

Keith Vertanen

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EDUCATION

- Ph.D. University of Cambridge, 2009
Thesis: "Efficient Correction Interfaces for Speech Recognition"
Advisor: Sir David J.C. MacKay FRS
- M.Phil. University of Cambridge, Computer Speech, Text and Internet Technology, 2004
Thesis: "Efficient Computer Interfaces Using Continuous Gestures, Language Models, and Speech"
Advisors: Sir David J.C. MacKay FRS and Steve Young FREng
- M.S. Oregon State University, Computer Science, 1999
Thesis: "A Parallel Implementation of a Fluid Flow Simulation using Smoothed Particle Hydrodynamics"
Advisor: Michael Quinn
- B.A. University of Minnesota, Morris, double major: Computer Science (honors) and Math, 1997
Undergraduate research project: "Scheduling Problems in a Practical Allocation Model"
Advisor: Dian Lopez

PROFESSIONAL EXPERIENCE

Dave House Associate Professor in Computing	2022-present
Associate Professor, Michigan Technological University	2019-2022
Assistant Professor, Michigan Technological University	2015-2019
Associate Professor, Montana Tech	2014-2015
Assistant Professor, Montana Tech	2011-2014
Lecturer, Princeton University	2010-2011
Postdoctoral Research Associate, University of Cambridge	2009-2010

RESEARCH DESCRIPTION

I specialize in designing intelligent interactive systems that leverage uncertain input technologies. A particular focus of my research is on systems that enhance the capabilities of users with permanent or situationally-induced disabilities. My broader interests include human-computer interaction (HCI), speech and language processing, mobile interfaces, and crowdsourcing.

AWARDS

- NSF CAREER Award, 2018.
Google Faculty Research Award, 2016.
Best paper, CHI 2015 (lead author).
Best paper honorable mention, ETRA 2012 (co-author).
Best student paper, ASSETS 2012 (co-author).
Best journal paper nominee, TVCG 2021 (co-author).

Best demo runner-up, CHI 2022 (co-author).

Institute of Computing and Cybersystems Achievement Award, Michigan Tech, 2018.

Distinguished Researcher Award, Montana Tech, 2014.

Exceptional instructor evaluation, Michigan Tech: Spring 2019, Spring 2018, Spring 2017, Spring 2016.

CONFERENCE AND JOURNAL PUBLICATIONS

Student co-authors denoted by *. Conference acceptance rates listed where available.

- [1] Gaines, D., **Vertanen, K.** Identifying the Desired Word Suggestion in Simultaneous Audio. In *Proceedings of the International Conference on Pervasive Technologies Related to Assistive Environments (PETRA 2025, to appear)*.
- [2] Gaines, D., **Vertanen, K.** Perceptions of Blind Adults on Non-Visual Mobile Text Entry. In *Proceedings of the International Conference on Pervasive Technologies Related to Assistive Environments (PETRA 2025, to appear)*.
- [3] Nowrin, S. *, **Vertanen, K.** Using Confidence Scores to Improve Eyes-free Detection of Speech Recognition Errors. In *Proceedings of the International Conference on Pervasive Technologies Related to Assistive Environments (PETRA 2025, to appear)*.
- [4] Peters, B., Celik, B., Gaines, D., Galvin-McLaughlin, D., Imbiriba, T., Kinsella, M., Klee, D., Lawhead, M., Memmott, T., Smedemark-Margulies, N., Wiedrick, J., Erdogmus, D., Oken, B., **Vertanen, K.**, Fried-Oken, M. RSVP Keyboard with Inquiry Preview: Mixed Performance and User Experience with an Adaptive, Multimodal Typing Interface Combining EEG and Switch Input. *Journal of Neural Engineering (2025)*, 22(1), 016022.
- [5] Richardson, M., Botros, F., Shi, Y., Guo, P., Snow, B. J., Zhang, L., Dong, J., **Vertanen, K.**, Ma, S., Wang, R. StegoType: Surface Typing from Egocentric Cameras. In *Proceedings of the ACM Symposium on User Interface Software and Technology (UIST 2024)*. Acceptance rate: 22%
- [6] Gaines, D. *, **Vertanen, K.** Improving FlexType: Ambiguous Text Input for Users with Visual Impairments. In *Proceedings of the International Conference on Pervasive Technologies Related to Assistive Environments (PETRA 2024)*.
- [7] Nowrin, S. *, **Vertanen, K.** Leveraging Large Pretrained Models for Line-by-Line Spoken Program Recognition. In *Proceedings of the IEEE Conference on Acoustics, Speech, and Signal Processing (ICASSP 2024)*. Acceptance rate: 45%
- [8] Bonaker, N. *, Nel, E.-M., **Vertanen, K.**, Broderick, T. A Usability Study of Nomon: A Flexible Interface for Single-Switch Users. In *Proceedings of the ACM SIGACCESS Conference on Computers and Accessibility (ASSETS 2023)*. Acceptance rate: 30%
- [9] Adhikary, J. *, **Vertanen, K.** Language Model Personalization for Improved Touchscreen Typing. In *Proceedings of the International Conference on Spoken Language Processing (Interspeech 2023)*. Acceptance rate: 50%
- [10] Nowrin, S. *, **Vertanen, K.** Programming by Voice: Exploring User Preferences and Speaking Styles. In *Proceedings of the 5th Conference on Conversational User Interfaces (CUI 2023)*. Acceptance rate: 37%
- [11] Gaines, D. *, Baker, M. *, **Vertanen, K.** FlexType: Flexible Text Input with a Small Set of Input Gestures. In *Proceedings of the ACM International Conference on Intelligent User Interfaces (IUI 2023)*. Acceptance rate: 24%

