NICHOLAS A. GIUDICE, PhD

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CURRICULUM VITAE

University of Maine
Spatial Computing Program
School of Computing & Information Science
348 Boardman Hall
Orono, ME 04469-5711

LAB: 207-581-2151
FAX: 207-581-2206
nicholas.giudice@maine.edu
www.umaine.edu/vemi

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1. EDUCATION AND PROFESSIONAL TRAINING

2005-2008 Postdoctoral Fellow, Psychological and Brain Sciences: Cognition, Perception, and Cognitive Neuroscience Program. Sponsor: Prof. Jack M. Loomis, University of California, Santa Barbara (UCSB).

1998-2004 Ph.D., Psychology: Cognitive and Brain Sciences Program. Advisors: Prof. Gordon E. Legge and Prof. Herbert L. Pick, University of Minnesota (UMN), Twin Cities, MN.

1993-1997 B.A., (Magna Cum Laude), Psychology and Philosophy. Providence College (PC), Providence, RI.

2. PROFESSIONAL POSITIONS AND AFFILIATIONS

2.1 Academic Positions (9):

2021-Present Full Professor, Spatial Computing Program: School of Computing & Information Science (SCIS), The University of Maine.

2020-Present Chief Research Scientist, Virtual Environments and Multimodal Interaction (VEMI) Laboratory, The University of Maine.

2018-2020 Full Professor, Spatial Informatics Program: School of Computing & Information Science (SCIS), The University of Maine.

2017-2018 Director, National Center for Geographic Information and Analysis (NCGIA), The University of Maine.

2016-Present Coordinator, Human-Computer Interaction (HCI) minor, The University of Maine.

2013-2018 Associate Professor, Spatial Informatics Program: School of Computing & Information Science, The University of Maine.

2011-2013 Assistant Professor, Spatial Informatics Program: School of Computing & Information Science, The University of Maine.

2008-2019 Founding Director, Virtual Environments and Multimodal Interaction (VEMI) Laboratory, The University of Maine.

2008-2011 Assistant Professor, Dept. of Spatial Information Science and Engineering, The University of Maine.

2.2 Cooperative Appointments and invited positions (4):

2018-Present Ombudsperson for the Clinical training program, Department of Psychology, UMaine.

2017-Present Faculty Associate, Center on Aging, UMaine.

2009-Present Cooperating Faculty, Department of Psychology, UMaine.

2008-2019 Joint appointment, National Center for Geographic Information and Analysis (NCGIA), UMaine.

2.3 Editorial Positions (4):

2020-2021 Co-editor for Spatial Cognition and Computation special issue on Geographic Information, Human-Computer Interaction, and Navigation.

2017-Present Editorial Board, ACM Transactions on Accessible Computing (TACCESS), the official journal for the ASSETS International Conference and the premier journal on the latest research, policy, and technology in computing fields relating to accessibility, inclusion, and disability.

2016-Present Editorial Board (Associate Editor) Assistive Technology, the official journal of the Rehabilitation Engineering & Assistive Technology Society of North America (RESNA).

2015 Co-editor for the IEEE Transactions on Haptics, special issue on haptics and accessibility.

2.4 Professional Positions: Directorships and Board Memberships (10):

2024-present Transportation Equity Specialist on the Greater Portland Council of Governments (GPCOG) Policy Board. Providing input and guidance on transportation access issues and needs of under-served and disabled people.

2018-2022 Invited Member of the National Academies of Science, Transportation Research Board on Autonomous vehicle safety.

2017-Present Co-founder, President, & Chief Research Officer, Unar Labs, LLC. A start-up company developing multimodal information access technologies promoting universal access to digital information and graphical content without sensory bounds.

2017-2022 Scientific advisory board, ClickAndGo Wayfinding Maps LLC. A company promoting "independent mobility for everyone" through the combined use of tactile and narrative maps, real-time location information, and an accessible iOS navigation app.

2016-Present Board of Directors, The Iris Network. A nonprofit organization advancing policy, research, and training to assist BVI people across the nation in attaining employment, independence, and community integration.

2015-Present Partner, Access Computing Alliance. A national consortium of university and industrial affiliates working to increase the participation of women, people with disabilities, and other underrepresented groups in post-secondary computing fields and STEM careers.

2015-Present Scientific advisory board, AIRA Tech Corp. A San Diego-based start-up company providing blind and visually impaired (BVI) users with remote real-time information access via the smartphone using trained human agents.

2015-Present Founder and CEO, Unizign Research LLC.

2015-2022 Board of Directors (chairman 2016-2018), American Council of the Blind (ACB) of Maine. A leading advocacy organization for BVI-related issues.

2015-2018 Board of Directors, Maine Organization for Blind Athletic and Leadership Education (MOBALE). An innovative nonprofit organization providing year-round sports education and leadership opportunities for young BVI athletes around New England.

3. RESEARCH OVERVIEW

About Giudice webpage: https://umaine.edu/vemi/facultystudents/dr-nicholas-giudice/

VEMI Lab webpage: http://www.umaine.edu/vemi

3.1 Research Summary

My research program is both interdisciplinary and translational, combining principles and methodologies from human perception, cognitive neuroscience, and human-computer interaction. I am the founder and Chief Research Scientist of the VEMI lab, a one-of-a-kind educational, research, and development facility built on an innovative operating model combining theory and practice from creative arts, science, and interface design. Our mission is to envision, develop, and evaluate human-inspired nonvisual, enhanced visual, and Multimodal information access technologies for improving

environmental awareness, spatial learning, navigation behavior, and inclusive transportation. Our solutions make a difference in people's lives by providing immediate benefits on the information access needs of blind/visually impaired people (representing 12 million persons in the U.S. and 285 million worldwide), as well as older adults experiencing vision loss (most visual impairment is age-related and the reality is that 70-year-old eyes are not as keen as 20-year-old eyes). Visual impairment need not be physical or permanent, sighted people are also frequently "blind" to their environment. Our research program addresses these scenarios based on solutions for what we call situational blindness (e.g., texting while walking), eyes-free applications (such as performing a secondary task while driving), and when accurate imagination requires more than visual information (such as for understanding the sight/sound characteristics of a new windfarm installation). Current research is also investigating the collaboration of human intelligence (HI) and artificial intelligence (AI) in the design and operation of autonomous vehicles (AVs), especially as relates to accessible usage by older adults and BVI people. My experiences as a congenitally blind person provide me with unrivaled first-hand knowledge about the needs and challenges of this demographic and key insight of what works and doesn't work for the design of nonvisual information access and navigational technology, something that is often misunderstood by researchers/designers/engineers without this first-hand phenomenology.

3.2 Research Interests

- Multimodal Spatial Cognition: Studying how we learn about, represent, and navigate our environment using different sensory modalities (3D sound, touch, vision, and language).
- Multisensory Information Access Technology: Researching and designing multimodal interfaces to improve environmental awareness, navigation, and information access.
- Multisensory Visualization and Interactive Design: Improving human perception, imagination, and interpretation of complex data/information using immersive virtual and augmented reality tools and naturalistic 3D multisensory simulations.
- User Trust and inclusive design of fully autonomous vehicles and human-vehicle collaboration (HVC).

4. COMPETITIVE GRANTS & RESEARCH SUPPORT (PI/Co-PI of ~$17 million)

Grant values indicated as follows: UMaine grants (Giudice $ Amount / Total Grant award $ Amount) and multi-institution grants (Giudice-UMaine $ Amount / Total Grant award $ Amount) If only one value is in parenthesis, then the full grant amount was under Giudice/UMaine expenditure control.

Summary Metrics:

- *PI or Co-PI of over $17 million in grants, contracts and prizes, with direct management of ~$7 million to support VEMI's research program*
- *29 extramural grants and supplements, 15 industrial collaborations, and 21 internal grants*
- *Over 30 national / international collaborators*
- *University leading undergraduate student research awards*

4.1 Extramural Grants (17) ($6,146,477 / $13,209,962):

09/01/2024-08/31/2027 NSF EES 2348189 "Collaborative Research: An Intelligent Natural Language Interface to Improve the Accessibility of Complex Data Tasks for Blind or Visually Impaired STEM Employees"; ($100,424 / $833,269), developing new voice-enabled interactions and multisensory I/O UIs supporting accessible reading, manipulation, and transformation of complex data tables (N.A. Giudice, UMaine PI; with H.P. Palani, Northeastern University, PI; M. Tory, the Roux Institute; and S.A. Doore, Colby College).

09/01/2023-06/30/2027	NIH/NEI R01, 1R01EY035433-01: “Maps as a service: A systematic approach to the production of tactile and audio/vibrational maps for visually impaired users”; ($468,760/ $1,387,199), comparing traditional tactile and vibro-audio maps (VAMs) for spatial learning, and design considerations (N.A. Giudice (UMaine PI) with R. Manduchi, UC Santa Cruz (PI)).
08/01/2023-07/31/2026	NSF HCC-IIS2312402: “Multisensory maps for inclusive indoor navigation by people with visual impairments”; ($813,117 / $1,126,197), designing and testing new multisensory indoor route maps for use on smart devices (N.A. Giudice (PI) with H.P. Palani, (Northeastern University).
10/01/2021-09/30/2025	NSF HCC-IIS2106393: “Investigating Inclusive Data Science Tools to Overcome Statistics Anxiety”; ($345,615 / $1,301,867), designing and evaluating the Relatable Online Accessible Data Science (ROADS) platform, a tool to improve online data science understanding and accessibility for college students (N.A. Giudice, UMaine pi; with A.M. Stefik, University of Nevada, Las Vegas (PI) & J.L. Gorlewicz, Saint Louis University).
06/01/2021-05/31/2025	NSF ITEST grant DRL 2048394: “Collaborative Research: Creating and testing data science learning tools for secondary students with disabilities”; ($303,549 / $1,347,175), designing and evaluating information-access technology to support STEM education and data science understanding by high school students (N.A. Giudice, UMaine PI; with A.M. Stefik University of Nevada, Las Vegas (PI); J. Gorlewicz, Saint Louis University; and D.W. Smith, University of Alabama, Huntsville).
10/01/2019-09/30/2023	NSF grant CHS-1910603, “Improving user trust of autonomous vehicles through human-vehicle collaboration” ($499,898). Development of human-vehicle collaboration profiles to improve user trust, usability, and accessibility of fully autonomous vehicles (N.A. Giudice, PI; with R.R. Corey).
07/01/2018-07/31/2023	NSF grant: IIS-1822800 “A remote multimodal learning environment to increase graphical information access for blind and visually impaired students”; ($660,261 / $747,894), developing an accessible, remotely deployed STEM-learning platform for BVI students (N.A. Giudice, pi; with J.K. Dimmel, UMaine; and S.A. Doore, Colby College).
01/16/2017-12/31/2021	NSF grant ECR DCL Level 2 1644471: “Perceptual and Implementation Strategies for Knowledge Acquisition of Digital Tactile Graphics for Blind and Visually Impaired Students”; ($282,795 / $916,798), designing and evaluating information-access technology to support STEM education by BVI people (N.A. Giudice, UMaine pi; with J. Gorlewicz, Saint Louis University (PI); D.W. Smith, University of Alabama, Huntsville; and A.M. Stefik, University of Nevada, Las Vegas).
01/01/2019-12/31/2020	NEH grant PR-263888-19, “Accessible Civil Rights Heritage Project” ($89,764 (VEMI) / $277,439). Development and usability testing of an automated tool providing BVI access to films and video (N.A. Giudice, UMaine PI; with R.R. Corey, (UMaine); and M. Williams (PI) and J. Bell, Dartmouth College).

02/01/2015-01/31/2019	NIH grant R01-EY019924-07: "Audio-Haptic Virtual Environments for Large-Scale Navigation in the Blind"; ($140,592 / $433,596), researching behavioral and neuroimaging effects of multimodal interfaces on spatial learning without vision (N.A. Giudice, UMaine PI; with L. Merabet, Harvard (PI); and K. Sathian, Emory).
09/01/2014-08/31/2019	NSF grant CHS-#1425337, "Non-visual Access to Graphical Information Using a Vibro-Audio Display" ($499,853), researching graph/map access using touchscreen-based devices (N.A. Giudice, PI).
10/01/2010-09/30/2016	NSF grant CDI-1028895, "Perception of Indoor Scene Layouts by Machines and Visually Impaired Users" ($700,739 / $1,275,444), studying automated conversion of visual images into a common spatial format suitable for linguistic output (N.A. Giudice, UMaine co-PI; with K. Beard, UMaine (PI); R. Moratz, UMaine; L.J. Latecki, Temple University; and K. Daniilidis, UPenn).
09/15/2009-08/31/2014	NSF grant IIS-0916219, "Information Integration and Human Interaction for Indoor and Outdoor Spaces" ($478,715), researching formal models and user interactions for seamless navigation of OI spaces (N.A. Giudice, Co-PI; with M. Worboys, PI).
08/01/2009-07/31/2012	NIH grant R01-EY016817, "Multimodally encoded spatial images in sighted and blind" ($269,650 / $602,302), researching functional equivalence and amodal spatial representations (N.A. Giudice, UMaine PI; with J.M. Loomis, UCSB, PI; and R.L. Klatzky, CMU).
09/15/2008-08/31/2013	NSF grant CDI-0835689, "Cyber Enhancement of Spatial Cognition for the Visually Impaired" ($275,998 / $1,171,402), researching a non-visual indoor navigation system (N.A. Giudice, UMaine PI; with K. Daniilidis, UPenn, PI; S. Roumeliotis, UMN; and R. Manduchi, UCSC).
04/01/2008-07/31/2009	NSF grant BCS-0745328, "Spatial Images from Vision, Touch and Hearing" ($25,215 / $119,382), researching functional equivalence and amodal spatial representations (N.A. Giudice, UMaine PI; with J.M. Loomis, UCSB (PI); and R.L. Klatzky, CMU).
01/01/2005-12/31/2008	NIH postdoctoral NRSA grant EY-015963, "Spatial Learning with Multiple Sensory Modalities" ($191,532), researching multimodal spatial cognition in blind and sighted people (N.A. Giudice, PI).

<u>4.2 Commercial Contracts and Industrial Collaborations (15) ($1,095,010 / $4,067,596):</u>

07/15/2023-12/31/2024	Corporate contract with VEMI Lab (Master Research/Service Agreement, under NDA) on vehicle ingress, orientation, and Egress for BVI Users ($157,817) (N.A. Giudice (PI) and R.R. Corey (Co-PI), UMaine, with industrial partner).
01/01/2022-03/31/2023	Corporate contract with VEMI Lab (Master Research/Service Agreement, under NDA) on haptic UIs and BVI accessibility ($97,689) (N.A. Giudice (PI) and R.R. Corey (Co-PI), UMaine, with industrial partner).
09/01/2020-08/31/2022	NIH SBIR Phase I Grant #1R43EY032008-01, "Development of a haptic guidance interface for eliminating veering during indoor and outdoor navigation by blind and visually impaired travelers" ($28,999/

	$218,583), evaluating a new real-time haptic guidance interface (N.A. Giudice, UMaine pi; with Global Tactile Technologies, LLC (PI)
02/01/2019-01/31/2020	NSF Phase I grant #1843485, "Development of a Multimodal Interface for improving independence of Blind and Visually-Impaired people" ($61,704 (VEMI) / $225,000). Development and usability testing of automated graphical access software (R.R. Corey, UMaine PI; with H.P. Palani (PI) and N.A. Giudice, Unar Labs).
10/01/2018-07/31/2019	RRF Phase II: MIRTA Technology Accelerator Program, "Customer Discovery and Market Validation of Midlina - a multimodal software solution providing blind and visually-impaired people with access to digital graphical information" ($35,000). Customer needs assessment (N.A. Giudice, PI; with H.P. Palani).
07/01/2018-06/30/2019	MTI grant, "Augmented Reality Standardized Patient Simulator"; ($22,080 / $38,000), developing a real-time AR tool for training and field-based diagnostics (N.A. Giudice, UMaine (co-PI) with R.R. Corey; and Zephyrus Simulation).
11/01/2017-04/30/2019	NSF Icorp 1758174, "Touchscreen-based Graphics for Blind and Visually-impaired people" ($50,000), aimed at market analysis for commercialization of access technology (N.A. Giudice, UMaine (PI) with H.P. Palani, UMaine and V. Buble).
09/30/2017-09/29/2020	NIH STTR Phase I grant EY-027623, "Roboglasses® electronic travel aid with hands free obstacle avoidance for blind and vision impaired users"; ($132,000 / $210,281), R&D project for real-time head-level obstacle awareness using multimodal feedback (N.A. Giudice, UMaine PI; with Fauxsee Innovations LLC., PI, Little Rock, AR).
07/01/2015-06/30/2018	NSF Phase II STTR Grant: IIP-1534010, "An Assistive Tool to Locate People and Objects with a Multimodal Thermogram Interface" ($225,000 / $749,560), researching accessible smartphone interfaces for detecting people and object locations without vision (N.A. Giudice, UMaine PI, with MOAI Technologies, PI, Minneapolis, MN).
2017	NVDIA Inc. GPU $1000 award to support VEMI Research on AR and computer vision (N.A. Giudice, PI, with J.D. Cole).
01/01/2014-12/31/2014	NSF Phase I STTR Grant: IIP-1346292, "An Assistive Tool to Locate People and Objects with a Multimodal Thermogram Interface" ($68,891 / $224,503), researching accessible smartphone interfaces for detecting people and object locations without vision (N.A. Giudice, UMaine PI, with MOAI Technologies, PI, Minneapolis, MN).
11/14/2012-10/31/2016	NIH Phase II SBIR grant: R44EY021412-02, "Vision Impaired Wayfinding with Doppler Velocimeter" ($49,009 / $1,473,275), researching new hardware and user interfaces supporting accessible indoor navigation (N.A. Giudice, UMaine PI; with Koronis Biomedical Technologies, PI, Minneapolis, MN).
2012	R&D contract 2907-01 ($78,730), "Using augmented and virtual reality for indoor visualization on mobile devices" (N.A. Giudice (UMaine PI); with R.R. Corey (Co-PI); Majella Global Technologies (PI), Portland, ME).

10/01/2011-09/31/2014 NIDRR Phase II SBIR grant: H133S100049, "Indoor Route Following Tool for the Blind" ($46,640 / $75,000), researching accessible indoor navigation systems (N.A. Giudice, UMaine PI; with Koronis Biomedical Technologies, PI, Minneapolis, MN).

07/01/2009-06/30/2012 NIH Phase II SBIR grant: EY017228-02A2, "Indoor Personal Navigation System for the Blind using Augmented GPS" ($40,451 / $433,158), researching accessible indoor GPS technology (N.A. Giudice, UMaine PI; with Koronis Biomedical Technologies, PI, Minneapolis, MN).

4.3 University of Maine (UMaine) and other Internal Grants (22) ($568,489 / $632,816):

2025-2026 Advanced Research Learning Experience award for developing a Human-Centered Technology and Design course in VEMI. $5000 (PI: J.S. Riccardi, with Co-PIs: N.A. Giudice, R.R. Corey, and F. Ahmed).

2024-2025 ASCC/TIDC and Maine DOT project "Augmented Information in the Driving Environment" ($150,000). Increasing independence and safe vehicle operation for older adults by improving access to environmental information through compensatory augmentations while driving (PI: N.A. Giudice; Co-PIs: R.R. Corey and P.D.S. Fink (UMaine)).

2020-2021 UMaine and Northeastern AI Seed grant "Combining Real-Time Deep Learning and Human-Vehicle Collaboration Techniques in Autonomous Vehicles to Assist Older and Visually Impaired Passengers" ($25,000 / $50,000). Studying uses of ML to support accessible human-vehicle interactions in AVs (PI: N.A. Giudice; Co-PIs: R.R. Corey (UMaine); & X. Lin (Northeastern).

2020-2021 UMaine AI Seed grant "Improved Adversarial Attack Detection Toward Robustness of Deep Neural Networks." ($17,160 / $56,487). Studying AML in context of AVs (PI: S.Y. Sekeh; Co-PIs: N.A. Giudice, R.R. Corey, A. Abedi (UMaine), T. Nowak (Pacific Northwest National Laboratory).

2018-2019 UMaine RRF seed Grant "Gaming Application for Multimodal Skill Acquisition (GAMSA): Improving Navigation and Independence for Blind and Visually Impaired People" ($65,000), developing a new gamification O&M training tool (N.A. Giudice (PI), with Rabih Dow, The Iris Network, Portland ME (Co-PI)).

2018-2019 UMaine RRF seed Grant "Augmented reality respiratory simulators for combined visual and haptic medical training in low-resource settings" ($80,000), developing a low cost, highly effective multimodal medical tool. (N.A. Giudice (Co-PI), with C. Howell (PI)).

