NIKOLAS MARTELARO

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My research seeks to augment designers' capabilities so that we can best leverage human capacity and computation to solve society's toughest problems. My research approach integrates cutting-edge technologies, but always with a foundational understanding of designers and how we think and act. This research activity informs my educational mission to teach future designers how to work creatively and critically so they can solve complex, open-ended design challenges. My work spans design domains, blending hardware, software, and interaction design.

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

Zeda Xu, **Nikolas Martelaro**, Christopher McComb. "Mind over modality? The impact of design representation on shared understanding in collaborative student engineering design". In: *Design Science* 11 (2025), e19. DOI: 10.1017/dsj.2025.10008.

Hunter Akridge, Alice Xiaodi Tang, **Nikolas Martelaro**, Sarah E. Fox. "Punctuated and Prolonged: A Workers' Inquiry into Infrastructural Failures in Bus Transit". In: *Proc. ACM Hum.-Comput. Interact.* 9.2 (May 2025). DOI: 10.1145/3710914. URL: https://doi.org/10.1145/3710914.

Natalie Friedman, Alexandra Bremers, Adelaide Nyanyo, Ian Clark, Yasmine Kotturi, Laura Dabbish, Wendy Ju, **Nikolas Martelaro**. "Understanding the Challenges of Maker Entrepreneurship". In: *Proc. ACM Hum.-Comput. Interact.* 9.2 (May 2025). DOI: 10.1145/3711096. URL: https://doi.org/10.1145/3711096.

David Weinberg, Healy Dwyer, Sarah E. Fox, **Nikolas Martelaro**. "Sharing the Sidewalk: Observing Delivery Robot Interactions with Pedestrians during a Pilot in Pittsburgh, PA". In: *Multimodal Technologies and Interaction* 7.5 (2023). ISSN: 2414-4088. DOI: 10.3390/mti7050053.

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, Brad A Myers. "UX Design Tools". In: *User Experience Methods and Tools in Human-Computer Interaction*. CRC Press, 2024, pp. 350–372.

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)

Hongyu Howie Wang, Jiya Gupta, **Nikolas Martelaro**. "Non-Emergency Notification Timing for Drivers Doing Non-Driving-Related Tasks in Autonomous Vehicles: An Interruptibility Study". In: *Proceedings of the 17th International Conference on Automotive User Interfaces and Interactive Vehicular Applications*. AutomotiveUI '25. Association for Computing Machinery, 2025, pp. 208–230. ISBN: 9798400720130. DOI: 10.1145/3744333.3747831. URL: https://doi.org/10.1145/3744333.3747831.

Rachel Shockley, Kai Herchenroether, Zeda Xu, **Nikolas Martelaro**, Christopher McComb. "The Impact of Design Representation on Equal Contribution In Engineering Design Teams". In: *Volume 4: 22nd International Conference on Design Education (DEC); 30th Design for Manufacturing and the Life Cycle Conference (DFMLC); 37th International Conference on Design Theory and Methodology (DTM)*. International Design Engineering Technical Conferences and Computers and Information in Engineering Conference. Aug. 2025, V004T06A024. DOI: 10.1115/DETC2025-168883. URL: https://doi.org/10.1115/DETC2025-168883.

Frederic Gmeiner, Kaitao Luo, Ye Wang, Kenneth Holstein, **Nikolas Martelaro**. "Exploring the Potential of Metacognitive Support Agents for Human-AI Co-Creation". In: *Designing Interactive Systems Conference*. DIS '25. Funchal, Portugal: ACM, July 2025, p. 26. DOI: 10.1145/3715336.3735785. URL: https://doi.org/10.1145/3715336.3735785.

Alice Xiaodi Tang, Hunter Akridge, **Nikolas Martelaro**, Sarah E. Fox. "At the Breaking Point: How Bus Operators Cope with Transit Technology Failures and What That Can Tell Us About the Integration of Future Innovations". In: *Designing Interactive Systems Conference*. DIS '25. Funchal, Portugal: ACM, July 2025, p. 14. DOI: 10.1145/3715336.3735728. URL: https://doi.org/10.1145/3715336.3735728.

