better understand people and create human-centered products. I blend a background in mechanical engineering, mechatronics, computing, data collection, and product design to develop new interactive systems and to understand how designers do design. My work looks at observing people using intelligent systems and designing new kinds of interactive devices. My research has implications for human-robot interaction, autonomous cars, and human-centered artificial intelligence. My teaching aims to provide designers the skills to use new technologies and develop systems that focus on the needs of people.

EDUCATION

2012–2018 **Stanford University** | Stanford, CA
Ph.D. in Mechanical Engineering
DISSERTATION: *The Needfinding Machine*
COMMITTEE: Larry Leifer, Wendy Ju, Pamela Hinds, James Landay

2012–2014 **Stanford University** | Stanford, CA
M.S. in Mechanical Engineering

2008–2012 **Franklin W. Olin College of Engineering** | Needham, MA
B.S. Engineering: Design

EMPLOYMENT

2020– **Assistant Professor**
Human-Computer Interaction Institute
Carnegie Mellon University

2018–2019 **Technology Research & Development Associate Principal**
Accenture Technology Labs

2017 **Research Intern**
Microsoft Research
ADVISOR: Shamsi Iqbal

PUBLICATIONS

Journal Articles

Tong Wu, **Nikolas Martelaro**, Simon Stent, Jorge Ortiz, Wendy Ju. "Learning When Agents Can Talk to Drivers Using the INAGT Dataset and Multisensor Fusion". In: *Proc. ACM Interact. Mob. Wearable Ubiquitous Technol.* 5.3 (Sept. 2021).

Ozgur Eris, **Nikolas Martelaro**, Petra Badke-Schaub. "A comparative analysis of multimodal communication during design sketching in co-located and distributed environments". In: *Design Studies* 35.6 (2014), pp. 559–592.

Chapters

Nikolas Martelaro, Wendy Ju. "The needfinding machine". In: *Social internet of things*. Springer, Cham, 2019, pp. 51–84.

Nikolas Martelaro, Wendy Ju, Mark Horowitz. "The Interaction Engine". In: *Design Thinking Research*. Springer, Cham, 2018, pp. 147–169.

David Sirkin, Sonia Baltodano, Brian Mok, Dirk Rothenbücher, Nikhil Gowda, Jamy Li, **Nikolas Martelaro**, David Miller, Srinath Sibi, Wendy Ju. "Embodied design improvisation for autonomous vehicles". In: *Design thinking research*. Springer, Cham, 2016, pp. 125–143.

Nikolas Martelaro, Shameek Ganguly, Martin Steinert, Malte Jung. "The personal trait myth: a comparative analysis of the innovation impact of design thinking tools and personal traits". In: *Design Thinking Research*. Springer, Cham, 2015, pp. 41–57.

Conference Papers (Refereed)

David Chuan-En Lin, **Nikolas Martelaro**. "Learning Personal Style from Few Examples". In: *Designing Interactive Systems Conference 2021*. DIS '21. Virtual Event, USA: Association for Computing Machinery, 2021, pp. 1566–1578. ISBN: 9781450384766.

Nikolas Martelaro, Tarannum Lakdawala, Jingya Chen, Jessica Hammer. "Leveraging the Twitch Platform and Gamification to Generate Home Audio Datasets". In: *Designing Interactive Systems Conference 2021*. DIS '21. Virtual Event, USA: Association for Computing Machinery, 2021, pp. 1765–1782. ISBN: 9781450384766.

J.D. Zamfirescu-Pereira, David Sirkin, David Goedicke, Ray LC, Natalie Friedman, Ilan Mandel, **Nikolas Martelaro**, Wendy Ju. "Fake It to Make It: Exploratory Prototyping in HRI". In: *Companion of the 2021 ACM/IEEE International Conference on Human-Robot Interaction*. HRI '21 Companion. Boulder, CO, USA: Association for Computing Machinery, 2021, pp. 19–28. ISBN: 9781450382908.

Nikolas Martelaro, Sarah Mennicken, Jennifer Thom, Henriette Cramer, Wendy Ju. "Using Remote Controlled Speech Agents to Explore Music Experience in Context". In: *Proceedings of the 2020 ACM Designing Interactive Systems Conference*. 2020, pp. 2065–2076.