2017-2018 UMaine Aging Prototype Proposal "Commercializing Smart Shoe and Smart Cane" ($22,998), developing medical technology for older adults (N.A. Giudice, Co-pi; with A. Abedi (PI)).

2017-2018 UMaine Aging Prototype Proposal "Compensatory Augmentations for Assistive Technology to Commercialize Safe and Efficient Navigation" ($20,000), developing navigation assistance software (N.A. Giudice, Co-pi; with R.R. Corey (PI)).

2017-2018 UMaine Aging Prototype Proposal "Indoor Navigation for Older Adults" ($20,000), developing indoor navigation technology (N.A. Giudice, PI; with R.R. Corey and A. Abedi).

2015-2016 UMaine Aging Research and Technology Seed Grant "Improving navigation and independence in older adults using compensatory augmentations" ($38,000),

studying new technology to improve safe and efficient driving and navigation for people over 65 (N.A. Giudice, pi; with R.R. Corey).

2015-2016 UMaine Aging Research and Technology Seed Grant "Indoor multi-input navigation for the aging population using a hybrid wireless system (iMAP)" ($44,000), studying low-cost methods for indoor localization and navigation for older adults (N.A. Giudice, Co-pi; with A. Abedi (PI) and R.R. Corey).

2014-2015 Sustainability Solution Initiative Seed grant "Using Immersive Virtual Reality to Understand the Impacts of Wind Energy Siting" ($58,455), creating 3D VR/AR simulations of new windfarms (N.A. Giudice, PI; with Mario Teisl; Shannon McCoy; and Caroline Noblet).

2011-2012 Temple University Replication Grant ($600), ensuring higher educational opportunity for all UMaine students (N.A. Giudice, collaborator).

2010 UMaine Faculty Research Award 5252980-13 ($12,276), for purchasing augmented reality hardware (N.A. Giudice, PI).

2008 UCSB Brain Imaging Center ($10,000), seed funding for neuroimaging Parahippocampal Place Area (PPA) fMRI project (N.A. Giudice, Co-PI; with J.M. Loomis, PI; and T. Wolbers).

2002-2007 Multi-institution NIDRR grant H133A011903, researching indoor/outdoor wayfinding technologies for the blind (Grad Research Assistant and Collaborator).

2002-2003 NIH grant F32-EY015963-01 (Grad Research Assistant).

2002 Center for Cognitive Sciences Mini-Research Grant (Graduate Trainee).

2001-2004 Visual Neuroscience Training Grant 5T32-EY07133 (Grad Research Assistant).

2001 NIH Center for Cognitive Sciences Fellowship T32-HD07151 (Graduate Trainee).

1998-2000 NSF Vision and Motor Control Fellowship GER-9454163 (Graduate Training).

1998 UMN Graduate School Fellowship (Graduate Trainee).

4.4 Project Supplements and Consulting Contracts (12) ($271,581):

2022-2025 REU supplement to NSF HCC-IIS2106393: "Investigating Inclusive Data Science Tools to Overcome Statistics Anxiety"; ($48,000). Designing and evaluating the Relatable Online Accessible Data Science (ROADS) platform, a tool to improve online data science understanding / accessibility for college students (N.A. Giudice, UMaine PI).

2020 REU supplement to NSF grant: CHS-1910603, "Improving user trust of autonomous vehicles through human-vehicle collaboration" ($32,000). Development of human-vehicle collaboration profiles to improve user trust, usability, and accessibility of fully autonomous vehicles (N.A. Giudice, PI; with R.R. Corey).

2020 REU supplement to NSF grant: IIS-1822800 "A remote multimodal learning environment to increase graphical information access for blind and visually impaired students" ($16,000) developing an accessible, remotely deployed STEM-learning platform for BVI students (N.A. Giudice, PI).

2019 REU supplement to NSF grant: IIS-1822800 "A remote multimodal learning environment to increase graphical information access for blind and visually impaired students" ($15,360) developing an accessible, remotely deployed STEM-learning platform for BVI students (N.A. Giudice, PI).

2019 REU supplement to NSF grant ECR DCL Level 2 1644471: “Perceptual and Implementation Strategies for Knowledge Acquisition of Digital Tactile Graphics for Blind and Visually Impaired Students” ($7,680), researching touchscreen interfaces for vibro-audio rendering / perception (N.A. Giudice, PI).

2018 REU supplement to NSF grant ECR DCL Level 2 1644471: “Perceptual and Implementation Strategies for Knowledge Acquisition of Digital Tactile Graphics for Blind and Visually Impaired Students” ($7,680), researching touchscreen interfaces for vibro-audio rendering / perception (N.A. Giudice, PI).

2017 REU supplement to NSF grant CHS-#1425337, “Non-visual Access to Graphical Information Using a Vibro-Audio Display” ($15,360), researching digital beacons to support real-time accessible indoor navigation (N.A. Giudice, PI).

2017 REU supplement to NSF grant ECR DCL Level 2 1644471: “Perceptual and Implementation Strategies for Knowledge Acquisition of Digital Tactile Graphics for Blind and Visually Impaired Students” ($7,680), researching touchscreen interfaces for vibro-audio rendering / perception (N.A. Giudice, PI).

2016-2017 NEH Office of Preservation and Access, tier 1 Research and Development grant: “Semantic Annotation Tool”; ($55,000 VEMI consulting project), developing the UI for an open source video annotation tool providing BVI people access to visually-based media clips (R.R. Corey and N.A. Giudice, UMaine consultants; with M. Williams (pi) and J. Bell, Dartmouth).

2015 REU supplement to NSF grant CHS-#1425337, “Non-visual Access to Graphical Information Using a Vibro-Audio Display” ($15,360), researching real-time access to scene elements using touchscreen-based devices (N.A. Giudice, PI).

2013 REU supplement to NSF grant IIS-0916219, “Information Integration and Human Interaction for Indoor and Outdoor Spaces” ($8,560), researching indoor navigation technology (N.A. Giudice, PI).

2009 NSF CDI-0936008 ($42,901), "Cyber Enhancement" technology supplement (N.A. Giudice, PI).

4.5 Awards and Prizes (2) ($600,000):

2022 U.S. DOT Inclusive Design Challenge (IDC) Finalist prize “The Autonomous Vehicle Assistant (AVA): A Complete Trip Solution for Future accessible Mobility”; ($300,000). Designing new multisensory techniques using NL, CV, and ML algorithms for improving access to autonomous ride sharing (N.A. Giudice (PI), with R.R. Corey (UMaine), S.D. Doore (Colby), and X. Lin (Northeastern).

2021 U.S. DOT Inclusive Design Challenge (IDC) Semifinalist prize “Autonomous Vehicle Assistant (Ava): Ride-hailing and localization for the future of accessible mobility”; ($300,000). Designing new multisensory techniques using NL, CV, and ML algorithms for improving access to autonomous ride sharing (N.A. Giudice (PI), with R.R. Corey (UMaine), S.D. Doore (Colby), and X. Lin (Northeastern).

4.6 Student Awards and Competitive Grants / Fellowships (25) ($35,542):

2023-2024 Adam Elkadi, Maine State Grant Consortium (MSGC) Research Experience fellowship “Gauging Human Trust Through the Use of a Multimodal, Omnidirectional, and Immersive Autonomous Vehicle Simulator,” (2000), Evaluating trust in an immersive AV sim and how it can be disrupted and built up based on driving behavior (N.A. Giudice, PI).

2018-2019 Brad Butler, The University of Maine (UMaine) Undergraduate Research and Creative Activity CLAS Fellowship "Applying Observational Virtual Reality to Improve Student Learning of Human Musculature" ($1,100), developing a system to improve visualization of internal muscles and their connectivity (N.A. Giudice, PI).

2017-2018 Gene Herrschaft, UMaine Undergraduate Research and Creative Activity CLAS Fellowship "Facilitating Meaningful Interpersonal Connections Through a Virtual Space" ($1,000), using VR in social contexts. (N.A. Giudice, PI).

2016-2017 Toni Kaplan, UMaine Undergraduate Research and Creative Activity CLAS Fellowship "Development of a Dynamic Multisensory Interface to Provide Accessible Biological Diagrams for Blind and Low Vision Students" ($1,000), haptic-audio smartphone interface supporting STEM education (N.A. Giudice, Pi; with R.R. Corey, Co-PI).

2015-2016 Brenden Peters, UMaine Undergraduate Research and Creative Activity CLAS Fellowship "Dynamic Motion Control: Networked Control Software and Expanded Physical Capabilities for Virtual Environment Motion Feedback Devices" ($900), focusing on development of software for the VEMI Lab's six-degrees-of-freedom motion platform (N.A. Giudice, Pi; with R.R. Corey, Co-PI).

2015-2016 Toni Kaplan, UMaine Undergraduate Research and Creative Activity CLAS Fellowship "Evaluation of Virtual Reality Simulation as a Supplemental Treatment in Cases of Seasonal Affective Disorder" ($900), comparing traditional and VR-based mitigation for SAD (N.A. Giudice, Pi; with R.R. Corey, Co-PI).

2015-2016 Brenden Peters, Maine Space Grant Consortium (MSGC) fellowship "Dynamic Motion Control: Networked Control Software and Expanded Physical Capabilities for Virtual Environment Motion Feedback Devices" ($1,000), focusing on development of software for the VEMI Lab's six-degrees-of-freedom motion platform (N.A. Giudice, Pi; with R.R. Corey, Co-PI).

2015-2016 Scott Richards, UMaine Center for Undergraduate Research fellowship "Virtual Reality Exposure Therapy for Veterans with PTSD" ($1,000), platform for creating situationally-specific simulations for the treatment of PTSD (N.A. Giudice, Pi; with R.R. Corey, Co-PI).

2014-2015 Sam Gates, UMaine Center for Undergraduate Research fellowship "Accelerometer for Fall Detection" ($1,000), technology to prevent falls and support independent living for elders (N.A. Giudice, PI; with R.R. Corey, Co-PI).

2014-2015 Allison Goodridge, UMaine Center for Undergraduate Research (CUGR) Fellowship "Dynamic Motion Control: Generating Physical Phenomena for Examination of Spatial Cognition and Impulse Response in Virtual Environments" ($1,000), to jointly create a 6 DOF motion platform for VR simulations (N.A. Giudice, PI; with R.R. Corey, Co-PI).

2014-2015 Meghan Hurlburt, UMaine Center for Undergraduate Research Fellowship "Using Radio Frequency Indicator Technology as An Inexpensive and Noninvasive Solution for Aging in Place" ($1,000), home-based tracking system for older adults (N.A. Giudice, PI; with R.R. Corey, Co-PI).

2014-2015 Meghan Hurlburt, UMaine Undergraduate Research and Creative Activity CLAS Fellowship "Monitoring Independently Aging Adults with Radio Frequency Indicator Technology: An Inexpensive and Noninvasive Solution for Aging in Place" ($2,167), system for indoor tracking of older adults (N.A. Giudice, PI; with R.R. Corey, Co-PI).

2014-2015 Tim McGrath, UMaine Center for Undergraduate Research Fellowship "Development of a Non-Visual Indoor Navigation Assistive Device Using Real-Time Tracking and

Multimodal Feedback" ($1,000), to create virtual audio models of indoor spaces (N.A. Giudice, PI; with R.R. Corey, Co-PI).

2014-2015 Brenden Peters, UMaine Center for Undergraduate Research Fellowship "A Low-Power Device for Indoor Mapping and Navigation" ($991), RFID-based system for indoor mapping (N.A. Giudice, PI; with R.R. Corey, Co-PI).

2014-2015 Brenden Peters, UMaine Undergraduate Research and Creative Activity CLAS Fellowship "Devices for Indoor Mapping and Augmented Navigation" ($2,416), an indoor navigation device based on automated mapping (N.A. Giudice, PI; with R.R. Corey, Co-PI.

2014-2015 Dustin Sleight, UMaine Center for Undergraduate Research Fellowship "Dynamic Motion Control: Generating Physical Phenomena for Examination of Spatial Cognition and Impulse Response in Virtual Environments" ($1,000), to jointly create a 6 DOF motion platform for VR simulations (N.A. Giudice, PI; with R.R. Corey, Co-PI).

2013-2014 Sylvia Allain, UMaine Center for Undergraduate Research Fellowship "Virtual Modeling of Forest Populations in Maine Given the Introduction of Invasive Plant Species" ($992), virtual simulations of forest competition and growth (N.A. Giudice, PI; with R.R. Corey, Co-PI).

2013-2014 Sylvia Allain, UMaine Undergraduate Research and Creative Activity CLAS Fellowship "Virtual Modeling of Forest Populations in Maine" ($2,050), virtual simulations of forest ecosystems (N.A. Giudice, PI; with R.R. Corey, Co-PI).

2013-2014 Jon Cole, UMaine Center for Undergraduate Research Fellowship "Virtual Simulations of Compensatory Techniques for Age-Related Vision Loss" ($2,946), testing compensatory augmentations to assist driving in older adults (N.A. Giudice, PI; with R.R. Corey, Co-PI).

2013-2014 Tim McGrath, UMaine Center for Undergraduate Research Fellowship "Non-Visual Indoor Navigation Using Three Dimensional Auditory Displays and Sensory Feedback from Mobile Devices" ($983), smartphone interface to support accessible indoor navigation (N.A. Giudice, PI; with R.R. Corey, Co-PI).

2013-2014 Dustin Sleight, UMaine Center for Undergraduate Research Fellowship "A Study in Site-Specific Access to Multimodal Interfaces for Geospatial Navigation" ($956), multimodal interfaces for real-time navigation (N.A. Giudice, PI; R.R. Corey, Co-PI).

2013-2014 Dustin Sleight, UMaine Undergraduate Research and Creative Activity CLAS Fellowship "Mobile mapping applications: Access to Multimodal Interfaces for Geospatial Navigation" ($641), real-time campus map for navigation and accessibility (N.A. Giudice, PI; with R.R. Corey, Co-PI).

2012-2013 Jon Cole, UMaine Center for Undergraduate Research Fellowship "Virtual Simulations of Compensatory Techniques for Age-Related Vision Loss" ($2,500), virtual augmentations to assist driving in older adults (N.A. Giudice, PI; R.R. Corey, Co-PI).

2011-2012 Jon Cole, UMaine Undergraduate Research and Creative Activity CLAS Fellowship "Virtual simulations of age-related visual impairment" ($2,500), simulating common forms of visual impairment (N.A. Giudice, PI; with R.R. Corey, Co-PI).

2011-2012 Josh Leger, UMaine Undergraduate Research and Creative Activity CLAS Fellowship "Visual Augmentation for Aging and Navigation" ($2,500), using AR to reduce falling in older adults (N.A. Giudice, PI; with R.R. Corey, Co-PI).

4.7 VEMI Gifts and Charitable Giving ($43,505):

2021	$3,560
2020	$15,060
2019	$14,525
2018	$5,500
2017	$2900
2016	$660
2015	$300
2014	$1000

5. ACADEMIC PRODUCTS / PUBLICATIONS (234)

VEMI Lab pubs: https://umaine.edu/vemi/publications/
Google Scholar Index: http://scholar.google.com/citations?user=jD95I7EAAAAJ

[Student co-authors denoted by *italics*]

Summary Metrics: 234 products, including:

- *55 peer-reviewed journal articles / book chapters, 4 essay's, 1 policy/technical brief, 6 edited books / technical reports, 34 fully refereed conference proceedings, 117 conference presentations, and 17 theses (as 1st advisor).*
- *159 national / international collaborators; with N.A. Giudice lead or senior / corresponding author on ~80% of all products.*
- *16 student research excellence awards*
- *53 student co-authors, with ~55% student led publications and ~70% of all products include student collaboration.*

5.1 Peer-Reviewed Journal Articles (45):

- Fink, P.D.S., Brown, J.R., *Kutzer, K.M.,* & Giudice, N.A. (in press). Does Trust Even Matter? Behavioral Evidence for the Disconnect Between People's Subjective Trust and Decisions to Use Autonomous Vehicles. Transportation Research Part F: Traffic Psychology and Behaviour. DOI: 10.1016/j.trf.2025.05.024 (Corresponding author).
- Doore, S.A., Brown, J.R., Imai, S., Dimmel, J.K. & Giudice, N.A. (2024). Non-visual interfaces for visual learners: Multisensory learning of graphic primitives. IEEE Access. 12, 189926-189940. DOI: 10.1109/ACCESS.2024.3513712.
- Doore, S.A., *Istrati, D. Xu*, C., *Qiu, Y., Sarrazin, A.,* & Giudice, N.A. (2024). Images, Words, and Imagination: Accessible Descriptions to Support Blind and Low Vision Art Exploration and Engagement. *Journal of Imaging* 10, 1:26. DOI: 10.3390/jimaging10010026 PMCID: PMC10817527
- Tennison, J.L., *Goswami, S*., *Hairston, J.R*., Uesbeck, P.M., Smith, D.W., Giudice, N.A., Stefik, A., & Gorlewicz, J.L. (2024). Bridging the Gap of Graphical Information Accessibility in Education with Multimodal Touchscreens Among Students with Blindness and Low Vision. Journal of Visual Impairment and Blindness, *117*(6), 453-466. DOI: 10.1177/0145482X23121749
- Fink, P.D S., *Alsamsam, M., Brown, J. R., Kindler, H.D.,* & Giudice, N.A. (2023). Give us something to chauffeur it: Exploring user needs in traditional and fully autonomous ridesharing for people who are blind or visually impaired. Transportation Research Part F: Psychology and Behaviour, 98,91-103. DOI: 10.1016/j.trf.2023.09.004 (corresponding author).
- *Fink, P.D.S.,* Doore, S.A., Lin, X., *Maring, M.,* Zhao, P., *Nygaard, A*., Beals, G., Corey, R.R., Perry, R.J., Freund, K., Dimitrov, V., Giudice, N.A. (2023). The Autonomous Vehicle Assistant (AVA): Emerging Technology Design Supporting Blind and Visually Impaired Travelers in

Autonomous Transportation. *International Journal of Human - Computer Studies, 179.* DOI: 10.1016/j.ijhcs.2023.103125 (corresponding author).

- *Trinh, V.*, Manduchi, R., & Giudice, N.A. (2023). Experimental Evaluation of Multi-Scale Tactile Maps Created with SIM, a Web App for Indoor Map Authoring. *ACM Transactions on Accessible Computing*, 16(2), 1-26. DOI: 10.1145/3590775 PMCID: PMC10327626.
- Doore, S.A., Dimmel, J., *Kaplan, T.M.,* Guenther, B.A., & Giudice, N.A. (2023). Multimodality as Universality: Designing inclusive accessibility to graphical information. Frontiers in Education, vol 8, p. 92. DOI: 10.3389/feduc.2023.1071759 (corresponding author).
- Ruginski, I.T., Giudice, N.A., Creem-Regehr, S.H., & Ishikawa, T. (2022). Designing mobile spatial navigation systems from an interdisciplinary perspective: An interdisciplinary review. Spatial Cognition & Computation, 22(1-2), 1-29. DOI: 10.1080/13875868.2022.2053382
- Palani, H.P., *Fink, P.D.S.,* & Giudice, N.A. (2021). Comparing Map Learning between Touchscreen-Based Visual and Haptic Displays: A Behavioral Evaluation with Blind and Sighted Users. Multimodal Technologies and Interaction, 6(1):1. DOI: 10.3390/mti6010001 (corresponding author).
- *Fink, P.D.S., Holz, J.A.,* & Giudice, N.A. (2021). Fully autonomous vehicles for people with visual impairment: Policy, accessibility, and future directions. ACM Transactions on Accessible Computing (TACCESS) 14, 3, Article 15 (17 pages). DOI: 10.1145/3471934 (corresponding author).
- Herbert, V.M., Perry, R.J., *LeBlanc, C.*, Haase, K.N., Corey, R.R., Giudice, N.A., and Howell, C.L. (2021). Developing a smartphone app with augmented reality to support virtual learning of nursing students on heart failure. Clinical Simulation in Nursing. 54 (2021), 77-85. DOI: 10.1016/j.ecns.2021.02.003
- Rizzo, J.R.*, Beheshti, M., Fang, Y., Flanagan, S., & Giudice, N.A.* (2021). COVID-19 and Visual Disability: Can't Look and Now Don't Touch. Physical medicine & rehabilitation. (PM&R), 13(2021), 415-421. DOI: 10.1002/pmrj.12541 PMID: 33354903 (*Equal contribution of authors).
- Giudice, N.A., Guenther, B.A., *Kaplan, T.M.*, Anderson, S.M., Knuesel, R.J., & Cioffi, J.F. (2020). Use of an Indoor navigation system by sighted and blind travelers: Performance Similarities across visual status and age. ACM Transactions on Accessible Computing (TACCESS), 13(3), Article 11 (27 pages). DOI: 10.1145/3407191 (corresponding author)
- Gorlewicz, J.L., *Tennison, J.L.*, *Uesbeck, P.M.*, Richard, M.E., Palani, H.P., Stefik, A., Smith, D.W., & Giudice, N.A. (2020). Design Guidelines and Recommendations for Multimodal, Touchscreen-Based Graphics. ACM Transactions on Accessible Computing (TACCESS), 13(3), Article 10 (30 pages). DOI: 10.1145/3403933
- *Tennison, J.L., Uesbeck, P.M.*, Giudice, N.A., Stefik, A., Smith, D.W., & Gorlewicz, J.L. (2020). Establishing Vibration-based Tactile Line Profiles for Use in Multimodal Graphics. Transactions on Applied Perception, 17(2), 1-14. DOI: 10.1145/3383457
- Palani, H.P., *Fink, P.D.*S, & Giudice, N.A. (2020). Design Guidelines for Schematizing and Rendering Haptically Perceivable Graphical Elements on Touchscreen Devices. *International Journal of Human-Computer Interaction*, 1-22. DOI: 10.1080/10447318.2020.1752464 (corresponding author).
- Giudice, N.A., Guenther, B.A., *Jensen, N.A.*, & *Haase, K.N*. (2020). Cognitive mapping without vision: Comparing wayfinding performance after learning from digital touchscreen-based multimodal maps vs. embossed tactile overlays. Frontiers in Human Neuroscience. 14:87. DOI: 10.3389/fnhum.2020.00087 PMCID: PMC7090157 (corresponding author).