- [12] Kristensson, P.O., Mjelde, M., **Vertanen, K.** Understanding Adoption Barriers to Dwell-Free Eye-Typing: Design Implications from a Qualitative Deployment Study and Computational Simulations. In *Proceedings of the ACM International Conference on Intelligent User Interfaces (IUI 2023)*. Acceptance rate: 24%
- [13] Bonaker, N. *, Nel, E.M., **Vertanen, K.**, Broderick, T. A Performance Evaluation of Nomon: A Flexible Interface for Noisy Single-Switch Users. In *Proceedings of the ACM Conference on Human Factors in Computing Systems (CHI 2022)*. Acceptance rate: 25%
- [14] Adhikary, J. *, **Vertanen, K.** Accelerating Text Communication via Abbreviated Sentence Input. *Proceedings of the Joint Conference of the 59th Annual Meeting of the Association for Computational Linguistics and the 11th International Joint Conference on Natural Language Processing (ACL 2021)*. Acceptance rate: 21%
- [15] Adhikary, J. *, **Vertanen, K.** Typing on Midair Virtual Keyboards: Exploring Visual Designs and Interaction Styles. *Proceedings of INTERACT (2021)*. Acceptance rate: 27%
- [16] Gaines, D. *, Kristensson, P.O., **Vertanen, K.** Enhancing the Composition Task in Text Entry Studies: Eliciting Difficult Text and Improving Error Rate Calculation. In *Proceedings of the ACM Conference on Human Factors in Computing Systems (CHI 2021)*. Acceptance rate: 26%
- [17] Adhikary, J. *, **Vertanen, K.** Text Entry in Virtual Environments using Speech and a Midair Keyboard. *IEEE Transactions on Visualization and Computer Graphics (TVCG 2021)*. **TVCG Best Journal Nominee**. Acceptance rate: 16%
- [18] **Vertanen, K.**, Kristensson, P.O. Mining, Analyzing, and Modeling Text Written on Mobile Devices. *Natural Language Engineering (NLE 2019)*, 27(1): 33 pages.
- [19] **Vertanen, K.**, Gaines, D. *, Fletcher, C. *, Stange, A.M. *, Watling, R. *, Kristensson, P.O. VelociWatch: Designing and Evaluating a Virtual Keyboard for the Input of Challenging Text. In *Proceedings of the ACM Conference on Human Factors in Computing Systems (CHI 2019)*. Acceptance rate: 24%
- [20] Dudley, J.J. *, **Vertanen, K.**, Kristensson, P.O. Fast and Precise Touch-Based Text Entry for Head-Mounted Augmented Reality with Variable Occlusion. *ACM Transactions on Computer-Human Interaction (TOCHI 2018)*, 25(6): Article 30, 40 pages.
- [21] **Vertanen, K.**, Fletcher, C. *, Gaines, D. *, Gould, J. *, Kristensson, P.O. The Impact of Word, Multiple Word, and Sentence Input on Virtual Keyboard Decoding Performance. In *Proceedings of the ACM Conference on Human Factors in Computing Systems (CHI 2018)*. Acceptance rate: 26%
- [22] Walker, J. *, Li, B. *, **Vertanen, K.**, Kuhl, S. Efficient Typing on a Visually Occluded Physical Keyboard. In *Proceedings of the ACM Conference on Human Factors in Computing Systems (CHI 2017)*, 5457-5461. Acceptance rate: 25%
- [23] **Vertanen, K.**, Memmi, H. *, Emge, J. *, Reyal, S. *, and Kristensson, P.O. VelociTap: Investigating Fast Mobile Text Entry using Sentence-Based Decoding of Touchscreen Keyboard Input. In *Proceedings of the ACM Conference on Human Factors in Computing Systems (CHI 2015)*, 659-668. **Best paper**. Acceptance rate: 23%
- [24] Kristensson, P.O. and **Vertanen, K.** The Inviscid Text Entry Rate and its Application as a Grand Goal for Mobile Text Entry. In *Proceedings of the ACM International Conference on Human-Computer Interaction with Mobile Devices and Services (MobileHCI 2014)*, 335-338. Acceptance rate: 21%