Frederic Gmeiner, Nicolai Marquardt, Michael Bentley, Hugo Romat, Michel Pahud, David Brown, Asta Roseway, **Nikolas Martelaro**, Kenneth Holstein, Ken Hinckley, Nathalie Riche. "Intent Tagging: Exploring Micro-Prompting

Interactions for Supporting Granular Human-GenAI Co-Creation Workflows". In: *Proceedings of the 2025 CHI Conference on Human Factors in Computing Systems*. CHI '25. Association for Computing Machinery, Apr. 2025. ISBN: 9798400713941. DOI: 10.1145/3706598.3713861. URL: https://doi.org/10.1145/3706598.3713861.

Hyeonsu B Kang, David Chuan-En Lin, Yan-Ying Chen, Matthew K. Hong, **Nikolas Martelaro**, Aniket Kittur. "BioSpark: Beyond Analogical Inspiration to LLM-augmented Transfer". In: *Proceedings of the 2025 CHI Conference on Human Factors in Computing Systems*. CHI '25. Association for Computing Machinery, Apr. 2025. ISBN: 9798400713941. DOI: 10.1145/3706598.3714053. URL: https://doi.org/10.1145/3706598.3714053.

David Chuan-En Lin, Hyeonsu B. Kang, **Nikolas Martelaro**, Aniket Kittur, Yan-Ying Chen, Matthew K. Hong. "Inkspire: Supporting Design Exploration with Generative AI through Analogical Sketching". In: *Proceedings of the 2025 CHI Conference on Human Factors in Computing Systems*. CHI '25. Association for Computing Machinery, Apr. 2025. ISBN: 9798400713941. DOI: 10.1145/3706598.3713397. URL: https://doi.org/10.1145/3706598.3713397.

Humphrey Yang, I-Chao Shen, **Nikolas Martelaro**, Bo Zhu, Haoran Xie, Takeo Igarashi, Lining Yao. "CompAct: Designing Interconnected Compliant Mechanisms with Targeted Actuation Transmissions". In: *Proceedings of the 2025 CHI Conference on Human Factors in Computing Systems*. CHI '25. Association for Computing Machinery, Apr. 2025. ISBN: 9798400713941. DOI: 10.1145/3706598.3714307. URL: https://doi.org/10.1145/3706598.3714307.

Hunter Akridge, Bonnie Fan, Alice Xiaodi Tang, Chinar Mehta, **Nikolas Martelaro**, Sarah E Fox. ""The bus is nothing without us": Making Visible the Labor of Bus Operators amid the Ongoing Push Towards Transit Automation". In: *Proceedings of the CHI Conference on Human Factors in Computing Systems*. CHI '24. Honolulu, HI, USA: Association for Computing Machinery, 2024. ISBN: 9798400703300. DOI: 10.1145/3613904.3642714. URL: https://doi.org/10.1145/3613904.3642714.

Howard Ziyu Han, Franklin Mingzhe Li, Alesandra Baca Vazquez, Daragh Byrne, **Nikolas Martelaro**, Sarah E Fox. "Co-design Accessible Public Robots: Insights from People with Mobility Disability, Robotic Practitioners and Their Collaborations". In: *Proceedings of the CHI Conference on Human Factors in Computing Systems*. CHI '24. Honolulu, HI, USA: Association for Computing Machinery, 2024. ISBN: 9798400703300. DOI: 10.1145/3613904.3642875. URL: https://doi.org/10.1145/3613904.3642875.

David Chuan-En Lin, Fabian Caba Heilbron, Joon-Young Lee, Oliver Wang, **Nikolas Martelaro**. "Videogenic: Identifying Highlight Moments in Videos with Professional Photographs as a Prior". In: *Proceedings of the 16th Conference on Creativity & Cognition*. C&C '24. Chicago, IL, USA: Association for Computing Machinery, 2024, pp. 328–346. ISBN: 9798400704857. DOI: 10.1145/3635636.3656186. URL: https://doi.org/10.1145/3635636.3656186.