- Giudice, N.A., Whalen, W.E., Riehle, T.H., Anderson, S.M., and *Doore, S.A.* (2019). Evaluation of an accessible, real-time, and infrastructure-free indoor navigation system by blind users in the Mall of America. *Journal of Visual Impairment and Blindness, 113*(2), 140-155. DOI: 10.1177/0145482X19840918. (corresponding author).
- Teisl, M.F., Noblet, C.L., Corey, R.R., and Giudice, N.A. (2018). Seeing clearly in a virtual reality: Tourist reactions to an offshore wind project. *Energy policy, 122*(2018), 601-611. DOI: 10.1016/j.enpol.2018.08.018
- *Tennison, J.L.*, Carril, Z.S., Giudice, N.A., and Gorlewicz, J.L. (2018). Comparing Haptic Pattern Matching on Tablets and Phones: Large Screens are Not Necessarily Better. *Optometry and Vision Science, 95*(9), 720-726. DOI: 10.1097/OPX.0000000000001274 PMID: 30169351.
- *Li, H.* and Giudice, N.A. (2018) Assessment of between-floor structural and topological properties on cognitive map development in multi-level built environments. *Spatial Cognition & Computation, 18*(3), 138-172. DOI: 10.1080/13875868.2017.1384829 (corresponding author).
- *Bennett, C.R.*, Klatzky, R.L., Loomis, J.M., and Giudice, N.A. (2017). Spatial Updating of Multiple Targets: Comparison of younger and older adults. *Memory and Cognition, 45*(7), 1240-1251. DOI: 10.3758/s13421-017-0725-0 PMCID: PMC5711592 (corresponding author).
- Giudice, N.A., *Bennett, C.R.*, Klatzky, R.L., and Loomis, J.M. (2017). Spatial Updating of haptic arrays across the lifespan. *Experimental Aging Research, 43*(3), 274-290. DOI: 10.1080/0361073X.2017.1298958 PMID: 28358297 (corresponding author).
- *Palani, H.P.* and Giudice, N.A. (2017). Principles for designing large-format refreshable haptic graphics using touchscreen devices: An evaluation of nonvisual panning methods. *ACM Transactions on accessible Computing (TACCESS), 9*(3). Article 9 (25 pages). DOI: 10.1145/3035537 (corresponding author).
- Gies, T., Boucherie, S., Narup, T., Wise, A., & Giudice, N.A. (2016). What goes unseen in accessible publishing: Good practice and remaining gaps. *Journal of European Science Editing, 42*(3), 66-69. DOI: 10.20316/ESE.2016.42.015
- Gershon, P., Klatzky, R. L., *Palani, H.,* & Giudice, N.A. (2016). Visual, tangible, and touch-screen: Comparison of platforms for displaying simple graphics. *Assistive Technology, 28*(1), 1-6. DOI: 10.1080/10400435.2015.1054566 PMID:26953681.
- O'Modhrain, S., Giudice, N.A., Gardner, J.A., & Legge, G.E. (2015). Designing media for visually-impaired users of refreshable touch displays: Possibilities and pitfalls. *Transactions on Haptics, 8*(3), 248-257. DOI: 10.1109/TOH.2015.2466231 PMID: 26276998
- Pawluk, D.T., Bourbakis, N., Giudice, N.A., Hayward, V., & Heller, M. (2015). Guest Editorial: Haptic assistive technology for individuals who are visually impaired. *Transactions on Haptics, 8*(3), 245-247. DOI: 10.1109/TOH.2015.2476735 PMID: 26649374
- Klatzky, R.L., Giudice, N.A., *Bennett, C.R.*, & Loomis, J.M. (2014). Touch-screen technology for the dynamic display of 2D spatial information without vision: Promise and progress. *Multisensory Research, 27*(5-6), 359-378. DOI: 10.1163/22134808-00002447 PMID: 25693301
- Klatzky, R.L. & Giudice, N.A. (2013). The planar mosaic fails to account for spatially directed action. *Behavioral and Brain Sciences (commentary), 36*(5), 554-555. DOI: 10.1017/S0140525X13000435 PMID: 24103608.
- Nossum, A.S., Giudice, N.A., & *Li, H.* (2013). Vertical color maps: A data independent alternative to floor plan maps. *Cartographica, 48*(3), 225-236. DOI: 10.3138/carto.48.3.1641 (corresponding author).

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- Giudice, N.A., Klatzky, R.L., *Bennett, C.R.,* & Loomis, J.M. (2013). Perception of 3-D location based on vision, touch, and extended touch. *Experimental Brain Research, 224*(1), 141-153. DOI: 10.1007/s00221-012-3295-1 PMCID: PMC3536915 (corresponding author).
- Loomis, J.M., Klatzky, R.L., McHugh, B., & Giudice, N.A. (2012). Spatial working memory for locations specified by vision and audition: Testing the amodality hypothesis. *Attention, Perception, & Psychophysics,74*(6), 1260-1267. DOI: 10.3758/s13414-012-0311-2 PMCID: PMC3482114
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- Wolbers, T.*, Loomis, J.M., Klatzky, R.L., Wutte, M., & Giudice, N.A.* (2011). Modality independent coding of spatial layout in the human brain. *Current Biology, 21*(11), 984-989. DOI: 10.1016/j.cub.2011.04.038 PMCID: PMC3119034 (*Equal contribution of authors & corresponding author).
- Giudice, N.A., *Betty, M.R.,* & Loomis, J.M. (2011). Functional equivalence of spatial images from touch and vision: evidence from spatial updating in blind and sighted individuals. *Journal of Experimental Psychology: Learning, Memory, & Cognition, 37*(3), 621-634. DOI: 10.1037/a0022331 PMCID: PMC5507195 (corresponding author).
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- Giudice, N.A., Klatzky, R.L., & Loomis, J.M. (2009). Evidence for amodal representations after bimodal learning: Integration of haptic-visual layouts into a common spatial image. *Spatial Cognition & Computation, 9*(4), 287-304. DOI: 10.1080/13875860903305664 (corresponding author).
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5.2 Personal Essays, Op-Eds, and Perspectives (4):

- Giudice, N.A. (2022). One vote for me, many votes for Mainekind. Medium.
- *Fink, P.D.S.,* & Giudice, N.A. (2022). Disability rights advocates improved remote voting for all. Bangor Daily News. Op-Ed.
- Giudice, N.A. (2020). 08–07–1997: The day I almost died and related tales. Medium.
- Giudice, N.A. (2020). COVID-19 and blindness: Why the new touchless, physically-distant world sucks for people with visual impairment. Medium.

5.3 Policy and Technical Briefs (1):

- *Fink, P.D.S.* & Giudice, N.A. (2021). Federal Accessibility Standards for Fully Autonomous Vehicles. Policy Brief for the Day-One science and technology policy accelerator*, Federation of American Scientists, IT & Technology Policy.*

5.4 Book Chapters (7):

- Giudice, N.A. & Long, R.G. (2024). Establishing and maintaining orientation: Tools, techniques, and technologies. In R.S. Wall Emerson, B.B. Blasch, & W.R. Wiener (Eds.), Foundations of orientation and mobility: Vol. I, History and theory (4th ed., pp. 18-54). APH Press. (corresponding author).
- Gorlewicz, J.L., *Tennison, J.L.,* Palani, H.P., & Giudice, N.A. (2018). The Graphical Access Challenge for People with Visual Impairments: Positions and Pathways Forward. In D. Cvetkovic (ed), Interactive Multimedia - Multimedia Production and Digital Storytelling (pp. 109-125). IntechOpen. DOI: 10.5772/intechopen.82289. (corresponding author).
- Giudice, N.A. (2018). Navigating without vision: Principles of Blind Spatial Cognition. In D.R. Montello (ed.), *Handbook of Behavioral and Cognitive Geography*: Edward Elgar Publishing. Chapter 15, (pp. 260-288). Cheltenham, UK; Northampton, MA. DOI:10.4337/9781784717544.00024 (corresponding author).
- Loomis, J.M., Klatzky, R.L., & Giudice, N.A. (2013). Representing 3D Space in working memory: Spatial images from vision, hearing, touch, and language. In S. Lacey & R. Lawson (Eds). *Multisensory Imagery: Theory & Applications* (pp. 131-156). New York: Springer. DOI: 10.1007/978-1-4614-5879-1_8
- Loomis, J.M., Klatzky, R.L., & Giudice, N.A. (2012). Sensory substitution of vision: Importance of perceptual and cognitive processing. In R. Manduchi & S. Kurniawan (Eds). *Assistive Technology for Blindness and Low Vision* (pp. 162-191). Boca Raton, FL: CRC Press.
- Long, R.G.*, & Giudice, N.A.* (2010). Establishing and maintaining orientation for orientation and mobility. In B.B. Blasch, W.R. Wiener, & R.W. Welsh (Eds.), *Foundations of Orientation and Mobility 3rd Edition* (Vol. 1, pp. 45-62). New York: American Foundation for the Blind (*equal contribution of authors & corresponding author).
- Giudice, N.A., & Legge, G.E. (2008). Blind navigation and the role of technology. In A. Helal, M. Mokhtari, & B. Abdulrazak (Eds.), *Engineering Handbook of Smart Technology for Aging, Disability, and Independence* (pp. 479-500): John Wiley & Sons (corresponding author).

5.5 Books and Edited Volumes (2):

- *C. Graf,* N.A. Giudice, & F. Schmid (Eds.) (2012). Proceedings of the international workshop on spatial knowledge acquisition with limited information displays (SKALID'12), Vol. 888. urn:nbn:de:0074-888-1

- M.J. Egenhofer, N.A. Giudice, R. Moratz and M.F. Worboys (Eds.) (2011). Spatial information theory: Proceedings of COSIT '11. Lecture Notes in Computer Science. Vol. 6899. Springer, Berlin. ISBN: 978-3-642-23195-7

5.6 Technical Reports (4):

- *Cole, J.D., Perry, R.J., Kaplan, T.M., Palani, H.P.,* and Giudice, N.A. (2017). VEMI Lab Technical Evaluation #0717: Status of the Navatar project. Conducted by VEMI lab on behalf of the Reader's Digest Partners for Sight Foundation.
- Legge, G.E., Downey, C., Giudice, N.A. & Tjan, B.S. (2016). Indoor Airport Wayfinding for Blind and Visually Impaired Travelers. Report to the Federal Aviation Administration, No. DOT/Faa/TC-TN16/54.
- Noblet, C., Teisl, M.F., Kashkooli, M., Teisl, B., Corey, R.R., & Giudice, N.A. (2016). Potential tourism impacts of an offshore wind farm near Monhegan island. Technical Report for the University of Maine's School of Economics and the Senator George J. Mitchell Center for Sustainability Solutions (corresponding author)
- Moratz, R. & Giudice, N.A. (Eds.) (2011). Extended poster abstracts from the conference on spatial information theory (COSIT 2011). Belfast, ME.

5.7 Fully Refereed Conference Proceedings (35):

Conference papers with external review and full manuscript appearing in a published proceeding

- Duerstock, B., Giudice, N.A., Klinich, K., Kreschmer, J., Lee, M., Bond, J. (2025). Towards a Cohesive Accessible Mobility Ecosystem. To appear in the Proceedings of the Human Factors and Ergonomics Society Annual Meeting
- Fink, P.D.S., *Milne, H., Caccese, A., Alsamsam, M., Loranger, J., Colley, M.,* & Giudice, N.A. (2024). Accessible maps for the future of inclusive ridesharing. In the Proceedings of the 16th International Conference on Automotive User Interfaces and Interactive Vehicular Applications (AutomotiveUI '24), 106-115. https://doi.org/10.1145/3640792.3675736 (corresponding author). Acceptance rate: 44%
- Bennett, C.R., Fink, P.D.S., & Giudice, N.A. (2024). X-ray vision as a compensatory augmentation for slowing cognitive map decay in older adults. Proceedings of the 2024 CHI Conference on Human Factors in Computing Systems (CHI '24). DOI: 10.1145/3613904.3642644. (corresponding author). Acceptance rate: 26.4%
- Robinson-Moore, W. Kalal, M., Tennison, J.L., Giudice, N.A., & Gorlewicz, J.L. (2024). Spatial audio-enhanced multimodal graph rendering for efficient data trend learning on touchscreen devices. Proceedings of the 2024 CHI Conference on Human Factors in Computing Systems (CHI '24). DOI: 10.1145/3613904.3641959. Acceptance rate: 26.4%
- Hwang, H., Jung, H., Giudice, N.A., Biswas, J., Lee, S.I., & Kim, D. (2024). Towards robotic companions: Understanding handler-guide dog interactions for informed guide dog robot design. Proceedings of the 2024 CHI Conference on Human Factors in Computing Systems (CHI '24). DOI: 10.1145/3613904.3642181. Acceptance rate: 26.4%
- Brown, J.R., Doore, S.A., Dimmel, J.K., Giudice, N., & Giudice, N.A. (2023). Comparing Natural Language and Vibro-Audio Modalities for Inclusive STEM Learning with Blind and Low Vision Users. In the proceedings of the 25th International ACM SIGACCESS Conference on Computers and Accessibility (ASSETS '23), October 22-25, 2023, 24 Pages. ACM, New York, NY, USA. DOI: 10.1145/3597638.3608429 (corresponding author).

- *Loranger, J.A., Brown, J.R., Kindler, H.D., Fink, P.D.S*., Dimitrov, V., & Giudice, N.A. (2023). The Design of mid-air ultrasonic haptic interfaces based on the perception of lines. In: I.L. Nunes (ed) Human Factors and Systems Interaction. Proceedings of the International Conference on Applied Human Factors and Ergonomics (AHFE'23). vol 84, 18-26. AHFE International, USA. DOI: 10.54941/ahfe1003586 (corresponding author).
- *Alsamsam, M., Fink, P.D.S., Brown, J.R.,* Dimitrov, V., & Giudice, N.A. (2023). Does it press? Investigating the efficacy of an ultrasonic haptic button interface for non-visual driving applications. In: G. Praetorius, C. Sellberg, & R. Patriarca (eds) Human Factors in Transportation. Proceedings of the International Conference on Applied Human Factors and Ergonomics (AHFE'23). vol 95, 343-353. AHFE International, USA. DOI:10.54941/ahfe1003819 (corresponding author).
- *Fink, P.D.S*., *Allaban, A.A*., *Atekha, O*., Perry, R.J., Sumner, E.S., Corey, R.R., Dimitrov, V., & Giudice, N.A. (2023). Expanded Situational Awareness Without Vision: A Novel Haptic Interface for Use in Fully Autonomous Vehicles. Proceedings of the 2023 ACM/IEEE International Conference on Human-Robot Interaction (HRI '23) (pp. 54-62). DOI: 10.1145/3568162.3576975. (corresponding author). Acceptance rate 25.2%.
- *Fink, P.D.S*., Dimitrov, V., Yasuda, H., Chen, T.L., Corey, R.R., Giudice, N.A., Sumner, E.S. (2023). Autonomous is Not Enough: Designing Multisensory Mid-Air Gestures for Vehicle Interactions Among People with Visual Impairments. Proceedings of the 2023 CHI Conference on Human Factors in Computing Systems (CHI '23). DOI: 10.1145/3544548.3580762. (Acceptance rate 28.39%).
- Doore, S.A., Dimmel, J.K., *Xi, R.,* & Giudice, N.A. (2021). Embedding expert knowledge: a case study on developing an accessible diagrammatic interface. In D. Olanoff, K. Johnson, & S. Spitzer (Eds.), Proceedings of the forty-third annual meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education (pp. 1759 – 1763). Philadelphia, PA.
- Doore, S.A., *Sarrazin, A.C*., and Giudice, N.A. (2019). Natural-Language Scene Descriptions for Accessible Non-Visual Museum Exhibit Exploration and Engagement. Stock, K., Jones, C., & Tenbrink, T. (Eds.) In the Proceedings of Workshops and Posters at the 14th International Conference on Spatial Information Theory (COSIT 2019). Regensburg, Germany, Springer International Publishing, (Pp. 91-100).
- *Palani, H.P*., *Tennison, J.L*., Giudice, G.B., & Giudice, N.A. (2018). Touchscreen-based haptic information access for assisting blind and visually-impaired users: Perceptual parameters and design guidelines. In: Ahram T., Falcão C. (eds.) Advances in Usability, User Experience and Assistive Technology, part of the International Conference on Applied Human Factors and Ergonomics (AHFE'18). Advances in Intelligent Systems and Computing, vol 798, (Pp. 837-847). Springer, Cham. DOI: 10.1007/978-3-319-94947-5_82
- *Palani, H.P.,* Giudice, G.B., and Giudice, N.A. (2018). Haptic Information Access using Touchscreen devices: Design Guidelines for Accurate Perception of Angular Magnitude and Line Orientation. In: Antona, M., Stephanidis, C. (eds) Universal Access in Human-Computer Interaction. Methods, Technologies, and Users. UAHCI 2018. Lecture Notes in Computer Science, vol 10907. Springer, Cham. DOI: 10.1007/978-3-319-92049-8_18 (corresponding author).
- *Doore, S.A.*, Beard, K., and Giudice, N.A. (2018). Spatial prepositions in natural-language descriptions of indoor scenes. In P Fogliaroni, A Ballatore and E Clementini (eds.) Proceedings of the 13th International Conference on Spatial Information Theory (COSIT'17). Lecture Notes in Geoinformation and Cartography. Springer, Cham. DOI: 10.1007/978-3-319-63946-8_41

- *Bennett, C.R*. and Giudice, N.A. (2017). Evaluating age-related cognitive Map decay using a Novel time-delayed testing paradigm. In: Barkowsky, T., Burte, H., Hölscher, C., & Schultheis, H. (Eds.). Spatial Cognition X. Lecture Notes in Computer Science, vol. 10523. Springer, Cham. DOI: 10.1007/978-3-319-68189-4_5 (corresponding author) (Acceptance Rate 55%).
- *Bennett, C.R*., Corey, R.R., Giudice, U., and Giudice, N.A. (2016). Immersive virtual reality simulation as a tool for aging and driving research. In J. Zhou & G. Salvendy (Eds.), Human Aspects of IT for the Aged Population. Healthy and Active Aging. ITAP 2016. Lecture Notes in Computer Science, vol 9755. Springer, Cham. DOI: 10.1007/978-3-319-39949-2_36 (corresponding author).
- *Palani, H.P*., Giudice, U., and Giudice, N.A. (2016). Evaluation of non-visual zooming operations on touchscreen devices. In M. Antona & C. Stephanidis (Eds.), Universal Access in Human-Computer Interaction. Interaction Techniques and Environments. UAHCI 2016. Lecture Notes in Computer Science, vol 9738. Springer, Cham. DOI: 10.1007/978-3-319-40244-4_16 (corresponding author).
- *Li, H.,* Corey, R.R., Giudice, U. Giudice, and Giudice, N.A. (2016). Assessment of visualization interfaces for assisting the development of multi-level cognitive maps. In D.D. Schmorrow & M.C. Fidopiastis (Eds.), Foundations of Augmented Cognition: Neuroergonomics and Operational Neuroscience. AC 2016. Lecture Notes in Computer Science, vol 9744. Springer, Cham. DOI: 10.1007/978-3-319-39952-2_30 (corresponding author).
- Fusco, G., Tekin, E., Giudice, N.A. and Coughlan, J.M. (2015). Appliance displays: Accessibility challenges and proposed solutions. In *Proceedings of the 17th International ACM SIGACCESS Conference on Computers and Accessibility* (ASSETS 2015). (pp. 405-406). PMCID: PMC4725718 (Acceptance Rate 24%).
- *Palani, H*. & Giudice, N.A. (2014). Evaluation of non-visual panning operations using touch-screen devices. In *Proceedings of the 16th international ACM SIGACCESS Conference on Computers & Accessibility* (ASSETS'14). (pp. 293-294). DOI: 10.1145/2661334.2661336 (corresponding author, Acceptance Rate 27%).
- *Li, H.* & Giudice, N.A. (2013). The effects of 2D and 3D maps on learning virtual multi- level indoor environments. In *Proceedings of the 1st ACM SIGSPATIAL International Workshop on Map Interaction* (MapInteract'13). (pp. 7–12). DOI: 10.1145/2534931.2534941 (corresponding author).
- *Li, H*. & Giudice, N.A. (2013). The effects of immersion and body-based rotation on learning multi-level indoor virtual environments. Proceedings of the 5th ACM SIGSPATIAL International Workshop on Indoor Spatial Awareness (ISA 2013). (pp. 8-15). DOI:10.1145/2533810.2533811 (corresponding author), Acceptance Rate 71%).
- Riehle, T.H., Anderson, S.M., Lichter, P.A., Whalen, W.E., & Giudice, N.A. (2013). Indoor inertial waypoint navigation for the blind. Proceedings of the *35th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC)* (pp. 5187-5190). DOI: 10.1109/EMBC.2013.6610717 PMID: 24110904
- *Kesavan, S.* & Giudice, N.A. (2012). Indoor scene knowledge acquisition using a natural language interface. In C. Graf, N.A. Giudice, & F. Schmid (Eds.) *Proceedings of the international Workshop on Spatial Knowledge Acquisition with Limited Information Displays* (SKALID'12). (pp. 1-6). August, Monastery Seeon, Germany. (corresponding author).
- *Li, H*. & Giudice, N.A. (2012). Using mobile 3D visualization techniques to facilitate multi-level cognitive map development of complex indoor spaces. In C. Graf, N.A. Giudice, & F. Schmid (Eds.) *Proceedings of the International Workshop on Spatial Knowledge Acquisition with Limited*

Information Displays (SKALID'12). (pp. 31-36). August, Monastery Seeon, Germany. (corresponding author).