- [25] Rough, D. *, **Vertanen, K.**, and Kristensson, P.O. An Evaluation of Dasher with a High-Performance Language Model as a Gaze Communication Method. In *Proceedings of the ACM International Working Conference on Advanced Visual Interfaces (AVI 2014)*, 169-176. Acceptance rate: 28%
- [26] Weir, D. *, Pohl, H., Rogers, S., **Vertanen, K.**, and Kristensson, P.O. Uncertain Text Entry on Mobile Devices. In *Proceedings of the ACM Conference on Human Factors in Computing Systems (CHI 2014)*, 2307-2316. Acceptance rate: 23%
- [27] **Vertanen, K.** and Kristensson, P.O. Complementing Text Entry Evaluations with a Composition Task. *ACM Transactions on Computer-Human Interaction (TOCHI 2014)*, 21(2): Article 8, 33 pages.
- [28] Oulasvirta, A., Reichel, A., Li, W., Zhang, Y., Bachnynskyi, M., **Vertanen, K.**, and Kristensson, P.O. Improving Two-thumb Text Entry on Touchscreen Devices. In *Proceedings of the ACM Conference on Human Factors in Computing Systems (CHI 2013)*, 2765-2774. Acceptance rate: 20%
- [29] Trinh, H. *, Waller, A., **Vertanen, K.**, Kristensson, P.O., and Hanson, V.L. iSCAN: A Phoneme-based Predictive Communication Aid for Nonspeaking Individuals. In *Proceedings of the ACM SIGACCESS Conference on Computers and Accessibility (ASSETS 2012)*, 57-64. **Best student paper.** Acceptance rate: 28%
- [30] **Vertanen, K.** and Kristensson, P.O. Spelling as a Complementary Strategy for Speech Recognition, In *Proceedings of the International Conference on Spoken Language Processing (Interspeech 2012)*, 2291-2294. Acceptance rate: 52%
- [31] Kristensson, P.O. and **Vertanen, K.** The Potential of Dwell-Free Eye-Typing for Fast Assistive Gaze Communication. In *Proceedings of the ACM Symposium on Eye-Tracking Research and Applications (ETRA 2012)*, 241-244. **Best paper honorable mention.** Acceptance rate (short papers): 65%
- [32] Kristensson, P.O. and **Vertanen, K.** Performance Comparison of Phrase Sets and Presentation Styles for Text Entry Evaluations. In *Proceedings of the ACM International Conference on Intelligent User Interfaces (IUI 2012)*, 29-32. Acceptance rate: 23%
- [33] Kristensson, P.O. and **Vertanen, K.** Asynchronous Multimodal Text Entry using Speech and Gesture Keyboards. In *Proceedings of the International Conference on Spoken Language Processing (Interspeech 2011)*, 581-584. Acceptance rate: 58%
- [34] **Vertanen, K.** and Kristensson, P.O. The Imagination of Crowds: Conversational AAC Language Modeling using Crowdsourcing and Large Data Sources. In *Proceedings of the ACL Conference on Empirical Methods in Natural Language Processing (EMNLP 2011)*, 700-711. Acceptance rate: 23%
- [35] **Vertanen, K.** and Kristensson, P.O. A Versatile Dataset for Text Entry Evaluations Based on Genuine Mobile Emails. In *Proceedings of the ACM International Conference on Human-Computer Interaction with Mobile Devices and Services (MobileHCI 2011)*, 295-298. Acceptance rate (short papers): 18%
- [36] **Vertanen, K.** and Kristensson, P.O. Getting it Right the Second Time: Recognition of Spoken Corrections. In *Proceedings of the IEEE Workshop on Spoken Language Technology (SLT 2010)*, 277-282. Acceptance rate: 52%
- [37] **Vertanen, K.** and Kristensson, P.O. Intelligently Aiding Human-Guided Correction of Speech Recognition. In *Proceedings of the AAAI Conference on Artificial Intelligence (AAAI 2010)*, 1698-1701. Acceptance rate: 25%
- [38] **Vertanen, K.** and MacKay, D.J.C. Speech Dasher: Fast Writing using Speech and Gaze. In