David Chuan-En Lin, Fabian Caba Heilbron, Joon-Young Lee, Oliver Wang, **Nikolas Martelaro**. "VideoMap: Supporting Video Exploration, Brainstorming, and Prototyping in the Latent Space". In: *Proceedings of the 16th Conference on Creativity & Cognition*. C&C '24. Chicago, IL, USA: Association for Computing Machinery, 2024, pp. 311–327. ISBN: 9798400704857. DOI: 10.1145/3635636.3656192. URL: https://doi.org/10.1145/3635636.3656192.

David Chuan-En Lin, **Nikolas Martelaro**. "Jigsaw: Supporting Designers to Prototype Multimodal Applications by Chaining AI Foundation Models". In: *Proceedings of the CHI Conference on Human Factors in Computing Systems*. CHI '24. Honolulu, HI, USA: Association for Computing Machinery, 2024. ISBN: 9798400703300. DOI: 10.1145/3613904.3641920. URL: https://doi.org/10.1145/3613904.3641920.

David Widder, Laura Dabbish, James Herbsleb, **Nikolas Martelaro**. "Power and Play: Investigating "License to Critique"' in Teams' AI Ethics Discussions". In: *To appear at the 27th ACM Conference on Computer-Supported Cooperative Work and Social Computing*. CSCW '24. San José, Costa Rica: Association for Computing Machinery, 2024. URL: https://arxiv.org/abs/2403.19049.

Michael Feffer, **Nikolas Martelaro**, Hoda Heidari. "The AI Incident Database as an Educational Tool to Raise Awareness of AI Harms: A Classroom Exploration of Efficacy, Limitations, & Future Improvements". In: *Proceedings of the 3rd ACM Conference on Equity and Access in Algorithms, Mechanisms, and Optimization*. EAAMO '23. Boston, MA, USA: Association for Computing Machinery, 2023. ISBN: 9798400703812. DOI: 10.1145/3617694.3623223. URL: https://doi.org/10.1145/3617694.3623223.

Frederic Gmeiner, Humphrey Yang, Lining Yao, Kenneth Holstein, **Nikolas Martelaro**. "Exploring Challenges and Opportunities to Support Designers in Learning to Co-Create with AI-Based Manufacturing Design Tools". In: *Proceedings of the 2023 CHI Conference on Human Factors in Computing Systems*. CHI '23. Hamburg, Germany: Association for Computing Machinery, 2023. ISBN: 9781450394215. DOI: 10.1145/3544548.3580999. URL: https://doi.org/10.1145/3544548.3580999.

David Chuan-En Lin, Anastasis Germanidis, Cristóbal Valenzuela, Yining Shi, **Nikolas Martelaro**. "Soundify: Matching Sound Effects to Video". In: *Proceedings of the 36th Annual ACM Symposium on User Interface Software and Technology*. UIST '23. San Francisco, CA, USA: Association for Computing Machinery, 2023. ISBN: 9798400701320. DOI: 10.1145/3586183.3606823. URL: https://doi.org/10.1145/3586183.3606823.

Nikolas Martelaro, Patrick Carrington, Sarah Fox, Jodi Forlizzi. "Designing an Inclusive Mobile App for People with Disabilities to Independently Use Autonomous Vehicles". In: *Proceedings of the 14th International Conference on Automotive User Interfaces and Interactive Vehicular Applications*. AutomotiveUI '22. Seoul, Republic of Korea: Association for Computing Machinery, 2022, pp. 45–55. ISBN: 9781450394154. DOI: 10.1145/3543174.3546850. URL: https://doi.org/10.1145/3543174.3546850.

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)

Faria Huq, Jeffrey P. Bigham, **Nikolas Martelaro**. "What's important here?: Opportunities and Challenges of LLM in retrieving information from Web Interface". In: *Ro-FoMo:Robustness of Few-shot and Zero-shot Learning in Large Foundation Models*. 2023. URL: https://openreview.net/forum?id=Jd8mD3SU8j.