- Giudice, N.A., *Palani, H.,* Brenner, E., & Kramer, K.M., (2012). Learning non-visual graphical information using a touch-based vibro-audio interface. In *Proceedings of the 14th International ACM SIGACCESS Conference on Computers and Accessibility* (Assets'12). (pp. 103-110). DOI: 10.1145/2384916.2384935 (corresponding author).
- Riehle, T.H., Anderson, S.M., Lichter, P.A., Giudice, N.A., Sheikh, S.I., Knuesel, R. J., & Kollmann, D.T. (2012). Indoor magnetic navigation for the blind. In *Proceedings of the 34th annual IEEE Engineering in Medicine and Biology Conference* (EMBC'12), (pp. 1972-1975). DOI: 10.1109/EMBC.2012.6346342 PMID: 23366303
- Giudice, N.A., & *Li, H.* (2012). The effects of visual granularity on indoor spatial learning assisted by mobile 3D information displays. In C. Stachniss, K. Schill, and D. Uttal (Eds.). *Proceedings of Spatial Cognition VIII: Lecture Notes in Computer Science* (pp. 163-172). (corresponding author). DOI: 10.1007/978-3-642-32732-2_10
- Jacobson, K.E., Giudice, N.A., & Moratz R. (2011). Towards a theory of spatial assistance from a phenomenological perspective: Technical and social factors for blind navigation. In R. Moratz & N.A. Giudice. (Eds.) Extended Poster Abstracts from the Conference on Spatial Information Theory (COSIT 2011). Pp. 33-36. Belfast, ME. (corresponding author).
- Giudice, N.A., Walton, L.A., & Worboys, M. (2010). The informatics of indoor and outdoor space: A research agenda. In *Proceedings of the 2nd ACM SIGSPATIAL International Workshop on Indoor Spatial Awareness* (ISA 2010) (pp. 47-53). DOI: 10.1145/1865885.1865897 (corresponding author).
- Giudice, N.A., & Tietz, J. (2008). Learning with virtual verbal displays: effects of interface fidelity on cognitive map development. In C. Freksa, N. Newcombe, P. Gärdenfors, & S. Wölfl (Eds.), *Proceedings of Spatial Cognition VI: Lecture Notes in Artificial Intelligence* (pp. 121-137). DOI: 10.1007/978-3-540-87601-4_11 (corresponding author).
- Riehle, T.H., Lichter, P., & Giudice, N.A. (2008). An indoor navigation system to support the visually impaired. Proceedings of the 30th Annual IEEE Engineering in Medicine and Biology Conference. (pp. 4435-4438). DOI: 10.1109/IEMBS.2008.4650195 (corresponding author).
- Giudice, N.A., Marston, J.R., Klatzky, R.L., Loomis, J.M., & Golledge, R.G. (2008). Environmental learning without vision: Effects of cognitive load on interface design. In *Proceedings of the 9th International Conference on Low Vision* (Vision 08). (corresponding author).
- Tjan, B.S., Beckmann, P.J., Roy, R., Giudice, N.A., & Legge, G.E. (2005). Digital sign system for indoor wayfinding for the visually impaired. In *Proceedings of the 2005 IEEE Computer Society Conference on Computer Vision and Pattern Recognition* (CVPR) – Workshops. (p. 30A). San Diego, CA. DOI: 10.1109/CVPR.2005.442

5.8 Partially Refereed National / International Conferences (64):

Talks and partially refereed short papers, extended abstracts, and posters.

- Palani, H.P., Mukherjee, J., & Giudice, N.A. (2025). Accessible Math Materials in Real-Time Using AI. Talk: 40th Annual CSUN Assistive Technology Conference, Mar 14, Anaheim, CA.
- Robinson-Moore, W.J., Kluthe, T., Roy, N., Tennison, J.L., Giudice, N.A., Willliams, H., Gorlewicz, J.L., Stefik, A., & Smith, D.W. (2025). Accessible, Multimodal Charts and Graphs on Touchscreens. Talk: 40th Annual CSUN Assistive Technology Conference, Mar 13, Anaheim, CA.

- Palani, H.P. & Giudice, N.A. (2024). Enabling real-time document accessibility using AI. Talk: 39th International CSUN Assistive Technology Conference. Anaheim CA, USA.
- Gorlewicz, J.L., Robinson-Moore, W., Roy, N., Tennison, J.L., & Giudice, N.A. (2024). Accessible, Multimodal Charts and Graphs on Touchscreens. Talk: 39th International CSUN Assistive Technology Conference. Anaheim CA, USA.
- Palani, H.P. & Giudice, N.A. (2023). Bridging the access gap in SAT preparation. Talk: 38th International CSUN Assistive Technology Conference. Anaheim CA, USA.
- Tennison, J.L., Gorlewicz, J.L., Smith, D.W., Stefik, A., & Giudice, N.A. (2023). Digital Graphicacy: Exploring Charts and Graphs with Haptics. Talk: 38th International CSUN Assistive Technology Conference. Anaheim CA, USA.
- Tennison J.L., *Goswami S., Hairston J.R.,* Smith D.W., Giudice N.A., Stefik A., and Gorlewicz J.L. (2022). Comparison of Traditional Methods to Emerging Technologies. Presented at the 2022 AERBVI International Conference, St. Louis, MO, 2022.
- *Fink, P.D.S.* & Giudice, N.A. (2021). Vibrotactile maps for promoting spatial understanding in autonomous vehicles. Talk: 8th International Conference on Spatial Cognition (ICSC 2021). Sept. 13-17, Rome, Italy (virtual).
- Gorlewicz, J.L., *Tennison, J.L*., *Uesbeck, P.M*., Richard, M.E., Palani, H.P., Stefik, A., Smith, D.W., & Giudice, N.A. (2020). Design Guidelines and Recommendations for Multimodal, Touchscreen-based Graphics. Talk: 22nd International ACM SIGACCESS Conference on Computers and Accessibility (ASSETS '20). October (remote conference).
- *Tennison, J.L., Uesbeck, P.M*., Smith, D.W., Giudice, N.A., Stefik, A., & Gorlewicz, J.L. (2019). Seeing through touch: Multisensory graphics for students with visual impairments. Poster: The Coalition for National Science Foundation Exhibition. April, Wash. D.C.
- *Bennett, C.R.* and Giudice, N.A. (2018). Aging and Cognitive Map Decay: Effectiveness of Compensatory Augmentations. Poster: 2nd biannual Interdisciplinary Navigation Symposium (iNav 2018). June 25-29, Quartier Tremblant, CANADA.
- *Doore, S.A.,* Beard, K., and Giudice, N.A. (2018). Natural-language spatial cues for learning and navigating indoor environments. Talk: 2nd biannual Interdisciplinary Navigation Symposium (iNav 2018). June 25-29, Quartier Tremblant, CANADA.
- *Jensen, N.A., Rasmussen, W.E.O.,* Doore, S.A., and Giudice, N.A. (2018). Comparing Vibrotactile Smartphone Interfaces for Supporting Nonvisual Navigation of Virtual Environments. Poster: 2nd biannual Interdisciplinary Navigation Symposium (iNav 2018). June 25-29, Quartier Tremblant, CANADA.
- *Kaplan, T.M., Jensen, N.A., Haase, K.N*., Guenther, B.A., and Giudice, N.A. (2018). A Multimodal Thermographic Interface to Aid Nonvisual Navigation. Poster: 2nd biannual Interdisciplinary Navigation Symposium (iNav 2018). June 25-29, Quartier Tremblant, CANADA.
- *Haase, K.N.,* Perry, R.J., and Giudice, N.A. (2018). Immersive 3D Haptics for Navigating Virtual Space. Poster: 7th International Conference on Spatial Cognition (ICSC 2018). Sept. 10-14, Rome, Italy.
- Guenther, B.A., *Jensen, N.A., Butler, B., Haase, K.N., Kaplan, T.M*., and Giudice, N.A. (2018). Comparison of Learning with Vibro-audio Maps vs. Traditional Tactile Maps. Poster: 7th International Conference on Spatial Cognition (ICSC 2018). Sept. 10-14, Rome, Italy.
- Doore, S.A., Beard, K., and Giudice, N.A. (2018). Conceptual structure and object salience in indoor scene descriptions. Talk: 7th International Conference on Spatial Cognition (ICSC 2018). Sept. 10-14, Rome, Italy.

- *Palani, H.P.* and Giudice, N.A. (2017). Principles for Designing Large-Format Refreshable Haptic Graphics Using Touchscreen Devices: An Evaluation of Nonvisual Panning methods. Talk: The 19th International ACM SIGACCESS Conference on Computers and Accessibility (ASSETS'17). Oct 30 to Nov 1, Baltimore MD, USA.
- *Kaplan, T.P.* and Giudice, N.A. (2017). Evaluation of Multimodal Scene Access Interfaces Supporting Spatial learning and Navigation. Poster: The Association of American Geographers Annual Meeting (AAG'17). April 2-5, Boston, MA.
- *Kaplan, T.M., Fortier-Brown, A., Bennett, C.R.*, & Giudice, N.A. (2016). Evaluation of Virtual Reality Simulation as a Supplemental Treatment in Cases of Seasonal Affective and Anxiety Disorders. Poster: 57th Annual Psychonomics Society Meeting. November 17-20, Boston, MA.
- *Richards, S.M., Bennett, C.R.,* & Giudice, N.A. (2016). Virtual Reality Exposure Therapy for Veterans with PTSD. Poster: 57th Annual Psychonomics Society Meeting. November 17-20, Boston, MA.
- *Doore, S.A*., Beard, K., and Giudice, N.A. (2016). Spatial preposition use in indoor scene descriptions. Talk: The Ninth International Conference on Geographic Information Science (GI Science '16). Sept. 27-30, Montreal, CA.
- *Doore, S.A.,* Beard, K., and Giudice, N.A. (2016). A room with a (verbal) view: Spatial linguistic structures supporting indoor scene descriptions. Talk: Spatial Cognition 2016 conference. Aug. 2-5, Philadelphia, PA, USA.
- *Bennett, C.R*. and Giudice, N.A. (2016). Cognitive map decay in older adults: Evaluating use of virtual reality driving simulations. Poster: Spatial Cognition 2016 conference. Aug 2-5, Philadelphia, PA, USA.
- *Li, H.* and Giudice, N.A. (2016). Assessment of multi-level structural and topological properties on cognitive map development in multi-level built environments. Poster: Spatial Cognition 2016 conference. Aug. 2-5, Philadelphia, PA, USA.
- Teisl, M.F., Noblet, C.L., Corey, R.R., and Giudice, N.A. (2016). Using VR Technology to assess tourist reactions to an offshore windfarm. Talk: Northeastern Agricultural and Resource Economics Association Annual Workshop. June 22-23, Bar Harbor, ME.
- *Palani, H.P*., and Giudice, N.A. (2016). Usability parameters for touchscreen-based haptic perception. Talk: Work in progress paper presented at the IEEE Haptics Symposium. April, Philadelphia PA, USA. (corresponding author)
- *Bennett, C.R.* and Giudice, N.A. (2015). Developing compensatory augmentations for aging and navigation. Poster: 6th International Conference on Spatial Cognition: "Space and Situated Cognition". Sept., Rome, Italy.
- *Bennett, C.R*., Giudice, N.A., Klatzky, R.L. & Loomis, J.M. (2013). Spatial aging and memory load on the updating of multiple target arrays. Poster: 54th Annual Psychonomics Society Meeting. November, Toronto, Canada.
- *Li, H*. & Giudice, N.A. (2012). Details-on-demand mobile visual interface for facilitating indoor wayfinding. 7th Annual GIScience Conference. September, Columbus, OH
- *Bennett, C.R*., Loomis, J.M., Klatzky, R.L., & Giudice, N.A. (2012). Minimal effects of memory load on the updating of multiple target arrays. Poster: 53rd Annual Psychonomics Society Meeting. November, Minneapolis, MN.
- Giudice, N.A., *Bennett, C.R*., Klatzky, R.L., & Loomis, J.M. (2012). Haptic spatial updating across the lifespan. Poster: 53rd Annual Psychonomics Society Meeting. November, Minneapolis, MN.

- *Bennett, C.R.,* & Giudice, N.A. (2012). The effects of life span development on spatial updating of haptic arrays. Poster: Spatial Cognition 2012. September, Monastery Seeon, Germany.
- *Kesavan, S*., & Giudice, N.A. (2012). Automated natural language description of indoor spaces. Poster: Spatial Cognition 2012. September, Monastery Seeon, Germany.
- *Jain, S.* & Giudice, N.A. (2012). Assessment of spatial audio interfaces for blind and low vision users. Talk: Think Tank Consortium, in conjunction with the International Conference on Auditory Displays (ICAD2012). June, Atlanta, Georgia.
- *Jain, S.* & Giudice, N.A. (2012). Evaluating hand motion based spatial audio for indoor navigation. Talk: Think Tank Consortium, in conjunction with the International Conference on Auditory Displays (ICAD2012). June, Atlanta, Georgia.
- *Jain, S*. & Giudice, N.A. (2012). Navigating indoor spaces with spatial audio. Poster: Association of American Geographers Annual Meeting (AAG2012). February, New York.
- *Li, H*. & Giudice, N.A. (2012). Assessing the optimal visual granularity level for assisting indoor navigation. Poster: Association of American Geographers Annual Meeting (AAG2012). February, New York.
- *Palani, H*. and Giudice, N.A. (2012). A Vibro-Audio Interface for Accessing Graphical Information using Touch-Based Devices. Poster: The 14th International ACM SIGACCESS Conference on Computer and Accessibility (Assets '12). Boulder, CO, USA.
- *Bennett, C.R*., Giudice, N.A., Klatzky, R.L., & Loomis, J.M. (2011). Spatial images developed through extended touch: Comparing updating performance between haptic and visual learning. Poster: 52nd Annual Psychonomics Society Meeting. November, Seattle, WA.
- *Jain, S*. & Giudice, N.A. (2011). Assessing audio interfaces for use in an indoor navigation system. Poster: Conference on Spatial Information Theory (COSIT 2011). September, Belfast, ME.
- *Kesavan, S*. & Giudice, N.A. (2011). Automated natural language description of indoor spaces. Poster: Conference on Spatial Information Theory (COSIT 2011). September, Belfast, ME.
- *Li, H*. & Giudice, N.A. (2011). Finding the optimal visual interface for assisting navigation. Poster: Conference on Spatial Information Theory (COSIT 2011). September, Belfast, ME.
- *Raja, M.K*. & Giudice, N.A. (2011). Haptic spatial learning of indoor spaces using touchscreen enabled smartphone devices. Poster: Conference on Spatial Information Theory (COSIT 2011). September, Belfast, ME.
- *Bennett, C.R*. & Giudice, N.A. (2011). Spatial images developed through extended touch: Comparing updating performance between haptic and visual learning. Poster: Conference on Spatial Information Theory (COSIT 2011). September, Belfast, ME. (Won doctoral presentation award)
- *Cuddy, K.M*. & Giudice, N.A. (2010). Spatialized audio for remembering auditory target azimuths. Poster: Spatial Cognition 2010 Conference. August, Ft. Hood, OR.
- Wolbers, T., Wutte, M., Klatzky, R.L., Loomis, J.M., & Giudice, N.A. (2010). Modality independent coding of 3D layout: fMRI evidence for PPA involvement of haptic and visual scenes. Poster: 16th Annual Meeting of the Organization for Human Brain Mapping. June, Barcelona, Spain.
- Wolbers, T., Wutte, M., Klatzky, R.L., Loomis, J.M., & Giudice, N.A. (2010). Modality independent coding of 3D layout: fMRI evidence for PPA involvement of haptic and visual scenes. Poster: Meeting of the German Society of Experimental Psychologists. March, Saarbrücken, Germany.

- Giudice, N.A., Wutte, M., Klatzky, R.L., Loomis, J.M., & Wolbers, T. (2009). Modality independent coding of 3D layout: fMRI evidence for PPA involvement of haptic and visual scenes by sighted and blind participants. Poster: 50th Annual Psychonomics Society Meeting. November, Boston, MA.
- Marston, J.R., Klatzky, R.L., Giudice, N.A., Loomis, J.M., & Golledge R.G. (2007). Measuring cognitive load of non-visual navigation interfaces. Poster: Association of American Geographers (AAG) 104th Annual Meeting. April, San Francisco, CA.
- May, M., Giudice, N.A., LaPierre, C., & Ponchillia, P. (2007). Results from 5-Year NIDRR wayfinding grant and future prospects. Talk: 22nd Annual CSUN International Conference, Technology and Persons with Disabilities. March, Los Angeles, CA.
- Giudice, N.A., Betty, M.R., & Loomis, J.M. (2006). Orientation specificity with vision and touch: Map learning, haptic updating, and functional equivalence. Poster: Vision Sciences Society (VSS'06) conference, Journal of Vision. 6(6), p. 178a.
- Kalia, A., Legge, G.E., & Giudice, N.A. (2006). Learning virtual building layouts: The effects of age on the usefulness of geometric and nongeometric visual information. Poster: Vision Sciences Society (VSS'06) conference, Journal of Vision. 6(6), p. 140a.
- Giudice, N.A. (2006). Wayfinding without vision: Learning real and virtual environments using dynamically-updated verbal descriptions. Talk: Conference on Assistive Technologies for Vision and Hearing Impairment. July, Kufstein, Austria.
- Kalia, A., Giudice, N.A., & Legge, G.E. (2005). Learning building layouts with low vision: Do realistic details help or hinder? Talk: Vision 2005 Conference. April, London, UK.
- Kalia, A., Giudice, N.A., & Legge, G.E. (2004). Learning building layouts: The effects of visual information on developing global knowledge. Talk: Object Perception, Attention, and Memory Conference. November, Minneapolis, MN.
- Giudice, N.A. & Legge, G.E. (2004). Comparing verbal and visual information displays for learning building layouts. Poster: Vision Sciences Society (VSS'04) conference, Journal of Vision. 4(8), p. 889a.
- Giudice, N.A., Legge, G.E., & Bakdash, J.Z. (2003). Navigating without vision: A role for spatial language? Poster: Vision Sciences Society (VSS'03) conference, Journal of Vision. 3(9), p. 489a.
- Legge, G.E., Mason, S.J., Brady, M., Giudice, N.A., & Schlicht, E.J. (2003). Maplets: Local geometrical components of human cognitive maps. Talk: Vision Sciences Society (VSS'03) conference, Journal of Vision. 3(9), p. 136a.
- Giudice, N.A. (2002). Tactile vision: Brain-reorganization in the blind: Implications for learning and adaptive technology. Talk: Seventeenth Annual CSUN International Conference on Technology and Persons with Disabilities. March, Los Angeles, CA.
- Giudice, N.A., Mason, S.J., & Legge, G.E. (2002). The relation of vision and touch: spatial learning of small-scale layouts. Poster: Vision Sciences Society (VSS'02) conference, Journal of Vision. 2(7), p. 522a.
- Schlicht, E.J., Legge, G.E., Stankiewicz, B.J., & Giudice, N.A. (2001). Are visual landmarks necessary for effective transfer of navigational knowledge between real and virtual buildings? Poster: Annual Meeting of the Association of Research in Vision and Ophthalmology. Fort Lauderdale, FL.
- Giudice, N.A., Madison, C.M., Zhuang, J.C., Costello, P.A., Legge, G.E., Hu, X., & He, S. (2000). Tactile vision in the blind: An fMRI experiment on pattern recognition and brain plasticity.