Nikolas Martelaro, Jaime Teevan, Shamsi T Iqbal. "An Exploration of Speech-Based Productivity Support in the Car". In: *Proceedings of the 2019 CHI Conference on Human Factors in Computing Systems*. 2019, pp. 1–12.

Rob Semmens, **Nikolas Martelaro**, Pushyami Kaveti, Simon Stent, Wendy Ju. "Is now a good time? an empirical study of vehicle-driver communication timing". In: *Proceedings of the 2019 CHI Conference on Human Factors in Computing Systems*. 2019, pp. 1–12.

Nikolas Martelaro, Wendy Ju. "WoZ Way: Enabling real-time remote interaction prototyping & observation in on-road vehicles". In: *Proceedings of the 2017 ACM Conference on Computer Supported Cooperative Work and Social Computing*. 2017, pp. 169–182.

Dylan Moore, **Nikolas Martelaro**, Wendy Ju, Hamish Tennent. "Making noise intentional: A study of servo sound perception". In: *2017 12th ACM/IEEE International Conference on Human-Robot Interaction (HRI*. IEEE. 2017, pp. 12–21.

David Sirkin, **Nikolas Martelaro**, Mishel Johns, Wendy Ju. "Toward measurement of situation awareness in autonomous vehicles". In: *Proceedings of the 2017 CHI Conference on Human Factors in Computing Systems*. 2017, pp. 405–415.

Nikolas Martelaro, Victoria C Nneji, Wendy Ju, Pamela Hinds. "Designing HRI to Encourage More Trust, Disclosure, and Companionship, The Eleventh ACM". In: *IEEE International Conference on Human Robot Interaction*. 2016.

Nikolas Martelaro, Victoria C Nneji, Wendy Ju, Pamela Hinds. "Tell Me More: Designing HRI to encourage more trust, disclosure, and companionship". In: *HRI '16*. 2016.

Marco Spadafora, Victor Chahuneau, **Nikolas Martelaro**, David Sirkin, Wendy Ju. "Designing the behavior of interactive objects". In: *Proceedings of the TEI'16: Tenth*

International Conference on Tangible, Embedded, and Embodied Interaction. ACM. 2016, pp. 70–77.

Sonia Baltodano, Srinath Sibi, **Nikolas Martelaro**, Nikhil Gowda, Wendy Ju. "The RRADS platform: a real road autonomous driving simulator". In: *Proceedings of the 7th International Conference on Automotive User Interfaces and Interactive Vehicular Applications*. 2015, pp. 281–288.

Malte F Jung, **Nikolas Martelaro**, Pamela J Hinds. "Using robots to moderate team conflict: the case of repairing violations". In: *Proceedings of the Tenth Annual ACM/IEEE International Conference on Human-Robot Interaction*. 2015, pp. 229–236.

Nikolas Martelaro, Malte Jung, Pamela Hinds. "Using robots to moderate team conflict: The case of repairing violations". In: *Proceedings of the Tenth Annual ACM/IEEE International Conference on Human-Robot Interaction Extended Abstracts*. 2015, pp. 271–271.

Malte F Jung, **Nikolas Martelaro**, Halsey Hoster, Clifford Nass. "Participatory materials: having a reflective conversation with an artifact in the making". In: *Proceedings of the 2014 conference on Designing Interactive Systems*. 2014, pp. 25–34.

Ozgur Eris, **Nikolas Martelaro**. "A Comparative Analysis of Sketching Interactions of Designers in Co-located and Distributed Environments". In: *Design Thinking Research Symposium - DTRS8*. DTRS8. 2010, pp. 149–162.

Invited Articles

Nikolas Martelaro, Wendy Ju. "Cybernetics and the design of the user experience of AI systems". In: *interactions* 25.6 (2018), pp. 38–41.

Workshops Papers (Refereed)

David Chuan-En Lin, Anastasis Germanidis, Cristóbal Valenzuela, Yining Shi, **Nikolas Martelaro**. "Soundify: Matching Sound Effects to Video". In: *5th NeurIPS Workshop on Machine Learning for Creativity and Design*. 2021.