Hyeonsu B Kang, David Chuan-En Lin, **Nikolas Martelaro**, Aniket Kittur, Yan-Ying Chen, Matthew K Hong. "BioSpark: An End-to-End Generative System for Biological-Analogical Inspirations and Ideation". In: *NeurIPS 2023 Workshop on Machine Learning for Creativity and Design*. 2023. URL: https://arxiv.org/abs/2312.11388.

Frederic Gmeiner, Kenneth Holstein, **Nikolas Martelaro**. "Team Learning as a Lens for Designing Human–AI Co-Creative Systems". In: *Workshop on Generative AI and HCI at ACM Conference on Human-Computer Interaction (CHI '22)*. 2022.

Nikolas Martelaro, Carol Smith, Tamara Zilovic. "Exploring Opportunities in Usable Hazard Analysis Processes for AI Engineering". In: *AAAI Spring Symposium Series Workshop on AI Engineering: Creating Scalable, Human-Centered and Robust AI Systems*. 2022.

Hongyu Wang, **Nikolas Martelaro**. "End-User Puppeteering of Expressive Movement". In: *Workshop on EUP/PD Workshop at ACM/IEEE Conference on Human-Robot Interaction (HRI '22)*. 2022.

Hongyu Wang, **Nikolas Martelaro**. "Teaching Robots Expressive Movements through Puppeteering". In: *Workshop on Human-Interactive Robot Learning (HIRL) at ACM/IEEE Conference on Human-Robot Interaction (HRI '22)*. 2022.

David Weinberg, Healy Dwyer, Sarah Fox, **Nikolas Martelaro**. "Sharing the Sidewalk: Analyzing Autonomous Delivery Robot Interactions with Pedestrians". In: *Workshop on Human-Robot Interaction in Public Spaces at ACM/IEEE Conference on Human-Robot Interaction (HRI '22)*. 2022.

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)

David Chuan-En Lin, Hyeonsu B Kang, **Nikolas Martelaro**, Aniket Kittur, Yan-Ying Chen, Matthew K. Hong. "Inkspire: Sketching Product Designs with AI". In: *Adjunct Proceedings of the 37th Annual ACM Symposium on User Interface Software and Technology*. UIST Adjunct '24. Pittsburgh, PA, USA: Association for Computing Machinery, 2024. ISBN: 9798400707186. DOI: 10.1145/3672539.3686339. URL: https://doi.org/10.1145/3672539.3686339.

Howard Han, Franklin Mingzhe Li, **Nikolas Martelaro**, Daragh Byrne, Sarah E Fox. "The Robot in Our Path: Investigating the Perceptions of People with Motor Disabilities on Navigating Public Space Alongside Sidewalk Robots". In: *Proceedings of the 25th International ACM SIGACCESS Conference on Computers and Accessibility*. ASSETS '23. New York, NY, USA: Association for Computing Machinery, 2023. ISBN: 9798400702204. DOI: 10.1145/3597638.3614508. URL: https://doi.org/10.1145/3597638.3614508.

Chengzhi Zhang, Weijie Wang, Paul Pangaro, **Nikolas Martelaro**, Daragh Byrne. "Generative Image AI Using Design Sketches as Input: Opportunities and

Challenges". In: *Proceedings of the 15th Conference on Creativity and Cognition*. C&C '23. Virtual Event, USA: Association for Computing Machinery, 2023, pp. 254–261. ISBN: 9798400701801. DOI: 10.1145/3591196.3596820. URL: https://doi.org/10.1145/3591196.3596820.