Poster: Annual Meeting of the Association for Research in Vision and Ophthalmology. Supp. IOVS, 40, S49, Fort Lauderdale, FL.

- Bruggeman, H., Giudice, N.A., Stankiewicz, B.J., & Legge, G.E. (2000). Distal target localization by the blind. Poster: Annual Meeting of the Association for Research in Vision and Ophthalmology. Supp. IOVS, 40, S431, Fort Lauderdale, FL.

5.9 UMaine & Regional Conferences (55), 16 student research excellence awards):

- *Elkadi, A*. & Giudice, N.A. (2024). Gauging human trust through the use of a multimodal, omnidirectional, and immersive autonomous vehicle simulator. Poster: UMaine Student Research Symposium, April.
- Herbert, V.M., Perry, R.J., *LeBlanc, C*., Haase, K.N., Corey, R.R., Giudice, N.A., & Howell, C.L. (2021). Developing a smartphone app with augmented reality to support virtual learning of nursing students on heart failure. Poster: 1st UMS Nursing Research Symposium, October, Portland, ME.
- *Holz, J.A*., Haase, K.N., & Giudice, N.A. (2020). Increasing Access to Graphical Information for Blind and Visually Impaired People: Evaluating the usability of two haptic feedback methods using a touchscreen-based system. Abstract: UMaine Student Research Symposium, April.
- *Fink, P.D.S*. & Giudice, N.A. (2020). Learning to Trust Autonomous Vehicles. Abstract: UMaine Student Research Symposium, October.
- *Palani, H.P.* and Giudice, N.A. (2018). Perceptual Parameters and Design Guidelines for rendering Graphical materials on Touchscreen devices to support Blind and Visually-Impaired Users. Talk: UMaine Student Research Symposium, April, Cross Insurance Center, Bangor, ME.
- *Herrschaft, G.* and Giudice, N.A. (2018). Facilitating Meaningful Interpersonal Interactions Through a Virtual Space. Talk: UMaine Student Research Symposium, April, Cross Insurance Center, Bangor, ME.
- *Haase, K.N.,* Perry, R.J., and Giudice, N.A. (2018). 3D Haptics for Nonvisual Spatial Learning and Navigation. Poster: UMaine Student Research Symposium, April, Cross Insurance Center, Bangor, ME.
- *Jensen, N.A.* and Giudice, N.A. (2018). Comparing Visual Augmentations for Navigation of Indoor Spaces. Poster: UMaine Student Research Symposium, April, Cross Insurance Center, Bangor, ME.
- *Rasmussen, W.E.O., Jensen, N.A*., Doore, S.A. and Giudice, N.A. (2018). Comparing Vibrotactile Smartphone Interfaces for Nonvisual Navigation of Indoor Routes. Talk: UMaine Student Research Symposium, April, Cross Insurance Center, Bangor, ME.
- *Palani, H.P*. & Giudice, N.A. (2017). Principles and Guidelines for Advancement of Touchscreen-Based Graphic Screen Readers. Poster: UMaine Student Research Symposium, April, Cross Insurance Center, Bangor, ME. [Winner of the 2017 Innovation award]
- *Kaplan, T.M*. & Giudice, N.A. (2017). Development of a Dynamic Multisensory Interface to Provide Accessible Scientific Diagrams for Blind and Low Vision Students. Poster: UMaine Student Research Symposium, April, Cross Insurance Center, Bangor, ME. [Awarded best project in the undergraduate education category]
- *Palani, H.P.* and Giudice, N.A. (2016). Multimodal access to graphical information for blind and visually-impaired people using touchscreen-based devices. Poster: UMaine Student Research Symposium, April, Cross Insurance Center, Bangor, ME. [Awarded 1st prize for posters]

- *Bennett, C.R*. and Giudice, N.A. (2016). Do cognitive maps decay with age? Talk: UMaine Student Research Symposium, April, Cross Insurance Center, Bangor, ME. [Honorable mention for talks]
- *Kaplan, T.M., Fortier-Brown, A.* & Giudice, N.A. (2016). Evaluation of Virtual Reality Simulation as a Supplemental Treatment in Cases of Seasonal Affective Disorder. Interactive exhibition: UMaine Student Research Symposium, April, Cross Insurance Center, Bangor, ME.
- *Peters, B.M*., Corey, R.R., & Giudice, N.A. (2016). Dynamic Motion Control: Networked Control Software and Expanded Physical Capabilities for Virtual Environment Motion Feedback Devices. Talk: UMaine Student Research Symposium, April, Cross Insurance Center, Bangor, ME.
- *Richards, S.M., Bennett, C.R.,* and Giudice, N.A. (2016). Virtual Reality Exposure Therapy for Veterans with PTSD. Poster: UMaine Student Research Symposium, April, Cross Insurance Center, Bangor, ME.
- *Gates, S.C.P*., Corey, R.R., & Giudice, N.A. (2015). Multi-Tag Radio Frequency Indication for use in Indoor Positional Tracking Systems. Interactive Exhibition: UMaine Center for Undergraduate Research (CUGR) Showcase, April, UMaine, Orono, ME. [Jointly awarded 1st prize for demos]
- *McGrath, T.C*., Corey, R.R., & Giudice, N.A. (2015). Development of a Non-Visual Indoor Navigation Assistive Device Using Real-Time Tracking and Multimodal Feedback. Interactive Exhibition: UMaine Center for Undergraduate Research (CUGR) Showcase, April, UMaine, Orono, ME.
- *Peters, B.M*., Corey, R.R., & Giudice, N.A. (2015). Low-Power Device for Indoor Mapping and Navigation. Interactive Exhibition: UMaine Center for Undergraduate Research (CUGR) Showcase, April, UMaine, Orono, ME.
- *Hurlburt, M.T*., Corey, R.R., & Giudice, N.A. (2015). Monitoring Independently Aging Adults with Radio Frequency Indicator Technology: An Inexpensive and Noninvasive Solution for Aging in Place. Interactive Exhibition: UMaine Center for Undergraduate Research (CUGR) Showcase, April, UMaine, Orono, ME. [Jointly awarded 1st prize for demos]
- *Sleight, D.A*., Corey, R.R., & Giudice, N.A. (2015). Dynamic Motion Control: Developing a 6 DOF Motion Platform for use in Virtual Environments. Interactive Exhibition: UMaine Center for Undergraduate Research (CUGR) Showcase, April, UMaine, Orono, ME.
- *Bennett, C.R*. & Giudice, N.A. (2015). Improving Spatial Aging through the Use of Compensatory Augmentations. Talk: UMaine Graduate Exposition. April, Orono, ME. [Awarded 1st prize by the UMaine Graduate School]
- *Li, H.* & Giudice, N.A. (2015). Effects of Basic Multi-level Properties on Indoor Wayfinding. Talk: UMaine Graduate Exposition. April, Orono ME. [Awarded 3rd prize by the UMaine Graduate School]
- *Bennett, C.R*. & Giudice, N.A. (2014). Exploring Effects of Age on Driving through Virtual Simulation. Poster: UMaine Graduate Exposition, April, UMaine, Orono, ME.
- *Palani, H.P.* & Giudice, N.A. (2014). Towards a Better Understanding of Non-Visual Spatial Representation. Poster: UMaine Graduate Exposition, April, UMaine, Orono, ME. [Awarded 1st prize by the UMaine Graduate School]
- *Palani, H.P*. & Giudice, N.A. (2014). Touch to see. Video presentation: UMaine Graduate Exposition, April, UMaine, Orono, ME. [Awarded 1st prize by the UMaine Graduate School]
- *Perry, R.J.,* Corey, R.R., & Giudice, N.A. (2014). Poster: UMaine Graduate Exposition, April, UMaine, Orono, ME.

- *McGrath, T.C.*, Corey, R.R., & Giudice, N.A. (2014). Non-visual indoor navigation using three-dimensional auditory displays and sensory feedback from Mobile devices. Interactive Exhibition: UMaine Center for Undergraduate Research (CUGR) Showcase, April, UMaine, Orono, ME. [Awarded 1st prize for demos]
- *Sleight, D.A.*, Corey, R.R., & Giudice, N.A. (2014). Mobile Mapping Applications: Developing site-specific access to multimodal interfaces for geospatial navigation. Interactive Exhibition: UMaine Center for Undergraduate Research (CUGR) Showcase, April, UMaine, Orono, ME.
- *Cole, J.D.*, Corey, R.R., & Giudice, N.A. (2014). Virtual simulations of compensatory techniques for age-related vision loss. Interactive Exhibition: UMaine Center for Undergraduate Research (CUGR) Showcase, April, UMaine, Orono, ME.
- *Allain, S.*, Corey, R.R., & Giudice, N.A. (2014). Virtual modeling of forest populations in Maine given the introduction of invasive plant species. Poster: UMaine Center for Undergraduate Research (CUGR) Showcase, April, UMaine, Orono, ME.
- *Hurlburt, M.T.*, Corey, R.R., & Giudice, N.A. (2014). Using virtual reality to model offshore wind turbines. Poster: UMaine Center for Undergraduate Research (CUGR) Showcase, April, UMaine, Orono, ME.
- *Bennett, C.R.* & Giudice, N.A. (2014). Research topics in spatial navigation and aging. Talk: 5th Annual Mainely Data Conference. May, UMaine, Orono, ME.
- *Li, H.* & Giudice, N.A. (2014). Multi-level cognitive maps for supporting indoor wayfinding. Talk: 5th Annual Mainely Data Conference. May, UMaine, Orono, ME.
- *Palani, H.* & Giudice, N.A. (2014). Perception & representation of spatial information by visually-impaired users. Poster: 5th Annual Mainely Data Conference. May, UMaine, Orono, ME.
- *Li, H.* & Giudice, N.A. (2013). Determining the Optimal Visual Interface Supporting Multi-level Indoor Wayfinding, Talk: International Spatial Cognition Summer Institute (ISCSI), August, Santa Barbara, CA.
- *Cole, J.D.*, Corey, R.R & Giudice, N.A. (2013). Virtual simulation of driving scenarios with age-related vision loss. Interactive Exhibition: UMaine Center for Undergraduate Research (CUGR) Showcase, April, UMaine.
- *Kesavan, S.* & Giudice, N.A. (2012). Translating photos of indoor scenes into natural language descriptions. Talk: CINACS Summer School Workshop on Multimodal Information Processing. September, University of Hamburg, Germany.
- *Bennett, C.R.*, & Giudice, N.A. (2012). The Spatial Image: Multiple Research Studies. Talk: 3rd Annual Mainely Data Conference. June, Colby College, Waterville, ME.
- *Kesavan, S.* & Giudice, N.A. (2012). Translating Photos of Indoor Scenes into Natural Language Descriptions. Talk: UMaine Graduate Exposition, April, UMaine. [Awarded 2nd prize by the UMaine Graduate School]
- *Palani, H.P.* & Giudice, N.A. (2012). Navigation assistance for visually impaired persons using touch based devices. Poster: UMaine Graduate Exposition, April, University of Maine. [Awarded 2nd prize by the UMaine Graduate School and received a Commercialization Award]
- *Bennett, C.R.* & Giudice, N.A. (2012). The Spatial Image: A Look through Multiple Research Studies. Talk: UMaine Graduate Exposition, April, UMaine. [Awarded 3rd prize by the UMaine Graduate School]

- *Bennett, C.R*. & Giudice, N.A. (2012). The effects of life span development on spatial updating of haptic arrays. Poster: UMaine Graduate Exposition, April, UMaine. [Awarded 3rd prize by the UMaine Graduate School]
- *Jain, S*. & Giudice, N.A. (2012). Comparing head versus hand motion based spatial audio interfaces for indoor navigation. Poster: UMaine Graduate Exposition, April, UMaine.
- *Li, H.* & Giudice, N.A. (2012). Assessing the visual granularity of 3D indoor maps. Poster: UMaine Graduate Exposition, April, UMaine.
- *Cole, J.D*., Corey, R.R, & Giudice, N.A. (2012). Age Related Vision Loss in the Context of Driving. Interactive Exhibition: UMaine Center for Undergraduate Research (CUGR) Showcase, April, UMaine.
- *Leger, J.R.*, Corey, R.R, & Giudice, N.A. (2012). Visual Augmentation for Aging and Navigation. Interactive exhibition: UMaine Center for Undergraduate Research (CUGR) Showcase, April, UMaine.
- *Raja, M.K*. & Giudice, N.A. (2011). Indoor Navigation for Low-Vision and Blind Users. Poster: UMaine Graduate Exposition, April, UMaine. [awarded Best Student Poster Award]
- *Bennett, C.R*. & Giudice, N.A. (2011). Development of Spatial Images through Extended Touch: Comparing Updating Performance against Haptic Inspection and Vision. Poster: UMaine Graduate Exposition, April, UMaine
- *Li, H.* & Giudice, N.A. (2011). Finding the Minimal Information Set for Assisting Navigation in Multilevel Indoor Spaces. Poster: UMaine Graduate Exposition, April, UMaine.
- *Jain, S*. & Giudice, N.A. (2011). Assessing Audio Interfaces for use in an Indoor Navigation System. Poster: UMaine Graduate Exposition, April, UMaine
- *Kesavan, S*. & Giudice, N.A. (2011). Automated natural language descriptions of indoor spaces. Poster: UMaine Graduate Exposition, April, UMaine.
- *McGrath, T*., Corey, R.R., & Giudice, N.A. (2010). 3D Viewshed Creation for Virtual Reality Applications. Poster: NSF SuperMe REU 2010 Symposium, August, UMaine.
- *Raja, M.K*. & Giudice, N.A. (2010). Indoor Positioning and Indoor Location-Based Services. Poster: UMaine Graduate Exposition, April, UMaine.
- *Cuddy, K.M*. & Giudice, N.A. (2009). Information Requirements for Indoor Navigation. Poster: UMaine Graduate Exposition. April, UMaine.

5.10 Theses and Unpublished Works (17):

- Fink, P.D.S. (2023). Accessible autonomy: Exploring inclusive, multimodal autonomous vehicle design for people who are blind and visually impaired. Unpublished Doctoral Dissertation, May 2023, The University of Maine. (N.A. Giudice: thesis advisor).
- Palani, H.P. (2018). Principles and Guidelines for Advancement of Touchscreen-Based Non-visual Access to 2D Spatial Information. Unpublished Doctoral Dissertation, Apr. 2018, The University of Maine. (N.A. Giudice: thesis advisor).
- Herrschaft, G, (2018). Facilitating meaningful interpersonal connections through a virtual space. Unpublished Undergraduate Honors Thesis, Apr. 2018, The University of Maine. (N.A. Giudice: thesis advisor).
- Haase, K.N. (2018). Immersive Virtual Haptics for Nonvisual Shape Recognition. Unpublished Masters project, Aug. 2018, The University of Maine. (N.A. Giudice: thesis advisor).

- Cole, J.D. (2017). Kino: A Software and Hardware Platform to Empower Research with Wearable Augmented Reality Devices. Unpublished Masters thesis project, Dec. 2017, The University of Maine. (N.A. Giudice: thesis advisor).
- Perry, R.J. (2017). Conveying Topographic Information with 3D Printed Models and Tactile Maps. Unpublished Masters Thesis, May 2017, The University of Maine. (N.A. Giudice: thesis advisor).
- Bennett, C.R. (2017). Spatial Cognitive Aging: Cognitive Map Decay and Compensatory Augmentations for Older Adults. Unpublished doctoral dissertation, February 2017, The University of Maine. (N.A. Giudice: thesis advisor)
- Li, H. (2016). Evaluation of multi-level cognitive maps for supporting between-floor spatial behavior in complex indoor environments. Unpublished doctoral dissertation, May 2016, The University of Maine. (N.A. Giudice: thesis advisor)
- Graf, C. (2013). Schematization in Hard-copy Tactile Orientation Maps. Unpublished doctoral dissertation, Dec. 2013, University of Bremen, Germany. (N.A. Giudice: thesis co-advisor)
- Palani, H. (2013). Making Graphical Information Accessible Without Vision Using Touch-Based Devices. Unpublished Master's Thesis, Nov. 2013, The University of Maine. (N.A. Giudice: thesis advisor).
- Kesavan, S. (2013). Indoor Scene Knowledge Acquisition Using Natural Language Descriptions. Unpublished Master's Thesis, May 2013, The University of Maine. (N.A. Giudice: thesis advisor)
- Jain, S. (2012). Assessment of Audio Interfaces for Use in Smartphone Based Spatial Learning Systems for the Blind. Unpublished Master's Thesis, Dec. 2012, The University of Maine. (N.A. Giudice: thesis advisor)
- Ramos, R.M. (2012). Improving Assistive Technology Through Phenomenology: A Comparative Analysis of Research Methods. Unpublished Undergraduate Honors Thesis, May 2012, The University of Maine. (N.A. Giudice: thesis advisor)
- Raja, M.K. (2011). The development and validation of a new smartphone based non-visual spatial interface for learning indoor layouts. Unpublished Master's Thesis, Dec. 2011, The University of Maine. (N.A. Giudice: thesis advisor)
- Cuddy, K.M. (2010). The Efficacy of Virtual Spatialized Audio for Perceiving and Remembering Azimuths of Auditory Targets. Unpublished Master's Thesis Project, May 2010, The University of Maine. (N.A. Giudice: thesis advisor)
- Giudice, N.A. (2004). Navigating Novel Environments: A Comparison of Verbal and Visual Learning. Unpublished doctoral dissertation, Dec. 2004, UMN.
- Giudice, N.A. (1999). Advances in Personal Navigation Systems for the Blind: A Review and Proposal for Tomorrow's Technology. Unpublished whitepaper. UMN

6. INVITED PRESENTATIONS (84)

Given by N.A. Giudice unless otherwise indicated

Summary Metrics:

- *46 invited talks / workshops*
- *14 keynote talks*
- *21 lectures / panel talks*
- *1 podcast*
- *1 demo*
- *1 blog*

6.1 Talks and Keynotes (59):

2025 (May 15) Accessible STEM for blind students: Kicking butt and taking names on the path to success. Keynote talk at the 2nd annual Accessing STEM in Higher Education Workshop. UC Irvine (virtual).

2024 (Nov. 3) Inclusive navigation for people with visual impairment: Tools, tips, and rationale for focusing on the complete trip. Invited talk at the Third American Academy of Optometry Think Tank on Low Vision Research. Indianapolis, IN, USA.

2024 (May 1) Why Autonomous technology matters: Some navigation examples, their relevance to blind travelers, and a call to action. Invited Keynote talk at The Pine Tree Guide Dog User's (PTGDU) 2024 annual meeting (virtual).

2023 (May 22) An update on AVA (the autonomous vehicle assistant): Past, present, and future. Invited talk, Co-presented with R. R. Corey and P. D. S. Fink, The Inclusive Design Challenge, DOT (virtual).

2023 (Apr. 20) Using accessible technology to improve O&M training, travel independence, & vocational opportunities: Current practices and future directions. Invited Keynote talk at The Future of Digital Health Work Retreat. New York University Schools of Engineering, Medicine & Business. New York, USA.

2023 (Mar. 31) Accessibility fragmentation: Considerations, solutions, and some examples for breaking down information-access silos. Invited talk at Clemson University, School of Computing Speaker Series (virtual).

2022 (July 15) Accessibility silos: Considerations for bridging the information-access fragmentation divide. Invited keynote talk at the ICCHP-AAATE joint International Conference on Digital Inclusion, Assistive Technology and Accessibility. Lecco, Italy.

2022 (May 3) Improving accessibility of graphical information: Promoting inclusion through multisensory visualizations. Invited Keynote talk at the Center for Spatial and Textual Analysis, Stanford University (virtual).