Wendy Ju, Ilan Mandel, Kevin Weatherwax, Leila Takayama, **Nikolas Martelaro**, Denis Willett. "Remote Observation of Field Work on the Farm". Aug. 2020.

Nikolas Martelaro. "Exploring the Future of Remote User Research". Aug. 2020.

Nikolas Martelaro, Wendy Ju. "DJ Bot: Needfinding Machines for Improved Music Recommendations". In: *2017 AAAI Spring Symposium Series*. 2017.

Nikolas Martelaro. "Wizard-of-oz interfaces as a step towards autonomous HRI". In: *2016 AAAI spring symposium series*. 2016.

Nikolas Martelaro, Michael Shiloh, Wendy Ju. "The interaction engine: Tools for prototyping connected devices". In: *Proceedings of the TEI'16: Tenth International Conference on Tangible, Embedded, and Embodied Interaction*. 2016, pp. 762–765.

Demos, Videos, and Work-In-Progress (Refereed)

Nikolas Martelaro, Wendy Ju. "WoZ Way: Enabling real-time interaction prototyping and on-road observation". In: *Proceedings of the 2017 Conference on Computer Supported Cooperative Work. DOI: http://dx. doi. org/10.1145/2998181.2998293*. 2017.

Nikolas Martelaro, David Sirkin, Wendy Ju. "DAZE: a real-time situation awareness measurement tool for driving". In: *Adjunct Proceedings of the 7th International Conference on Automotive User Interfaces and Interactive Vehicular Applications*. 2015, pp. 158–163.

Organized Workshops

Nikolas Martelaro, Wendy Ju. "What Could Go Wrong? Exploring the Downsides of Autonomous Vehicles". In: *12th International Conference on Automotive User Interfaces and Interactive Vehicular Applications*. 2020, pp. 99–101.

Nikolas Martelaro, Wendy Ju. "A Panel on Cybernetics and the User Experience of AI Systems". In: *2018 AAAI Spring Symposium Series*. 2018.

Naomi T Fitter, Heather Knight, **Nikolas Martelaro**, David Sirkin. "What actors can teach robots". In: *Proceedings of the 2017 CHI Conference Extended Abstracts on Human Factors in Computing Systems*. 2017, pp. 574–580.

David Sirkin, **Nikolas Martelaro**, Hamish Tennent, Mishel Johns, Brian Mok, Wendy Ju, Guy Hoffman, Heather Knight, Bilge Mutlu, Leila Takayama. "Design skills for HRI". In: *2016 11th ACM/IEEE International Conference on Human-Robot Interaction (HRI)*. IEEE. 2016, pp. 581–582.

RESEARCH GRANTS & GIFTS

Federal Grants

2021-2024 **Supporting Designers in Learning to Co-create with AI for Complex Computational Design Tasks**
Funding Body: National Science Foundation - Cyberlearning & Future Learning Technology

Investigators: Nikolas Martelaro (PI), Lining Yao (Co-PI), Kenneth Holstein (Co-PI)
Amount: $850,000

2021-2022 **Equitable new mobility: Community-driven mechanisms for designing and evaluating personal delivery device deployments**
Funding Body: National Science Foundation - Smart & Connected Communities - Planning Grant
Investigators: Sarah Fox (PI), Patrick Carrington (Co-PI), Jodi Forlizzi (Co-PI), Nikolas Martelaro (Co-PI), Corey Harper (Co-PI)
Amount: $150,000

2020–2021 **Inclusive Design Challenge - Stage I**
*Funding Body:*US Department of Transportation
Investigators: Nikolas Martelaro (PI), Patrick Carrington (Co-PI), Sarah Fox (Co-PI), Jodi Forlizzi (Co-PI)
Amount: $300,000

Corporate and Foundation Gifts & Grants

2021–2022 **Accenture Technology Labs**
Investigators: Nikolas Martelaro (PI)
Amount: $100,000

2020–2021 **Accenture Technology Labs**
Investigators: Nikolas Martelaro (PI)
Amount: $100,000

HONORS & AWARDS

2017 **Best Demonstration, CSCW '17.** Portland, OR. *With Wendy Ju*

2013–2018 **Graduate Research Fellowship Program** - National Science Foundation (NSF GRFP). Awarded 2013.