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

Tao Long, Sitong Wang, Émilie Fabre, Tony Wang, Anup Sathya, Jason Wu, Savvas Dimitrios Petridis, Ding Li, Tuhin Chakrabarty, Yue Jiang, Jingyi Li, Tiffany Tseng, Ken Nakagaki, Qian Yang, **Nikolas Martelaro**, Jeffrey V Nickerson, Lydia B Chilton. "Facilitating Longitudinal Interaction Studies of AI Systems". In: *Adjunct Proceedings of the 38th Annual ACM Symposium on User Interface Software and Technology*. UIST Adjunct '25. Association for Computing Machinery, 2025. ISBN: 9798400720369. DOI: 10.1145/3746058.3758469. URL: https://doi.org/10.1145/3746058.3758469.

Daniel Russell, Q. Vera Liao, Chinmay Kulkarni, Elena L. Glassman, **Nikolas Martelaro**. "Human-Computer Interaction and AI: What Practitioners Need to Know to Design and Build Effective AI System from a Human Perspective". In: *Extended Abstracts of the 2023 CHI Conference on Human Factors in Computing Systems*. CHI EA '23. Hamburg, Germany: Association for Computing Machinery, 2023. ISBN: 9781450394222. DOI: 10.1145/3544549.3574170. URL: https://doi.org/10.1145/3544549.3574170.

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.

Policy Briefs

Nikolas Martelaro, Sarah Fox, Jodi Forlizzi, Raj Rajkumar, Chris Hendrickson, Stan Caldwell. *How to Make Sense of Bus Transit Automation? Considerations for policy makers on the future of human-automation teaming in the transit workforce*. Tech. rep. Carnegie Mellon University, 2022. URL: https://www.cmu.edu/traffic21/research-and-policy-papers/traffic21-policy-brief-22.1---apr-14-002.pdf.

Patents

Chuan-En Lin, Hyeonsu B Kang, **Nikolas A Martelaro**, Aniket D Kittur, Yin-Ying Chen, Matthew K Hong. *Systems and methods for creating a realistic scene including a generative drawing using learning models*. US Patent App. 18/640,882. Aug. 2025.

Chuan-En Lin, Hyeonsu B Kang, **Nikolas A Martelaro**, Aniket D Kittur, Yin-Ying Chen, Matthew K Hong. *Systems and methods for generating creative sketches using models guided by sketches and text*. US Patent App. 18/640,519. Aug. 2025.

Chuan-En Lin, Hyeonsu B Kang, **Nikolas A Martelaro**, Aniket D Kittur, Yin-Ying Chen, Matthew K Hong. *Systems and methods for generating designs using analogics with learning models*. US Patent App. 18/591,578. Apr. 2025.

Hyeonsu B Kang, Chuan-En Lin, **Nikolas A Martelaro**, Aniket D Kittur, Yin-Ying Chen, Matthew K Hong. *Systems and methods for generating natural solutions to a design task by a learning model*. US Patent App. 18/423,928. Mar. 2025.

Nikolas Martelaro, Alex M. Kass, Robert P. Dooley, Charles Jacob Foster. "Intelligent design platform using digital assistants for design process support". US20210365599A1. Nov. 2021. URL: https://patents.google.com/patent/US20210365599A1/en.

Nikolas Martelaro, Maria Pilar Ergueta McGinley. "Recommendation engine for design components". US20210264296A1. Aug. 2021. URL: https://patents.google.com/patent/US20210264296A1/en.

David William Vinson, Matthew Thomas Short, Alex Kass, Mary Elizabeth Hamilton, Sunil Shettigar, **Nikolas Martelaro**, Kahlil Gibran Fitzgerald. "Platform for generating interactive experiences at sports venues". US20210089770A1. Mar.