2022 (Mar. 24) AI Personas for Blind and Sighted User Trust Across the Complete Trip of Driving. Co-presenter with P. D. S. Fink (lead). *2nd International Conference on Embodied Intelligence,* Cambridge, UK (virtual).

2022 (Mar.15) Improving inclusion in STEM fields: It's time for information visualizations to move beyond vision. Invited Keynote talk at the National Academies of Sciences, Engineering, and Medicine Conversation series on Improving Accessibility and Inclusion in Field, Laboratory, and Computational Science. Washington D.C. (Virtual).

2022 (Feb. 14) Blind navigation indoors and out: Grand challenges and promising solutions. Invited talk at the Bartiméus low vision and blindness expertise center, the Netherlands (Virtual).

2022 (Jan. 24) AVA: An Accessible Ride-hailing, Mobility, and Navigation Tool for Fully Autonomous Vehicles. Co-presenters: Giudice, N.A., Corey, R. R., & Allen, A. *Inclusive Design Challenge Showcase and Design Challenge*, Washington D.C. (virtual).

2021 (Nov. 9) The future of FAVs for BVI people: Accessibility, safety, and policy considerations. Co-presenter with P.D.S. Fink: Workshop on Autonomous vehicles, Braille Institute, Santa Barbara, CA (virtual).

2021 (July 21) Help Drive the Future of Driving. Co-presented with P.D.S. Fink: American Council of the Blind 60th Annual Conference and Convention. ACB, Alexandria, VA (virtual).

2021 (May 13) Federal Accessibility Standards for Autonomous Vehicles. Co-presenter with P.D.S. Fink: *Day One Technology Policy Accelerator Showcase.* Day One Project, Washington D.C. (virtual).

2021 (Jan. 14) Grand challenges in blindness research: The role of multimodal, bio-inspired technology solutions of the future. Keynote talk: *AccessComputing+CREATE* undergraduates with disabilities research workshop, U. Washington, WA, (virtual conference).

2020 (Oct. 23) COVID-19 and blindness- Impacts on environmental perception and interaction during travel. Invited talk at the State of the Science on Rehabilitation Technology in Blindness and Low Vision. Smith-Kettlewell Eye Research Institute (virtual conference).

2020 (Feb. 14) The Grand Challenges of Blind Spatial Cognition: What is Needed for Solutions in 2020 and Beyond. Invited talk: UCSB Cognition, Perception, and Cognitive Neuroscience lecture series. Santa Barbara CA.

2019 (Oct.) Access technology for 2020 and beyond: The role of Autonomous vehicles in BVI independence. Keynote talk: Beyond 2020 Conference: Innovations in emerging technologies, services, and programs for blindness and low vision. Cambridge Innovation Center, Cambridge MA.

2019 (July) Unar Labs and information access. Invited talk (with H. Palani): Guide Dog Users Inc. (GDUI) national convention. Rochester, NY, USA.

2019 (July) Multimodal information access: Why the best visualizations transcend vision. Invited talk: Gordon Research Conference, Visualization in Science, and Education Section, Bates College, ME.

2019 (Mar.) Blinded by vision: What the brain tells us about technology development. Invited "Genius talk": 4th annual Maine science Festival, Bangor, Maine.

2018 (Dec.) Challenges with VR and AR technology as a research tool: It's time to shit or get off the pot! Invited Talk: School of Computing and Information Science's Research Colloquium, UMaine.

2018 (Nov.) Promoting inclusion through information-access technologies: Where we are and where we need to go. Invited talk: Equity, Access and Inclusion conference, A World Usability Day event, UMaine.

2018 (Oct.) The keys to independence. Keynote Grand marshal talk: White Cane Day, The Iris Network. Portland ME.

2018 (July) Aira: Accessing visual information when and where you need it. Invited talk: Guide Dog Users Inc. (GDUI) national convention. St. Louis, MO, USA.

2018 (Mar.) Touchscreen-based information access: Psychophysically-inspired usability evaluations. Keynote talk: Smith-Kettlewell Eye Research Institute Haptics Symposium, in honor of Val Morash, San Francisco, USA.

2017 (Sept.) Indoor Navigation without Vision: Promise and Progress. Invited talk: Indoor Positioning and Indoor Navigation Conference. Sapporo, Japan.

2016 (Dec.) A vision for MIST as a catalyst for facilitating geo-spatial industry-academic partnerships, workforce development, research initiatives, and educational opportunities in Maine and beyond. Invited talk: Maine Institute for Spatial Technologies (MIST) conference. Freeport ME, USA.

2016 (June) The importance of sports education for understanding biomechanics and building confidence in young blind athletes. Keynote talk: Maine Organization of Blind Athletic and Leadership Education (MOBALE) 1st annual Summer camp. Waterville ME, USA.

2016 (June) Multimodal spatial cognition: Relevance to spatial technologies. Invited talk: iNav, 1st biannual Interdisciplinary Navigation Symposium. Bad Gastein, Austria.

2015 (July) Improving Nonvisual Environmental Awareness Using Multimodal Information Access Technology. Invited Talk: PRISM Lecture Series, City College of New York (CUNY), New York, USA.

2015 (June) Improving Navigation and Independence in Older Adults Using Compensatory Augmentation. Invited Pecha Kucha Talk: UMaine Aging Initiative Workshop. Orono Me, USA.

2015 (May) Technology for Aging. Invited talk: 10th Annual UMaine Geriatrics Colloquium. Orono ME, USA.

2015 (Mar.) The Science of Aging: Technology Innovation to Aid Older Adults. Invited talk: Maine Science Festival, Panel on Aging. Bangor ME, USA.

2014 (Nov.) Bridging the Gap Between Human-Information Processing and Human-Centered Design Research: Improving the Development of Non-visual Assistive Technology. Invited talk: DUB (HCI & Design) seminar series. University of Washington, Seattle WA, USA.

2014 (Oct.) Using Virtual Reality as a Tool for Improving Wind Energy Visualization. Invited talk: Senator George J. Mitchell Center for Sustainability Solutions. University of Maine, Orono ME, USA.

2014 (Sept.) Linking Behavioral and Neuroimaging Research with Assistive Technology Development: Problems and Progress. Invited talk: symposium on Merging Neuroplasticity, Education, and Rehabilitation in the Blind. Radcliffe Institute, Harvard University, Cambridge MA, USA.

2014 (June) Space is the Common Denominator: From Human Information Processing to Multimodal Interface Design. Keynote talk: Workshop on Empowering Blind Students in Science and Engineering (EBSSE). University of Washington, Seattle WA, USA.

2014 (Mar.) Designing Non-visual Interfaces for Spatial Learning and Navigation: Bridging the Gap Between Basic and Applied Research. Keynote talk: symposium on visual rehabilitation. Emory University School of Medicine. Atlanta GA, USA.

2014 (Mar.) Using Vibro-audio Interfaces for Graphical Access by Blind People. Invited Talk: American Council of the blind (ACB) of Maine. Tele-conference.

2013 (Dec.) Access Technology Through User-Centered Design. Invited talk: Maine Department of blindness and Visual Impairment Annual meeting. Augusta ME, USA.

2013 (Nov.) The Role of Touchscreen Displays for Non-visual Graphical Access. Invited talk: Tactile Research Group Annual Meeting. Toronto, Canada.

2013 (Aug.) Designing Non-visual Displays: Using Human-Centered Computing to Avoid the Engineering Trap. Invited talk: Workshop on Environmental Sensing Technologies for Visual Impairment (ESTVI 2013). Smith-Kettlewell Eye Research Institute, San Francisco CA, USA.

2012 (Sept.) Using Multimodal Information Displays in Spatial Cognition Research. Keynote talk: CINACS Summer School Workshop on Multimodal Information Processing, University of Hamburg, Germany.

2012 (Aug.) Moving Beyond the Vision-only Bottleneck: Using Multimodal Information in Virtual Reality Research. When is Virtual Reality Real Enough? Invited talk: Workshop on Using VR in Spatial Cognition Research. In conjunction with Spatial Cognition 2012, Kloster Seeon, Germany.

2011 (Dec.) Toward Universal Access to Seamless Travel of Indoor and Outdoor Spaces with and Without Vision. Invited talk: Center for Transportation Studies, University of Minnesota, Minneapolis MN, USA.

2009 (Nov.) Multimodal Processing of Spatial Information: The Intersection of Spatial Cognition and Neurocognitive Engineering. Invited talk: Institute for Research in Cognitive Science, University of Pennsylvania, Philadelphia PA, USA.

2009 (July) A Year with Giudice: Research, Development, and Future Directions. Invited talk: The Minnesota Laboratory for Low-Vision Research, University of Minnesota, Minneapolis MN, USA.

2009 (April) Spatial Learning from Different Sensory Modalities: The Intersection of Experimental Psychology and Neurocognitive Engineering. Invited talk: University of Maine Psychology Colloquium, Orono ME, USA.

2008 (Feb.) Spatial Learning in Real and Virtual Environments: Navigation, Cognitive Mapping, and the Development of Multimodal Displays. Invited talk: Department of Psychology, Wichita State University, Wichita KS, USA.

2008 (Feb.) Multimodal Learning: When Different Spatial Displays Lead to the Same Spatial Behavior. Invited talk: Department of Geography, University of Oregon, Eugene OR, USA.

2007 (Dec.) Spatial Learning in Real and Virtual Environments: Development of Mental Representations using Multimodal Displays. Invited talk: Department of Spatial Information Science and Engineering, University of Maine, Orono ME, USA.

2006 (June) What's Going on in GiudiceLand: Research Past, Present, and Future. Invited talk: The Minnesota Laboratory for Low-Vision Research, University of Minnesota, Minneapolis MN, USA.

2006 (May) Orientation Specificity with Vision and Touch: Map Learning, Haptic Updating, and Functional Equivalence. Invited talk: Cognition, Perception, & Cognitive Neuroscience Colloquium, University of California, Santa Barbara CA, USA.

2005 (Apr.) Wayfinding with Words: The Use of Spatial Language for Navigating Real and Virtual Environments. Invited talk: Cognitive and Perceptual Sciences Colloquium, University of California, Santa Barbara CA, USA.

2004 (Mar.) NIH: National Eye Institute, Scientific Workshop on Blindness, Brain Plasticity, and Spatial Function. Invited participant: Vanderbilt University, Nashville TN, USA.

2002 (Oct.) Universal Design, Adaptive Technology, and Integration. Invited talk: Usability Professionals Association (UPA), Minneapolis MN, USA.

2000 (Jan.) The Relation of Vision and Touch in an Angle Estimation and Production Task. Invited talk: Vision Science Colloquium, University of Minnesota, Minneapolis MN, USA.

6.2 Demos, Guest Lectures, Panel Discussions, and Round-Table Talks (23):

2025 (May 27) Paths to graduate school for all who have the guts. Invited fireside chat with Stacy Branham's intro to HCI course (300 students). UC Irvine (virtual).

2024 (Nov. 14) Research demo exhibition on accessible STEM content and inclusive user interfaces. Northeast annual conference of the Association for the Education and Rehabilitation of the Blind and Visually Impaired (AER). Stowe, VT, USA.

2024 (Oct. 6) AI for Autonomous Navigation. Invited Panel speaker, with Amos Miller (CEO, Glidance), Troy Otillio (CEO, Aira), and Mike May (moderator). M-Enabling Summit. Washington D.C.

2023 (Dec. 7) Dot 2.0, an update of the Dot Pad dynamic tactile display. Panel moderator, with Dot Inc. Co-founder/CEO Eric Ju Yoon Kim and Co-founder/CBDO Ki Kwang Sung; Sight Tech Global (virtual conference).

2023 (Mar. 8) Automated driving systems: Accessible for All Users. Expert panelist to support a NHTSA research project on accessibility.

2022 (Nov. 30) How to Select Technology and Design Instruction: Knowledge, Skills and Abilities that Generalize Across Tools and Settings. Perspectives from Higher Education Experts in Orientation and Mobility. Invited webinar Panelist With Robert Wall Emerson and Sarahelizabeth Baguhn. Sponsored by the Center for Innovation, Design, and Digital Learning (CIDDL), the University of Kansas.

2022 (Sept. 1) Navigating organizations and tenure. Invited panelist and senior mentor at the 2022 BRAINS (Broadening the Representation of Academic Investigators in NeuroScience) Fellows Symposium, Bainbridge island, Seattle WA, USA.

2022 (Aug. 31) Exploring career paths. Invited panelist and senior mentor at the 2022 BRAINS (Broadening the Representation of Academic Investigators in NeuroScience) Fellows Symposium, Bainbridge island, Seattle WA, USA.

2022 (Aug. 30) Establishing your own research program. Invited panelist and senior mentor at the 2022 BRAINS (Broadening the Representation of Academic Investigators in NeuroScience) Fellows Symposium, Bainbridge island, Seattle WA, USA.

2021 (Dec. 2) Indoor Navigation: Can Inertial Navigation, Computer Vision, and other new technologies Work Where GPS Can't? Panel moderator, with Mike May (Goodmaps), Roberto Manduchi (UC Santa Cruz), and Paul Ruvolo (Olin College); Sight Tech Global (virtual conference)

2021 (Apr. 14) AI in AVs roundtable, VEMI Lab, part of Maine Impact Week.

2021 (Jan. 13) Researchers with disability: The role of technology, innovation, and self-advocacy. Chair for student break-out panel at the *AccessComputing+CREATE* undergraduates with disabilities research workshop, U. Washington, WA, (virtual conference)

2020 (Dec. 3) Wayfinding: Finding the mark. Panel participant, with Tim Murdoch and Mike May, Sight Tech Global, a TechCrunch spin-off (virtual).

2020 (Dec. 3) Augmented reality and perception: What's the best way to get the message across? Panel moderator, with Amos Miller, Ashley Tuan, and Sile O'Modhrain; Sight Tech Global, a TechCrunch spin-off (virtual conference).

2020 (Sept. 29) Invited participant in the Creating Accessible Web Map Widgets panel, part of the W3C/OGC Joint Workshop Series on Maps for the Web (virtual conference).

2016 (June 4) Co-led panel discussion on using VR in studying navigation, part of Spatial Cognition 2016, Philadelphia PA, USA. (With E. Chrastil, S. Creem-Regehr, and T. Wolbers).

2015 (June 22) Co-led round table discussion on technology and aging, University of Maine, Orono ME, USA. (With A. Abedi).

2015 (May 14) Co-led panel discussion on using VR in K-12 STEM education, University of Maine, Orono ME, USA. (With R.R. Corey).

2014 (June 3) Led panel on conducting accessible research in STEM disciplines, University of Washington, Seattle WA, USA.

2013 (Apr.) Computer Science guest lecture "Introduction to HCI," University of Maine, Orono ME, USA.

2010 (Dec. 1) IGERT guest lecture "HCI and Sensors: Research and applications," University of Maine, Orono ME, USA.

2009 (Dec.) IGERT guest lecture "Indoor Navigation: Research and Applications," University of Maine, Orono ME, USA.

2004 (Mar.) Panel participant at the National Eye Institute Scientific Workshop on Blindness, Brain Plasticity, and Spatial Function. Vanderbilt University, Nashville TN, USA.

6.3 Blogs, Interviews, and Podcasts (2):

2024 (June) Autonomous vehicles and robotic guide dogs. Invited guest on the Living Blindfully podcast, hosted by Jonathan Mosen.

2024 Beyond the Image: Tackling the Graphical Access Crisis for Blind and Low Vision Individuals. Guest Blog with Jenna Gorlewicz and Amy Keith for the DEI committee of American Society of Engineering Education (ASEE). https://diversity.asee.org/deicommittee/2024/12/18/beyond-the-image-tackling-the-graphical-access-crisis-for-blind-and-low-vision-individuals/

7. CONSULTING AND ADVISORY (20)

Summary Metrics: Provided expert input on 20 projects, including:

- *NSF / NIH/NIDLIRR grants*
- *Phase I and II SBIR / STTR projects*
- *Start-up / commercial scientific advising*

2024-Present Advisory Council member for America's Volunteer Driver Center; a division of ITN*America*. This center is establishing a program to recruit and train volunteer drivers to support the dynamic and growing mobility needs of America's aging population.

2024-2027 Advisor on DoD, Defense Health Program grant entitled "Ambulatory Brain Interface for Enhanced Navigation and Training (AMBIENT)." (S. Elkin-Frankston& A. Gardony, PIs, Draper Labs).

2023-2028 Advisory board for NIDILRR Rehabilitation Engineering Research Center (RERC) grant entitled "Mobilizing Non-Visual Digital Maps." (J. Coughlan, PI, Smith-Kettlewell Eye Research Institute).

2023-2025 Advisor on NIH STTR grant entitled "Audiom: Developing an Indoor Non-Visual Mapping System." (B. Biggs, PI, Smith-Kettlewell Eye Research Institute).

2021-2024 Scientific Advisory Board member on NIDLIRR Grant entitled "Precise Customized Navigation for All, Indoors and Outdoors." (Mike May, PI, GoodMaps INC.).

2021-2024	Scientific Advisory Board member on Smart and Connected Community (SCC) Grant entitled Transportation Gaps and Disability-Related Unemployment: Smarter Cities and Wearables combating Commuting Challenges for the Blind." (JR Rizzo, PI, NYU).
2016-2022	Consulting for Click and Go Wayfinding Maps, LLC., provided scientific and technical guidance on multiple projects related to development of narrative descriptions for use in wayfinding systems in large commercial properties and transportation venues.
2016-2017	Senior Advisor, University of Maine System (UMS) research re-investment fund (RFF) grant entitled "Revolutionizing Computing Across the University of Maine System" (H. Onsrud, PI).
2015-2017	Consultant on NIH R01 grant studying non-visual access to digital displays (with J. Coughlan (PI), Smith-Kettlewell Eye Research Institute).
2015-2019	Consultant on FAA grant studying airport navigation with visual impairment (with G.E. Legge, UMN (PI); B. Tjan USC; and C. Downey, Architecture for the Blind).
2014-2020	Consultant for Fauxsee Innovations, LLC, on Phase I/II SBIR / STTR R&D projects on information access technology for blind/low-vision people.
2012-2019	Consultant for MOAI Technologies, LLC, on Phase I/II SBIR / STTR R&D projects on assistive technology for blind/low-vision people.
2012-2015	Collaboration with UMaine's Climate Change Institute on developing immersive VR and AR simulations of climate science phenomena.
2012-2013	R&D contract with Majella Global Technologies on dynamic spatial visualizations using mobile platforms.
2008-Present	Consultant for Advanced Medical Electronics Corporation on Phase I/II SBIR projects on assistive technologies for blind/low-vision information access.
2008-2011	Advisory board for NIH grant 9R44AG033522-02 on indoor navigation (PI: G.E. Legge, UMN, and Advanced Medical Electronics Corporation, Minneapolis, MN).
2007-Present	Consultant for Koronis Biomedical Technologies on Phase I/II SBIR projects on blind/low-vision navigation technology.
2007-2011	Advisory board for Kinnexxus Inc., advising on factors affecting age-related vision loss for gerontechnology start-up company, Los Altos, CA.
2006-2007	Efficacy testing of Touch Graphics Talking Tactile Tablet for multimodal navigation research (www.touchgraphics.com).
2003-2006	Usability testing during several Beta cycles with Sendero Group's accessible GPS navigation system (www.senderogroup.com).

8. ADVISING, SUPERVISING, AND MENTORING (139)

Summary Metrics: 119 students advised / mentored, including:

- *1st advisor for 6 doctoral students, 11 masters students, 2 undergraduate honors theses, and 5 undergraduate capstone projects.*
- *Supervisor for 3 postdocs, 9 staff, 8 Post-Bachelor students, 83 undergraduate students, 3 internships, 9 high school student research experience / summer internships, and 4 Top Scholar students.*
- *Transdisciplinary focus with VEMI student backgrounds from 26 disciplines (6 current).*
- *98% of graduated VEMI students are employed or enrolled in terminal graduate degrees.*

8.1 Professional and Pre-tenure Faculty Mentoring (11):

I believe strongly in the importance of providing guidance and mentorship to promising faculty and researchers in the early stages of their career. I have supported early career faculty and industry professionals from across a range of science and engineering fields on tools, techniques, and strategies for successful Tenure and promotion, grant writing, publications, student mentoring, and other academic, institutional, and industry-related activities needed for building a thriving research lab and developing a programmatic research career.