2009 **Miller Research Fellowship**, Franklin W. Olin College of Engineering. Awarded Summer 2009.

INVITED TALKS

SELECTED PRESS COVERAGE

2021 **Pittsburgh Post Gazette**
CMU team to examine autonomous vehicles for people with disabilities
https://www.post-gazette.com/news/transportation/2021/01/11/Carnegie-Mellon-University-federal-Department-of-Transportation-300-000-grant-people-with-disabilities-autonomous-vehicles/stories/202101080091

2021 **US Department of Transportation** (US)
Inclusive Design Challenge Semifinalists
https://www.transportation.gov/inclusive-design-challenge/inclusive-design-challenge-semifinalists

TEACHING

Spring 2022 **Rapid Prototyping of Computer Systems**
05-540/05-872/18-540/18-745/39-648

Fall 2021 **Interaction Design Studio I**
05-651

Spring 2021 **Rapid Prototyping of Computer Systems**
05-540/05-872/18-540/18-745/39-648

Spring 2020 **Rapid Prototyping of Computer Systems**
05-540/05-872/18-540/18-745/39-648

ADVISING

2021– **Frederic Gmeiner** *Co-advised with Kenneth Holstein*
Human-Computer Interaction Institute, Carnegie Mellon University

2020– **David Lin**
Human-Computer Interaction Institute, Carnegie Mellon University

THESIS COMMITTEE MEMBER

2022 **Karan Ahuja**
Dissertation Title: *Practical and High-Fidelity User Digitization On-the-Go*
Human-Computer Interaction Institute, Carnegie Mellon University

2021 **Mary Beth Kery**
Dissertation Title: *Designing Effective History Support for Exploratory Programming Data Work*
Human-Computer Interaction Institute, Carnegie Mellon University

PROFESSIONAL SERVICE

Conference Organizing Committee Roles

2022 **Video Chair**
ACM Conference on Designing Interactive Systems (DIS)

2021 **Video Chair**

ACM Conference on Designing Interactive Systems (DIS)

2021 **Program Committee Member**
ACM Conference on Computer Supported Cooperative Work (CSCW)

2020 **Program Committee Member**
ACM Conference on Human Factors in Computing Systems (CHI)
Understanding People Subcommittee

2019 **Program Committee Member**
ACM Conference on Human Factors in Computing Systems (CHI)
Design Subcommittee

2019 **Program Committee Member**
ACM/IEEE Conference on Human Robot Interaction (HRI)

2018 **Pioneers Workshop Panel Chair**
ACM/IEEE Conference on Human Robot Interaction (HRI)

2016 **Assistant to the Conference Chair**
ACM Conference on Human Factors in Computing Systems (CHI)

2015 **Student Volunteer Chair**
ACM Conference on Tangible, Embedded, & Embodied Interaction (TEI)

2014 **Student Volunteer**
ACM Conference on Tangible, Embedded, & Embodied Interaction (TEI)

Reviewing Service

ACM Conference in Human Factors in Computing (CHI)
ACM Conference on Computer Supported Collaborative Work (CSCW)
ACM Conference in Designing Interactive Systems (DIS)
ACM/IEEE Human-Robot Interaction Conference (HRI)
Frontiers Robotics

University Service

2021 **Ph.D. Admissions Committee**
Human-Computer Interaction Institute, Carnegie Mellon University

2021 **MHCI Admissions Committee**
Human-Computer Interaction Institute, Carnegie Mellon University

2021 **Black Lives Matter Committee**
Human-Computer Interaction Institute, Carnegie Mellon University

2020–2021 **Design Studio Curriculum Task Force**
Human-Computer Interaction Institute, Carnegie Mellon University

2020 **MHCI Admissions Committee**
Human-Computer Interaction Institute, Carnegie Mellon University