2021. URL:
https://patents.google.com/patent/US20210089770A1/en.

RESEARCH GRANTS

Federal Grants

2025-2028 **SCC-IRG: Public Space Robotics: Community-Driven Models for Social Navigation and Communication #2531320**
Funding Body: National Science Foundation
Investigators: Nikolas Martelaro (PI), Sarah Fox (Co-PI), Corey Harper (Co-PI), Ding Zhao (Co-PI)
Amount: $1,250,000

2024-2027 **REU Site: Human-Computer Interaction at Carnegie Mellon University (HCI REU) CSE #2349558**
Funding Body: National Science Foundation
Investigators: Laura Dabbish (PI), Nikolas Martelaro (Co-PI)
Amount: $486,606

2023 **WORKSHOP: Doctoral Consortium at ACM DIS 2023 IIS #2327585**
Funding Body: National Science Foundation
Investigators: Daragh Byrne (PI), Nikolas Martelaro (Co-PI)
Amount: $20,000

2022-2023 **Using Technology to Transform Makers into Creative Entrepreneurs IIS #2222719**
Funding Body: National Science Foundation - Future of Work at the Human-Technology Frontier
Investigators: Nikolas Martelaro (PI), Wendy Ju (Co-PI), Laura Dabbish (Co-PI), Yasmine Kotturi (Co-PI)
Amount: $145,543

2021-2024 **Supporting Designers in Learning to Co-create with AI for Complex Computational Design Tasks IIS #2118924**
Funding Body: National Science Foundation - Cyberlearning & Future Learning Technology
Investigators: Nikolas Martelaro (PI), Lining Yao (Co-PI), Kenneth Holstein (Co-PI)
Amount: $886,000

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 CNS #2125350
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

2026 **Google - Lab Gift**
Investigators: Nikolas Martelaro (PI)
Amount: $30,000 (in Gemini Credits)

2025–2026 **Adobe - Lab Gift**
Investigators: Nikolas Martelaro (PI)
Amount: $20,000

2025–2026 **BMW - Investigation on robotics applications**
Investigators: Nikolas Martelaro (PI)
Amount: $34,000

2025–2026 **Seoul National University - Interaction Design for Optimization Systems**
Investigators: Nikolas Martelaro (PI), Scott Hudson (Co-PI)
Amount: $54,764

2024 **Honda Research Institute - Rapid Prototyping of Computer Systems Course Sponsor**
Investigators: Nikolas Martelaro (PI)
Amount: $20,000

2024–2025 **BMW - Identifying Moments of Driver Confusion in Cars**
Investigators: Nikolas Martelaro (Co-PI), Aaron Steinfeld (Co-PI)
Amount: $86,500

2024 **Honda Research Institute - Rapid Prototyping of Computer Systems Course Sponsor**
Investigators: Nikolas Martelaro (PI)
Amount: $19,417

2023 **Honda Research Institute - Rapid Prototyping of Computer Systems Course Sponsor**
Investigators: Nikolas Martelaro (PI)
Amount: $7,500

2023–2026 **Toyota Research Institute - Supporting Designer Creativity Through Analogical Search and Design Constraint Management**
Investigators: Anniket Kittur (Co-PI), Nikolas Martelaro (Co-PI)
Amount: $932,907

2023–2025 **Honda Research Institute - Automatic Prediction Whether Users Detect Changes to Virtual Content in Multi-Agent Interactions**
Investigators: David Lindlbauer (Co-PI), Nikolas Martelaro (Co-PI)
Amount: $640,460

2021–2022 **Software Engineering Institute - Hazard Analysis for AI Engineering**
Investigators: Nikolas Martelaro (PI), Carol Smith (Co-PI)
Amount: $100,000

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

2025 **Best Paper, CSCW '25.** Punctuated and Prolonged: A Workers' Inquiry into Infrastructural Failures in Bus Transit. *Hunter Akridge, Alice Xiaodi Tang, Nikolas Martelaro, Sarah E. Fox.*

2023 **Best Paper Honorable Mention, CHI '23.** Exploring Challenges and Opportunities to Support Designers in Learning to Co-create with AI-based Manufacturing Design Tools. *Frederic Gmeiner, Humphrey Yang, Lining Yao, Kenneth Holstein, and Nikolas Martelaro.*

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

2025 **Developing design processes that prompt designerly reflection**
Workshop on Human-Centered Machine Learning, hosted by Apple
August 19, 2025

2025 **Human-AI Teaming in Generative CAD Environments**
4th Workshop on Trends in Human-AI Teaming for Engineering Design: All About CAD at the 2025 International Design Engineering Technical Conferences & Computers and Information in Engineering Conference (IDTC-CIE)
August 19, 2025