- Brandon Biggs, MS (Smith-Kettlewell Eye Research Institute)
- Stacy Doore, Ph.D. (Colby College, Computer Science)
- Paul Fink, Ph.D. (UMaine, Postdoc in VEMI Lab)
- Sepideh Ghanavati, Ph.D. (UMaine, Computer Science)
- Jenna Gorlewicz, Ph.D. (St. Louis University, Mechanical Engineering)
- Ben Guenther, Ph.D. (UMaine, Psychology)
- Caitlin Howell, Ph.D. (UMaine, Biomedical Engineering)
- Greg Nelson, Ph.D. (UMaine, Computer Science)
- Hari Palani, Ph.D. (Roux Institute and Northeastern University, Data Visualization)
- Nimesha Ranasinghe, Ph.D. (UMaine, Spatial Computing)
- Jessica Riccardi, Ph.D. (UMaine, Communication Sciences and Disorders

8.2 Postdocs, Staff, and Other Personnel (10):

2023-Present	Emily Blackwood, Accessibility Manager
2024-Present	Justin Brown, VEMI Research Manager
2023-2025	Paul Fink, Postdoc
2021-2022	Nate Brown, Financial and Research Accessibility Coordinator
2021-2022	Adrian Arias-Palomo, Software Engineer
2019-2021	Kaitlyn Haase (MS), VEMI Research Coordinator
2018-Present	Grant Beals, VEMI Research Associate and Audio Engineer
2017-Present	Raymond (RJ) Perry (MS), VEMI Lab Technical Coordinator
2016-2018	Benjamin Guenther (Ph.D.), Postdoc
2016-2018	Stacy Doore (Ph.D.), Postdoc and VEMI Research Coordinator

8.3 Doctoral Thesis Research (First Advisor) (5):

2018-2023	Paul Fink: Learning to trust in Autonomous Vehicles.
2014–2018	Hari Palani: Vibro-audio Interface Testing and Development
2010–2017	Chris Bennett: Spatial Cognition and Functional Equivalence
2010–2016	Hengshan Li: Spatial Cognition and Indoor Navigation
2011–2013	Christian Graf: Haptic Map Production (co-advised with Christian Freksa, University of Bremen, Germany).

8.4 Master's Thesis / Project Research (First Advisor) (11):

2024-2025 Faith Chepkoech

2024-Present Andy Howe

2023-2024 Karalyn Kutzer

2017-2018 Kaitlyn Haase: Assistive technology and spatial navigation

2015-2017 Jon Cole: Compensatory Augmentations and Virtual Reality for Information Visualization

2012-2017 Raymond Perry: Augmented and Virtual Reality for Information Visualization

2011-2013 Hari Palani: Indoor Navigation with Vibro-audio Interfaces

2010-2013 Saranya Kesavan: Visual-spatial Image Conversion

2010-2012 Shreyans Jain: Indoor Navigation Spatial Audio Interfaces

2009-2011 Monoj Kumar Raja: Vibro-audio Touchscreen Interfaces for Offline Learning

2008-2010 Kate Cuddy: Virtual Spatialized Audio

8.5 Coursework Masters Advising-MSIS program (first advisor)

27 coursework Masters students advised including:

- Current: 15
- Graduated: 7 (2023); 3 (2024); 2 (2025)

8.6 Post-Bachelor & Other Supervising/Mentoring (8):

2018-2019 Christina Leblanc: B.S. Secondary Education and English (Co-mentored with Richard Corey)

2016-2023 Emily Blackwood: B.A. Anthropology, MS Quaternary & Climate Studies, University of Maine (Co-mentored with Richard Corey)

2015-2017 Kendra Bird: B.A. Anthropology, MS Quaternary & Climate Studies, University of Maine (Co-mentored with Richard Corey)

2014-2015 Kristin Doherty: B.S. Communications (Co-mentored with Richard Corey)

2010 Joshua Gaylin: B.S. Microbiology

2010 Lin Lin: Masters. Electrical Engineering

2008 Magdalena Wutte: Grad. Neuroscience

2002-2007 Jonathan Bakdash: B.S. Psychology

8.7 Honors Thesis Advising (2):

2018 (April) Gene Herrschaft: New Media, UMaine

2012 (May) Rafael (Mick) Ramos: Psychology/Philosophy, UMaine (Co-Advised with K.E. Jacobson)

8.8 Capstone Advising (5):

2022-2023 Roisin Rumsey: Interdisciplinary Studies

2021-2022 Aubree Nygaard: Computer Science

2021-2022 Zane Nygaard: Computer Science

2017-2018 Nicholas Jensen: Psychology

2015-2016 Ethan Porter: Computer Science

8.9 Undergraduate Research Advising 1+ Semesters in Lab (82):
(Unless otherwise noted, all students jointly supervised with Richard Corey)

2024-2025 Ethan Kelley: Anthropology
2024-Present Tommy Murphy: Physics
2024-Present Monica Agneta: Computer Science
2024-Present Mason Chadwick: Physics
2023-2024 Hannah Milne: Chemical Engineering
2023-2024 Nick Millet: Computer Science
2023-2024 Andy Howe: Computer Science
2023-2025 Riley Mills: Computer Science
2023-2025 Aisha Harris: Psychology
2023-2025 Adam Elkadi: Biomedical Engineering
2023-2025 Rachael Coombs: Biomedical Engineering
2022-2023 Jake Loranger: Biomedical Engineering
2022-2024 Aleigha Morgan: Physics
2022-2025 Ersilda Cako: Computer Science
2021-2024 Ainslie Allen: Biomedical Engineering
2021-2024 Henry Kindler: Computer Science & Psychology
2021-2022 Georgia Doore: Ecology & Environmental Studies
2020-2024 Anthony Caccees: Computer Science (Top Scholar Student)
2020-2023 Maher Alsamsam: Biomedical Engineering
2020-2022 Zane Nygaard: Computer Science
2020 Adan Lawlor: Psychology
2020 Eric Marshall: Accounting and Finance
2019-2023 Roisin Rumsey: Interdisciplinary Studies
2019-2023 Theo Erikson: Mechanical Engineering Technology (Top Scholar Student)
2019-2022 Aubree Nygaard: Computer Science
2019-2021 Tian Morrison: Bioengineering (Top Scholar Student)
2019-2020 Jessica Holtz: Communication Science Disorders
2018-2021 Colleen DeMaris: Computer Science (Top Scholar Student)
2018-2021 Isaac Sparks-Willey: Computer Science
2018-2020 Nate Brown: Accounting and Financing
2018-2020 Oisin Biswas: Computer Science
2018-2019 Anna Webber: Bioengineering

2018-2019	Dan Lesko: Bioengineering
2018-2019	Coulter Morrill: Kinesiology
2018	Betelhem Abay: Bioengineering
2018	Justin Hafner: Kinesiology
2018	Timothy Alholm: New Media
2017-2020	Adam Farrington: Computer Science
2017-2020	Maggie Karas: Social Work
2017-2020	Sophia Crockett-Current: New Media
2017-2018	Christina Leblanc: Education and English
2017-2018	Rob Owens: Computer Science
2017	Todd Hawkins: Computer Science
2017	Eddie Abandanzioi: Computer Science
2016-2020	Walter Rasmussen: Mechanical Engineering Technology
2016-2019	Bradley Butler: Bioengineering
2016-2018	Nicholas Jensen: Psychology
2016-2018	John San Diego: Computer Science
2016-2017	Allarie Lever: University Studies
2016	Dakoda Brown: Computer Science
2015-2016	Amy Fortier-Brown: New Media
2015-2016	Ethan Porter: Computer Science
2015-2016	Scott Richards: Computer Science:
2015	Emily Blackwood: Anthropology & Earth Sciences
2015	Brian Hodges: Electrical Engineering
2014-2017	Toni Kaplan: New Media
2014-2016	Samuel Gates: Computer Science
2014-2016	Brenden Peters: Computer Science
2014-2015	Peter Coleman: New Media
2014-2015	Jake Lavoie: Studio Arts
2014-2015	Clayton Peterson: Computer Science
2014	Samuel Foster: Physics
2013-2014	Sylvia Allain: Computer Science
2013-2015	Meghan Hurlburt: Computer Science
2012-2015	Dustin Sleight: Mechanical Engineering/Theater
2012-2013	Michelle Beauchemin: Engineering Physics
2011-2012	Joshua Leger: Electrical and Computer Engineering
2011-2012	Ashley Suitter: Psychology

2011-2012 Meghan White: Political Science

2011-2014 Jon Cole: Computer Science

2010-2012 Raymond Perry: Electrical Engineering

2010-2012 Rafael Ramos: Psychology

2009-2015 Tim McGrath: Mechanical Engineering

2009-2010 Tim Baker: Mathematics

2007-2009 Brendan McHugh: Psychology. (N.A. Giudice, advisor)

2007-2008 Kevin Verlatti: Psychology (N.A. Giudice, advisor)

2006-2009 Masaki Miyanohara: Psychology (N.A. Giudice, advisor)

2006-2007 Marina Gorelik: Psychology (N.A. Giudice, advisor)

2006-2007 Marina Nemerovsky: Psychology (N.A. Giudice, advisor)

2005-2009 Maryann Betty: Psychology (N.A. Giudice, advisor)

2005-2006 Brandon Friedman, Psychology (N.A. Giudice, advisor)

2005-2006 Ryan Magnuson: Psychology (N.A. Giudice, advisor)

8.10 Internships (3):

2016 Alex Rizzini: VEMI Lab internship. Graduated, B.A. in English

2012 Alex Salveson Nossum: Ph.D. candidate, Norwegian University of Science & Technology (Fall/Winter)

2011 Samuel Deschamps Berger: VEMI Lab internship, from the National School of Geographic Sciences, France (Summer)

8.11 High School Student Research Experiences / Summer Internships (9):

2018-2019 Roisin Rumsey: High School Research Experience

2018-2019 Max Sennett: High School Research Experience

2018 Theo Erikson: Summer internship

2018 Lily Kim: Summer internship

2018 Tyler Delargy: Summer internship

2016 David Lavoie: Summer internship.

2016 Benjamin Allen-Rahill: Summer internship.

2014 Reed Horton: Summer internship

2011 Dylan Lougee: Summer Internship, High School Upward Bound experience

9. GRADUATE AND HONORS COMMITTEE PARTICIPATION (MEMBER) (18)

Summary Metrics: Member of 18 student committees, including:

- *9 doctoral committees (3 current)*
- *8 Masters committees*
- *2 Undergraduate honors committees.*

9.1 Doctoral Committees (9):

2025-Present Brandon Biggs, Human Centered Computing, Georgia Institute of Technology

2022-Present Chamath Amarasinghe, SIE, UMaine

2021-Present Meetha James, SIE, UMaine

2021 (May) Jennifer Tennison: Mechanical Engineering, Saint Louis University (external advisor)

2017 (May) Chris Dorr, SIE, UMaine

2017 (May) Stacy Doore: SIE, UMaine

2015 (May) Lisa Walton: SIE, UMaine

2015 (May) Liping Yang: SIE, UMaine

2014 (May) Stephanie Pantelides: Psychology, University of Cyprus

9.2 Master's Committees (8):

2022 (May) Chamath Amarasinghe, SIE, UMaine

2021 (May) Amie Koontz: Communications and Human Behavior, Northern Vermont University

2018 (July) Greg Kritzman: SIE, UMaine.

2015 (Dec.) Zachery Schiller: SIE, UMaine.

2012 (May) Brendan Oshaughnessy: SIE, UMaine

2011 (Aug.) John Bell: Intermedia, UMaine

2011 (Aug.) Richard Corey: Intermedia, UMaine

2010 (Dec.) Benjamin Weber: SIE, UMaine

9.3 Undergraduate Honors Committees (2):

2017 (May) Heather Cross: Psychology, UMaine

2011 (May) Zev Eisenberg: New Media, UMaine

10. PUBLIC EDUCATION AND INTERACTIVE EXHIBITIONS (2)

VEMI is the University leader in tours and public outreach exhibitions to UMaine students / stakeholders.

2009-Present More than 500 VEMI public education tours / outreach experiences

2009-Present Over 13,000 people exposed to our work through interactive demos and experiential learning opportunities

11. TEACHING

11.1 Teaching and Educational Philosophy.

My primary teaching interests encompass domains in experimental design/research methods and Human-Computer Interaction — the area of study that couples human sensation, perception, cognition, learning, memory, and attention, with interface design, usability evaluation, user experience, and human factors engineering. My background in experimental psychology and cognitive neuroscience, paired with my research interests in spatial cognition, multimodal interface design, and virtual/augmented reality technology, strongly influence the 'flavor' of my courses.

The guiding tenet of my pedagogical approach is that teaching is an evolving process, and as my students learn from me, I also learn and adapt in response to their divergent backgrounds, talents, and

abilities. I place a high priority on the importance of experiential, student-centric education and emphasize teaching to individual needs and learning capabilities. In addition to my formal classes, this hands-on, experiential spirit is evident in the collaborative culture fostered across graduate and undergraduate students working in the VEMI lab (which I co-founded and cooperatively run / operate with Dr. Richard Corey). My mentorship in this experiential educational process as a large component of my annual teaching load. My goal to merge classroom learning with lab-based experience coupling human-technology design and interaction led to the establishment of a Human-Computer Interaction (HCI) undergraduate minor in 2016 (with Mike Scott) and a Human-Centered Technology & Design (HCTD BS degree in 2023 (with Mike Scott and Nimesha Ranasinghe), both within the School of Computing and Information Science at UMaine. A hallmark of these programs are that students are able to spend multiple semesters in the lab working immersively on collaborative projects with other lab members as part of their degree.

11.2 Frequently Taught Courses

Fall	SIE 515: Human-Computer Interaction (Annually)
Spring	SIE 516: Virtual Environment Technology and Research (Annually)
Summer	SIE 598: Research Topics (yearly, as needed)

12. HONORS AND AWARDS (16)

2025	Received the Presidential Research and Creative Achievement Award, UMaine.
2023	Received the CLAS Outstanding Faculty Award for Research and Creative Achievement, UMaine.
2022	Received invitation to the White House in recognition of prize-winning work on the U.S. dot's inclusive Design Challenge Project, entitled "The Autonomous Vehicle Assistant (AVA): A Complete Trip Solution for Future accessible Mobility".
2021	Recipient of the distinguished Ned E. Freeman Excellence in Writing Award from the American Council of the Blind (ACB) in recognition of the Medium essay "COVID-19 and Blindness," which describes the challenges of blind people during the pandemic: https://medium.com/@nicholas.giudice/covid-19-and-blindness-why-the-new-touchless-physically-distant-world-sucks-for-people-with-2c8dbd21de63
2019	Recipient of the Faculty Mentor Impact Award, UMaine.
2015-Present	Member of the UMaine Spatial Informatics Program Designated as a Prestigious National Center of Academic Excellence in Geospatial Sciences by the National Geospatial Intelligence Agency (NGA) and the US Geological Survey (USGS).
2014-2017	Dean-appointed, Center for Undergraduate Research (CUGR) Fellow
2011	Nominee, UMaine Supervisor of the Year Award
2010	Early Career Research Award, UMaine College of Engineering
2000-2003	Recipient of the UMN's Center for Cognitive Sciences James J. Jenkins Award for Outstanding Contributions to the Center
2000	American Foundation for the Blind Award for Academic Excellence
1998	American Foundation for the Blind Award for Excellent Research Potential
1998	American Council of the Blind Award for Work in Vision Sciences
1998	NSF Facilitation Award for Scientists & Engineers with Disabilities
1997	Inducted into Psychology Honors Society - Psi Chi

1997 Inducted into Philosophy Honors Society - Phi Sigma Tau

13. PROFESSIONAL SERVICE AND LEADERSHIP (38)

Summary Metrics:

- *14 Chair / co-chair positions*
- *8 corporate and nonprofit committees*
- *16 conference / workshop program committees*

2025-Present	Chair, Governance Committee, The Iris Network, Portland Maine.
2025-2026	Co-Chair of the Program Committee organizing the 2026 Conference on Spatial Information Theory (COSIT'26) Conference, York UK (Sept).
2021	Accessibility co-chair on the Organizing Committee for the 23rd International ACM SIGACCESS Conference on Computers and Accessibility (ASSETS'21). (Oct., Virtual conference).
2019-Present	Executive Committee, The Iris Network, Portland Maine.
2019	Member of the Invited UMaine team at the Broadening Participation in Computing (BPC) Workshop, U. Illinois, Urbana, IL.
2018-2019	Technology, Product, & R&D Advisory Committee, AIRA Tech Corp.
2018-2019	Agent and Explorer Advisory Committee, AIRA Tech Corp.
2018	Program committee for the Guide Dog Users Inc. (GDUI) national convention. St. Louis, MO (July).
2018	Program committee for ASSETS'18. Galway, Ireland (October).
2018	Program committee for the Spatial Cognition Conference, Tuebingen, Germany (September).
2017	Member, Executive director search committee, The Iris Network, Portland, ME.
2017	Program committee for the 13th International Conference of Spatial Information Theory (COSIT'17) L'Aquila, Italy (September).
2016-Present	Program Services committee, The Iris Network. Portland, ME.
2016	Chair, Organizing / planning committee for the Maine Institute for Spatial Technologies (MIST) Conference, Freeport Maine (December).
2016	Program committee for ASSETS 2016, Reno, NV. (October).
2015-2017	Co-chair of the MOBALE grants and fund-raising committee.
2015	Program Committee, Cognitive Science Society (CogSci'15), Pasadena, CA. (July).
2015	Program committee for the Conference on Spatial Information Theory (COSIT'15), Santa Fe, NM. (October).
2014	Program committee for ASSETS 2014, Rochester, NY. (October).
2014	Co-chair EBSSE Panel on conducting Accessible Research (June)
2014	Program committee for the Spatial Cognition Conference, Bremen, Germany (September).

2013-Present	Member of the Steering Committee for the Conference on Spatial Information Theory (COSIT).
2013	Program committee for the Conference on Spatial Information Theory (COSIT'13), Scarborough, UK. (September).
2013	Program committee for ASSETS 2013, Seattle, WA. (October).
2012	Workshop general co-chair (with C. GRAF & F. SCHMID), Spatial Knowledge Acquisition Using Low Information Displays (SKALID'12). In conjunction with Spatial Cognition 2012, Kloster Seeon, Germany. (August).
2012	Program Committee, Cognitive Science Society (CogSci'12), Sapporo, JP (August).
2012	Workshop general co-chair (with B. Dara-Abrams), Designing Human-Centered Products and Services for Older Adults. Workshop given in conjunction with the American Society on Aging conference (ASA'12), Washington D.C. (March).
2011	General Co-Chair, Conference on Spatial Information Theory (COSIT'11), Belfast, ME (September).
2011	Program Committee, Workshop on Processes and Events in Spatio-Temporally Distributed Data, with COSIT2011, Belfast, ME (September).
2011	Program Committee, Cognitive Science Society (CogSci2011), Boston, MA (July)
2010	Program Committee, Workshop on Environmental Modeling: Using Space Syntax in Spatial Cognition Research, Mt. Hood, OR (August).
2009	General Chair, Workshop on Virtual Environment Technology for research, UMaine (January).
2006-2008	Chair, monthly interdisciplinary spatial cognition research meeting, UCSB.
2006	Session Chair, Conference on Assistive Technologies for People with Vision and Hearing Impairments, Kufstein, Austria (July).
2000-2003	Chair, Center for Cognitive Sciences external colloquium series, UMN.
2001-2002	Chair, bi-weekly colloquium of vision science lectures, UMN.
1999-2000	Member, Editorial Board, Center for Cognitive Science's Millennium Project, UMN.
1993-1997	Student Congress Representative, Junior Class Vice President, PC.