2025 **Sharing the Sidewalk**
Building Bridges for Public Robots
June 16, 2025

2025 **The AI Augmented Designer**
Workshop on AI in Service Design at Politecnico Milano
June 09, 2025

2025 **Augmenting Designer Thought**
UC San Diego Design Lab
January 08, 2025

2024 **Building to See, Building to Act: Creating Interactive Devices to Help You Observe and Prototype Interactions In-the-Wild. CMU Portugal Academy.**
Novermber 29, 2024

2024 **Moderator - Reflective Pactices with AI - Halfway to the Future Symposium. Santa Cruz, CA**
October 22, 2024

2024 **Augementing Design Capabilities - Human-Centered Computing Seminar Series at the University of Minnesota**
October 11, 2024

2023 **Technische Hochschule Ingolstadt - Guest Professor**
December 12, 2023–December 21, 2023

2022 **Clemson University - Guest Talk**
December 2, 2022

2022 **Berkeley Integrated Design - Guest Talk**
November 15, 2022

2021 **Autodesk Research - Guest Talk**
September 30, 2021

2020 **Talking Robotics**
December 11, 2020
https://talking-robotics.github.io/talks/nikolas/

SELECTED PRESS COVERAGE

2025 **CMU News** *Building better robots for sidewalk safety*
https://cee.engineering.cmu.edu/news/2025/10/06-public-space-robotics.html

2025 **Wired** *DoorDash's New Delivery Robot Rolls Out Into the Big, Cruel World*
https://www.wired.com/story/doordash-dot-delivery-robot/

2024

CMU News *Robots Could Clear Snow, Assist at Crosswalks, Monitor Sidewalks for Traffic* https://www.cmu.edu/news/stories/archives/2024/june/robots-could-clear-snow-assist-at-crosswalks-monitor-sidewalks-for-traffic

2023 **Associated Press** *San Francisco launches driverless bus service following robotaxi expansion* https://apnews.com/article/autonomous-driverless-buses-robotaxi-san-francisco-802c39fdfc57adccaea604c7ee13a128

2022 **StreetsBlog USA** *Will 'Autonomous' Buses Force Drivers Out of a Job — Or Make Them More Important Than Ever?* https://usa.streetsblog.org/2022/05/31/will-autonomous-buses-force-drivers-out-of-a-job-or-make-them-more-important-than-ever/

2022 **Smart Cites Dive** *Autonomous transit buses will still need skilled operators, researchers say* https://www.smartcitiesdive.com/news/autonomous-transit-buses-need-drivers/624053/

2022 **Pittsburgh City Paper** *Human operators still essential in autonomous vehicles, says new CMU report* https://www.pghcitypaper.com/pittsburgh/human-operators-still-essential-in-autonomous-vehicles-says-new-cmu-report/Content?oid=21743919

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 2026 **The AI Augmented Designers**
05-499A/05-899A

Fall 2025 **The AI Augmented Designers**
05-499A/05-899A

Spring 2025 **Rapid Prototyping of Computer Systems**
05-540/05-872/18-540/18-745/39-648

Fall 2024 **Design of AI Products and Services**
05-317/05-617

Spring 2024 **Rapid Prototyping of Computer Systems**
05-540/05-872/18-540/18-745/39-648

Fall 2023 **Design of AI Products and Services**
05-317/05-617

Spring 2023 **Rapid Prototyping of Computer Systems**
05-540/05-872/18-540/18-745/39-648

Fall 2022 **Design of AI Products and Services**
05-317/05-617

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

2025– **Gati Aher** *Co-advised with tom Mitchell*
Human-Computer Interaction Institute, Carnegie Mellon University

2024– **Howard Han**
Human-Computer Interaction Institute, Carnegie Mellon University

2023–2024 **Humphrey Yang** *Co-advised with Lining Yao*
Dissertation Title: *Beyond Automation: Supporting Human-Computer Collaboration in Designing with Active Materials and Mechanisms*
Human-Computer Interaction Institute, Carnegie Mellon University