14. INSTITUTIONAL SERVICE AND COMMITTEE PARTICIPATION (37)

Summary Metrics: Involvement on 36 university committees including:

- *7 on information technology, inclusion, and accessibility*
- *9 on research and resources*
- *3 on curriculum review*
- *4 on policy development*
- *9 on search committees*
- *5 on faculty review and mentorship*
- *Invited external tenure and promotion evaluator for over a dozen faculty*

2025	Chair of the SIE promotion and tenure committee of Nimesha Ranasinghe, UMaine
2025	Member of the VEMI Logistics Manager Search Committee, UMaine

2024-2025	Chair, UX/SCIS faculty Search Committee, UMaine
2024-2025	Member, Spatial Computing faculty Search Committee, UMaine
2023-2024	Co-Chair, Spatial Computing faculty Search Committee,, UMaine
2023-2024	Chair, New Media faculty Search Committee,, UMaine
2023-2024	Member of the combined Business School and SCIS promotion and tenure committee of Manuel Wörsdörfer, UMaine
2023	Member of the VEMI Logistics Manager search committee, UMaine
2023	Chair, Accessibility Manager search committee, UMaine
2023	Member, SCIS Director search committee, UMaine
2021-2023	Invited member, President's Commission on Excellence and Equity (UMaine 2025), UMaine.
2021-2022	Faculty Mentor to Dr. Caitlin Howell in the Enhanced Mentoring Program with Opportunities for Ways to Excel in Research (EMPOWER) Program.
2021-2022	Invited member, MCECIS planning committee for buildings and resources, UMaine
2019-Present	Chair, Spatial Informatics Faculty Peer Committee, UMaine.
2019-2022	Chair, SCIS Interdisciplinary Research Committee, UMaine
2018	Member of the Goldwater Application Review Committee, UMaine
2017-Present	Member of the VEMI Lab annual Rapid Research Week (RRW) Faculty Board, UMaine
2017-2020	Faculty mentor, Top Scholar Program, UMaine
2017	Member, New Media faculty search committee, UMaine
2017	Chair, Spatial Informatics faculty search committee, UMaine
2016-2020	Interdisciplinary disability studies advisory committee, UMaine
2016-2018	CIS Policy advisory committee, UMaine
2015-2016	Office of Research & Sponsored Projects Communications Committee, UMaine
2014-2018	Information Technology Strategic Council (ITSC), UMaine
2014-2018	Information Technology Accessibility Committee (ITAC), UMaine Systems
2013-2020	Chair, CIS committee on research innovation
2013-2014	CIS faculty representative on the UMaine Graduate Board
2011-2017	Information Technology Accessibility Subcommittee for the President's Council on Disabilities, UMaine
2011-2016	Labs and systems committee, CIS, UMaine
2010-2017	President's Council on Disabilities, UMaine
2010-2012	Facilities Management Committee on Pedestrian Access, UMaine
2009-2013	Academic Excellence Committee, UMaine
2008-2011	Accessible Information Committee, UMaine
2003-2004	Student Representative, Center for Cognitive Sciences Governing Council, UMN
1996-1997	Vice Chair, Legislative Affairs Committee, PC

1994-1997 Presidential Appointee, ADA Advisory Committee, PC

1995-1996 Student Representative, Curriculum Review Committee for Providence College Accreditation

15. PROFESSIONAL MEMBERSHIPS & ORGANIZATIONS (8)

Summary Metrics: Present / past affiliation with 8 organizations including:

- *2 blindness advocacy groups*
- *4 scientific societies*
- *2 special interest groups*

2015-Present Member of the Pine Tree Guide Dog User Group

2013-Present ACB of Maine (member)

2012-2015 Full Member, American Society on Aging

2010 Learning Circle on Universal Design, UMaine

2009-2010 Learning Science Special Interest Group, UMaine

2009-2018 Full Member, Psychonomics Society

2009-2018 Delegate, University Consortium for Geographic Information Science

2002-2006 Member, The Vision Sciences Society

16. EDITORIAL SERVICE

Summary Metrics: 100s of reviews in over 70 outlets, including:

- *60 unique scientific journals and conferences,*
- *20+ research grants*
- *2 books*
- *2 expert commentaries*

16.1 Ad Hoc Journal / Conference Reviewer:

ACM SIGACCESS Conference on Computers and Accessibility (ASSETS); ACM Transactions on Applied Perception (TAP); ACM Transactions on Accessible Computing (TACCESS); ACM Transactions on Computer Human Interaction (ToCHI); ACM Sig CHI conference; Assistive Technology; Applied Sciences; Biology Letters; Canadian Journal of Experimental Psychology; Cartography and Geographic Information Science; Cognition; Cognitive Processing; Cognitive Research: Principles and Implications; Cognitive Science; Cognitive Science Conference; Conference on Spatial Information Theory (COSIT); Disabilities; Disability and Rehabilitation; Experimental Child Psychology; Euro Haptics; Frontiers in Neuroscience; Frontiers in Psychology; Gait and Posture; Human-Computer Interaction; IEEE Haptics Symposium; IEEE Transactions on Haptics; IEEE Transactions on Human-Machine Systems; IEEE Transactions on Media; IEEE Transactions on Systems, Man, and Cybernetics; IEEE International Symposium on Mixed and Augmented Reality; IEEE Virtual Reality conference; ISMAR conference; International Journal of Human-Computer Studies (IJCS); International Journal of Environmental Research and Public Health; International Journal of Human-Computer Interaction (IJHCI); Investigative Ophthalmology & Visual Science (IOV); Journal of Spatial Information Science (JOSIS); Journal of Cognitive Psychology; Journal of Experimental Psychology- Applied; Journal of Experimental Psychology- Learning, Memory, and Cognition; Journal of Multimodal User Interfaces; Journal of Navigation; Journal of Visualized Experiments; Journal of Visual Impairment and Blindness (JVIB); Memory and Cognition; Multimodal Technologies and Interaction (MTI); Neuroscience & Biobehavioral Reviews; Patient Education and Counseling; Perception; Perception and Psychophysics; PLOS One; Psychonomic Bulletin & Review (PBR); Psychology of Mathematics Education of North

America conference; Sensors; Spatial Cognition and Computation (SCC); Spatial Cognition conference; Science of Learning; Scientific Reports; Tangible Embedded and Embodied Interaction conference; Transactions on Neural Systems & Rehabilitation; Universal Access in the Information Society (UAIS); and Visual Impairment Research.

16.2 Grant Reviewing:

Invited reviewer on over 20 competitive grant review panels and external evaluations.

U.S. funding outlets: National Institutes of Health (NIH); National Science Foundation (NSF); National Institute on Disability, Independent Living, and Rehabilitation Research (NIDILRR); Department of Education (Doe), Office of Special Ed; Department of defense (DoD); National Cooperative Highway Research Program (NCHRP); National Academies of Science, Transportation Research Board (NAS-TRB); and Veterans Administration (VA)

International funding outlets: ETH Zurich Research Commission; Austrian Science Fund; Netherlands Organization for Health Research and Development; and Institute of Ophthalmology, UCL.

16.3 Book Reviewer:

2015 Springer publications

2008 MIT Press, Cambridge, MA

16.4 Expert Commentary and Analysis:

2014 Where Am I. Reviewed documentary on navigation by Bullfrog Films, written and directed by Bruce Mohun.

2007 The Boy Who Sees with Sound. Helped design and run experiments during filming of this BBC and Discovery channel documentary on echolocation.

16.5 External Tenure and Promotion Evaluator:

Invited external tenure and promotion evaluator for over a dozen faculty.

17. LEGISLATIVE AND POLICY (2)

2022-Present Member. Scholars Strategy Network (SSN), Maine Chapter

2021 (Mar.) Fink, P.D.S. and Giudice, N.A. Technology Policy Accelerator Fellow: Day One Project, an initiative of the Federation of American Scientists. 1 of 30 Fellows selected to identify, develop, and publish a set of technology policy ideas that could be implemented by Congress or the Biden-Harris Administration. Our proposal seeks to translate research related to accessible autonomous vehicles into actionable federal policy.

18. COMMUNITY SERVICE AND OUTREACH (11)

2024 (March) VEMI Lab workshop at the 7th annual Maine Science Festival.

2023 (March) VEMI Lab workshop at the 6th annual Maine Science Festival. Provided hand-on demos with mini research projects and creating data visualizations.

2019 (March) VEMI Lab workshop at the 5th annual Maine Science Festival. In this workshop, kids were taught how to use Python to derive statistics from a dataset, and how to take statistics from recent Twitter data.

2018 (March) VEMI Lab exhibition at the 4th annual Maine Science Festival. In this drop-in workshop, VEMI ran a demo room where kids had the opportunity to explore cutting-

edge research using Vive headsets and iPad tablets and engage in an interactive coding scenario. Cross Insurance Center, Bangor Maine.

2017 (March) VEMI Lab exhibition at the 3nd annual Maine Science Festival. Provided a hands-on seminar on code and 3D modeling for kids. Cross Insurance Center, Bangor Maine.

2016 (March) VEMI Lab exhibition at the 2nd annual Maine Science Festival. Provided interactive demos and presentations of student research to over 2500 members of the community/state from 5 to 80 years of age. Cross Insurance Center, Bangor Maine.

2015 (March) VEMI Lab exhibition at the inaugural Maine Science Festival. Provided interactive demos and presentations of student research to over 4500 members of the community/state from 5 to 80 years of age. Cross Insurance Center, Bangor Maine.

2012-2017 Staff for New England Blind Athletic Association's Annual Summer Sports Education Camp for Blind and Visually Impaired Youth, UMaine, Orono, ME.

2012-2017 Staff for New England Blind Athletic Association's Annual Winter Sports Education Camp for Blind and Visually Impaired Youth, Sunday River Ski Resort, Bethel, ME.

2007-2008 Member of the Access Advisory Committee for the City of Santa Barbara, CA.

2007 Volunteer Computer Instructor, Braille Institute, Santa Barbara, CA.

19. MEDIA, NEWS, AND PUBLIC RELATIONS (96)

Outlets about me, VEMI, or where either are mentioned by name

Summary Metrics: 96 media / publicity pieces

2024 (Oct. 16) The Atlantic "The End of Parallel Parking" Magazine Article

2024 (May 29) Bangor Daily News "Beyond the wheel: UMO's VEMI Lab develops human-centric solutions for the road ahead" News Piece

2024 (May 20) UMaine News "Giudice co-authors award winning guidance on robot guide dogs" News Piece

2024 (Feb. 27) UMaine Annual Research Report "Innovating the roads of tomorrow" News Piece

2023 (Nov.6) UMaine Research News "Imagine That! Tours & The UMaine VEMI Lab: Exploring Human-Centered Evolution of Virtual Environments" News Piece

2023 (Oct.30) The Maine Campus "Decades-old artwork re-discovered in the wall of Carnegie Hall" News Piece

2023 (Apr. 10) News Center Maine "UMaine unveils self-driving simulation to address future gaps with automated transportation" News Piece

2023 (Apr. 5) Mainebiz "UMaine rolls out robo-taxi simulator to help drive vehicle market" News Piece

2023 (Apr. 4) UMaine News "VEMI Lab debuts custom-built multi-person autonomous vehicle simulator" News Piece

2022 (Sept. 6) Grid "Autonomous vehicles were supposed to push gas-powered cars off the road in the future. Will we ever get there?" News Piece

2022 (Aug. 26) The New England Council "UMaine Lab Researching Self-driving Cars and Virtual Reality" News Piece

2022 (Aug. 22) Bangor Daily News "The cutting edge UMaine lab Researching self-driving cars and virtual reality" News Piece

2022 (Aug. 22) Government Technology "UMaine Research Lab Expanding Access to Autonomous Vehicles"News Piece

2022 (Aug. 19) Assistive Technology Update "DOT Inclusive Design Challenge Winners - 3rd Place - AVA app Project with Nicholas Giudice and Richard Corey of VEMI Lab at the University of Maine" Podcast

2022 (Aug.) Ability Magazine "Pete Buttigieg — Building a Better & More Accessible America." News Piece

2022 (July 27) Bangor Daily News "VEMI Lab researchers earn federal prize, invite to White House for software that makes self-driving cars more accessible" News Piece

2022 (July 27) UMaine News "Media features VEMI Lab's federal prize for self-driving car software" News Piece

2022 (July 27) Mass Transit "USDOT names three winners of Inclusive Design Challenge" News Piece

2022 (July 26) U.S. Department of Transportation "On Anniversary of ADA, USDOT Announces Winners of its First-Ever Inclusive Design Challenge" News Piece

2022 (July 26) News Center Maine "UMaine researchers create software that will make rideshare inclusive" News Piece

2022 (July 26) Fox Bangor News "VEMI Labs receives recognition for AVA" News Piece

2022 (July 26) UMaine News "VEMI Lab researchers earn federal prize, invite to White House for software that makes self-driving cars more accessible"News Piece

2022 (Jan. 25) Bangor Daily News "Self-driving vehicles are our future. UMaine is showing us how" News Piece

2021 (Apr. 22) The Maine Question podcast "How can we get the most out of technology?" featuring Dr. Rick Corey, Dr. Caitlin Howell, and Dr. Nicholas Giudice discussing VEMI Lab.

2021 (Mar. 26) Easterseals Crossroads podcast "ATU513 – AVA App Project with Nicholas Giudice and Richard Corey".

2021 (Mar. 15) Inside Autonomous Vehicles "Smartphone App May Help Seniors, People With Disabilities Enjoy Robo-Taxis" News Piece

2021 (Mar. 14) Blind and Beyond radio show "Making AVs accessible for BVI users"

2021 (Feb. 2) Bangor Daily News "App from VEMI Lab group will help people with visual impairments, seniors enjoy ride sharing with self-driving cars" News Piece

2021 (Feb. 1) Fox 22 WFVX "Self-driving car app is coming to Maine" News Piece

2021 (Jan. 29) News Medical "Smartphone app will people with disabilities and seniors use autonomous vehicles" News Piece

2021 (Jan. 29) Science Magazine "App Will Help Visually Impaired, Seniors Enjoy Ride-Sharing With Self-Driving Cars" News Piece

2021 (Jan. 29) Apple News "App will help visually impaired, seniors enjoy ride-sharing with self-driving cars". News Piece

2021 (Jan. 29) UMaine News "App from VEMI Lab group will help people with visual impairments, seniors enjoy ride-sharing with self-driving cars" News Piece

2021 (Jan. 23) Associated Press "UMaine developing ride hailing tool for older residents" News Piece

2021 (Jan. 23) Lewiston Sun Journal "UMaine developing ride hailing tool for visually impaired and older residents" News Piece

2021 (Jan. 23) US News and World Report "UMaine developing ride hailing tool for older residents" News Piece

2021 (Jan. 23) WHDH Tv 7 NEWS Boston "UMaine developing ride hailing tool for older residents" News Piece

2021 (Jan. 19) Senator Susan Collins "Senators Collins, King Announce $300,000 to Connect Seniors with Ride-Hailing Services" Press Release

2021 (Jan. 11) Giudice Audio interview on Connecticut's CRIS Radio Focal Point program discussing COVID-19 and blindness and accessibility research.

2020 (Sept. 9) Dr. Giudice and Dr. Corey discuss autonomous vehicles on the podcast: In Machines We Trust, episode: AI in the Driver's Seat, hosted by Jennifer Strong and MIT Technology Review. Pocast

2020 (July 11) Dr. Giudice discusses VEMI accessibility research and also challenges of navigating with blindness in the COVID-19 environment on the Pulse (accessibility) podcast

2020 (Apr. 15) Medical Press "Researchers find efficacy in new digital map in aiding visually impaired" News Piece

2020 (Mar 27) News Center Maine "New app created in Maine aims to reduce opioid deaths" News Piece

2020 (Mar. 26) Central Maine News "New mobile app is the latest tool to help Mainers fight opioid overdoses" News Piece

2020 (Jan. 17) WABI TV "VEMI lab hosts fifth annual 'Rapid Research Week" News Piece

2020 (Jan. 17) Fox 22 WFVX "University of Maine's VEMI Lab wraps up Rapid Research Week 2020" News Piece

2019 (Aug. 23) UMaine News "UMaine research project focuses on improving trust in autonomous vehicles using human-vehicle collaboration" News Piece

2019 (July 22) Bowdoin College "Virtual Reality Opens Up New Worlds at Bowdoin" News Piece

2019 (Feb. 8) UpStart Maine, "Featured Founder: Creating Digital Media Accessible for the Visually-Impaired" Blog post

2018 (Nov. 28) Bowdoin College "Expanding Access to STEM" News Piece

2018 (Nov. 15) UMaine News "Social Media Spotlight: Justin Hafner" News Piece

2018 (Oct. 24) University of New England Research Seminar "VEMI Lab: Innovation in Research Education"Live Stream

2018 (Aug. 31) The Maine Edge "UMaine receives National Science Foundation grant" News Piece

2018 (June 3) Washington Times "Arkansas man invents 'roboglasses' for the blind" News Piece

2017 (Mar. 08) Blind Abilities Podcast "Second installment in the Aira series: the visual Interpreter for the blind" Podcast

2017 (Feb. 03) ACB Main Menu weekly accessible technology program, "The Aira visual interpreter is introduced" Podcast

2017 (Spring) Maine Alumni Magazine "Eye-opening Education" Magazine Article

2016 (May. 6) UMaine Today "WLBZ reports on sensor technology research to help older adults stay at home" News piece.

2016 (April. 20) VRNews Blog "Virtual Terrain Simulator is a VR Peripheral that Replicates Ground Surfaces" News piece

2016 (Mar. 23) SCIS News "SCIS Students Continue STEM Outreach" News piece

2016 (Feb. 15) SCIS News "VEMI Continues Outreach to Inspire Maine Kids with STEM Education" News piece

2016 (Feb. 11) Lincoln Academy Blog "Virtual Reality: Our Future World? Teen Science Café" News piece.

2015 (Dec. 21) Portland Press Herald "Dartmouth, UMaine aim to help scholars study historic films "News piece

2015 (Dec. 21) UMaine Today "VEMI Lab cited in Dartmouth News Article" News piece

2015 (Dec. 18) Dartmouth Now "Mark Williams and Media Ecology Project Receive NEH Grant" News piece

2015 (Oct. 21) WFVX Fox Bangor - Back to the Future Day. Story

2015 (Aug. 14) WABI TV5 "UMaine Hosts Telehealth Conference" News piece

2015 (Aug. 14) WVII ABC 7 "Senator King Calls for More Telemedicine; Asking for Regulatory Change and Broadband Expansion" News piece

2015 (Aug. 13) King.Sentate.Gov "At Telehealth Roundtable, King Calls for Increased Investment and Federal Support for Telemedicine" News piece

2015 (Aug. 13) MPBN "Sen. King Calls for More Investment in Telemedicine" News piece

2015 (Aug.) University of Maine: Go Maine - Exploring Frontiers at UMaine. Coverage

2015 (June 26) Bangor Daily News "Retirees: These gadgets will help you stay in your home longer" News piece

2015 (June 19) Portland Monthly - Tomorrowland "VEMI Lab Igniting imagination" News piece

2015 (Mar. 21) WABI-TV 5 "First-Ever Maine Science Festival in Bangor" News piece

2015 (Mar. 5) WABI-TV 5 "UMaine Undergrads Assembling Technology to Enhance Virtual Reality Programs" News piece

2015 (Feb. 19) Bangor Daily News "A Republican and Democrat agree: Strong UMaine strengthens state's future" News piece

2014 (Nov. 6) Bangor Daily News "UMaine showcases cross-disciplinary aging research and technology" News piece

2014 (Oct.27) UMaine Today "Wind Turbines Unlikely to Chase Tourists Away, Research Shows" News piece

2014 (Oct. 2) WFVX TV FOX 22 "VEMI Lab Showcases Updated Virtual & Touch Devices" News piece

2014 (Aug. 1) Maine Department of Labor "Program That Prepares Students Who Are Blind or Visually Impaired for College Highlights Opportunity, Teaches Independence" News piece

2014 (May 19) UMaine Today "High-tech Wind Farm Simulation Awaits Monhegan Island Tourists" News piece

2014 (Apr. 22) The Senator George J. Mitchell Center: Sustainability Solutions Initiative News piece

2014 (Mar. 24) The Maine Campus "UMaine VEMI Lab combines research, technology, and friendship" Story

2014 (Feb. 13) WABI TV5 "UMaine Students Show off Virtual Reality". News piece.

2014 (Feb. 13) WVII ABC TV 7 "VEMI Lab on UMaine Campus Holds Open House" News piece

2013 (Feb. 8) Bangor Daily News "UMaine researchers working to shape the future of virtual sight" Story

2013 (Feb. 6) WFVX TV Bangor "Committee Looks to UMaine Students for Workforce Preparedness" Coverage

2013 (Jan. 6) WZON (AM 620) - Ongoing research in the VEMI Lab. Radio interview.

2012 (Dec.) UMaine Today Winter Magazine "Space Travel: How can virtual reality inform our navigation of real-world environments" News piece

2012 (April) UMaine College of Liberal Arts and Sciences Look Book annual Magazine N.A. Giudice and the VEMI Lab. News piece.

2011 (Nov. 10) The Maine Campus "Get plugged in: UMaine virtual reality lab creates something from nothing" News piece

2010 (Dec.) UMaine ORSP Annual Research Highlights on Giudice's NSF grant No. CDI-0835689.

2010 (Nov.) UMaine News piece on Giudice and collaborator's NSF Grant No. CDI-1028895.

2009 (Oct.) VEMI Lab featured in news article for the UMaine College of Engineering Magazine.

2009 (April) Featured on the Economic Report, (CNN & Discovery), as part of a news piece on the Maine-based company Intelligent Spatial Technologies.

2007 (March) Checking the Coordinates. Interviewed for Op-Ed piece on the connection between psychology and geography by R. Adelson (March 2007): APA Monitor on Psychology, 38(3), P.16.

20. OTHER GENERALLY USEFUL SKILLS

- Big "picture" thinker
- Creative problem solver
- Intellectual stimulator
- Professional dog handler
- Well-developed sense of humor
- World-class hugger

21. REFERENCES AND REPRINTS AVAILABLE ON REQUEST

nicholas.giudice@maine.edu
www.umaine.edu/vemi
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