2022– **Zeda Xu** *Co-advised with Chris McComb*
Mechanical Engineering, Carnegie Mellon University

2022– **Alice Tang** *Co-advised with Daragh Byrne*
Human-Computer Interaction Institute, Carnegie Mellon University

2022– **Howie Wang** Human-Computer Interaction Institute, Carnegie Mellon University

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

2026– **Kihoon Son**
Dissertation Title: *Capturing and Embodying Tacit Knowledge through Engagement with Generative AI in Creative Workflows*
KAIST School of Computing

2025– **Nathan DeViro**
Dissertation Title: *Addressing the Input Gap on Mobile Devices*
Human-Computer Interaction Institute, Carnegie Mellon University

2025– **Noor Hammad**
Dissertation Title: *Towards Trace-Aware Creativity Tools*
Human-Computer Interaction Institute, Carnegie Mellon University

2024 **Julia Cambre**
Dissertation Title: *Designing for Voice in Context*
Human-Computer Interaction Institute, Carnegie Mellon University

2023 **Jianzhe Gu**
Dissertation Title: *Computational Design of Morphing Looped Graph Structures*
Human-Computer Interaction Institute, Carnegie Mellon University

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

2026 **Subcommittee Chair**
ACM Conference on Designing Interactive Systems (DIS)
AI & Design Subcommittee

2025– **Associate Editor**
Transaction on Human-Robot Interaction

2025 & 2026 **Registration Chair**
ACM Conference on Creativity & Cognition (C&C)

2024 **Theme Chair**
Halfway to the Future
Hybrid Knowing with Machines

2024 **Design Competition Chair**
International Symposium on Robot and Human Interactive Communication (RO-MAN)

2024 **Registration Chair**
ACM Conference on Automotive User Interfaces (AutoUI)

2025 **Program Committee Member**
ACM Conference on Designing Interactive Systems (DIS)
AI and Design Subcommittee

2024 **Program Committee Member**
ACM Conference on Human Factors in Computing Systems (CHI)
Understanding People Subcommittee

2023 **Program Committee Member**
ACM Conference on Human Factors in Computing Systems (CHI)
Understanding People Subcommittee

2023 **General Chair**
ACM Conference on Designing Interactive Systems (DIS)

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 in Designing Interactive Systems (DIS)
ACM Conference on Computer Supported Collaborative Work (CSCW)
ACM/IEEE Human-Robot Interaction Conference (HRI)
ACM Conference in Automotive User interfaces (AutoUI)
Design Science
Design Studies
Frontiers Robotics
Journal of Human-Computer Interaction Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies (IMWUT)
Transactions ofn Human-Robot Interaction

University Service

2026 **MHCI Admissions Committee**
Human-Computer Interaction Institute, Carnegie Mellon University

2025–2026 **HCII Awards Committee**
Human-Computer Interaction Institute, Carnegie Mellon University

2025 **MHCI Admissions Committee**
Human-Computer Interaction Institute, Carnegie Mellon University

2025 **REU Admissions Committee**
Human-Computer Interaction Institute, Carnegie Mellon University

2024-2026 **Design Curriculum Committee Co-Lead**
Human-Computer Interaction Institute, Carnegie Mellon University

2024-2025 **Faculty Hiring Committee**
Human-Computer Interaction Institute, Carnegie Mellon University

2024 **REU Admissions Committee**
Human-Computer Interaction Institute, Carnegie Mellon University

2023 **Ph.D. Admissions Committee**
Human-Computer Interaction Institute, Carnegie Mellon University

2021-2023 **Faculty Senate**
Human-Computer Interaction Institute, Carnegie Mellon University

2022 **MHCI Admissions Committee**
Human-Computer Interaction Institute, Carnegie Mellon University

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

2020–2022 **Design Studio Curriculum Task Force**
Human-Computer Interaction Institute, Carnegie Mellon University

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