Proceedings of the ACM Conference on Human Factors in Computing Systems (CHI 2010), 595-598. Acceptance rate: 22%

- [39] **Vertanen, K.** and Kristensson, P.O. Automatic Selection of Recognition Errors by Respeaking the Intended Text. In *Proceedings of the IEEE Workshop on Automatic Speech Recognition and Understanding (ASRU 2009)*, 130-135. Acceptance rate: 42%
- [40] **Vertanen, K.** and Kristensson, P.O. Recognition and Correction of Voice Web Search Queries. In *Proceedings of the International Conference on Spoken Language Processing (Interspeech 2009)*, 1863-1866. Acceptance rate: 58%
- [41] **Vertanen, K.** and Kristensson, P.O. Parakeet: A Continuous Speech Recognition System for Mobile Touch-Screen Devices. In *Proceedings of the ACM International Conference on Intelligent User Interfaces (IUI 2009)*, 237-246. Acceptance rate: 25%
- [42] **Vertanen, K.** and Kristensson, P.O. On the Benefits of Confidence Visualization in Speech Recognition. In *Proceedings of the ACM Conference on Human Factors in Computing Systems (CHI 2008)*, 1497-1500. Acceptance rate: 22%
- [43] **Vertanen, K.** Combining Open Vocabulary Recognition and Word Confusion Networks. In *Proceedings of the IEEE International Conference on Acoustics, Speech, and Signal Processing (ICAASP 2008)*, 4325-4328. Acceptance rate: 50%
- [44] **Vertanen, K.** Speech and Speech Recognition during Dictation Corrections. In *Proceedings of the International Conference on Spoken Language Processing (Interspeech 2006)*, 1890-1893. Acceptance rate: 64%
- [45] Hollermann, L., Hsu, T., Lopez, D., and **Vertanen, K.** Scheduling Problems in a Practical Allocation Model. *Journal of Combinatorial Optimization (1997)*, 129-149.

WORKSHOP, POSTER & DEMO PUBLICATIONS (PEER REVIEWED)

- [46] Memmott, T., Gaines, D.* , Lawhead, M., Klee, D., **Vertanen, K.** 2025. Simulated Online Typing Performance in a cBCI using Difference Language Models. In *Proceedings of the 11th International BCI Meeting (BCI Society 2025, to appear)*.
- [47] Frisch, B.* , **Vertanen, K.** Refining Participatory Design for AAC Users. In *Workshop on Access InContext: Futuring Accessible Prototyping Tools and (CHI 2025, workshop, to appear)*.
- [48] Gaines, D.* , **Vertanen, K.** 2023. Using a Pre-trained Neural Language Model to Make Character Predictions for Brain-Computer Interfaces. In *Proceedings of the 10th International BCI Meeting (BCI Society 2023)*.
- [49] **Vertanen, K.**, Kristensson, P.O. A Dataset of Noisy Typing on QWERTY Keyboards. In *Proceedings of the ACM International Conference on Intelligent User Interfaces (IUI 2023, open science track)*.
- [50] Nowrin, S.* , Ordóñez, P., **Vertanen, K.** Exploring Motor-impaired Programmers' Use of Speech Recognition. In *Proceedings of the ACM SIGACCESS Conference on Computers and Accessibility (ASSETS 2022, poster)*. Acceptance rate: 59%
- [51] Reynolds, J.* , Kuhl, S., **Vertanen, K.** A Comparison of Table, Wall, and Midair Mixed Reality Keyboard Locations. In *MobileHCI 2022 Workshop on Shaping Text Entry Research for 2030*.
- [52] Gaines, D.* , **Vertanen, K.** A Phrase Dataset with Difficulty Ratings Under Simulated Touchscreen Input. In *MobileHCI 2022 Workshop on Shaping Text Entry Research for 2030*.

- [53] Adhikary, J. *, Isom, M. *, **Vertanen, K.** The Impact of Number of Predictions on User Performance in a Dwell Keyboard. In *MobileHCI 2022 Workshop on Shaping Text Entry Research for 2030*.
- [54] Bonaker, N. *, Nel, E.M., **Vertanen, K.**, Broderick, T. Demonstrating Nomon: A Flexible Interface for Noisy Single-Switch Users. In *Extended Abstracts of the ACM Conference on Human Factors in Computing Systems (CHI 2022, interactivity)*. **Best demo runner-up**.
- [55] Adhikary, J. *, Watling, R. *, Fletcher, C. *, Stanage, A. *, **Vertanen, K.** Investigating Speech Recognition for Improving Predictive AAC. In *Proceedings of the Workshop on Speech and Language Processing for Assistive Technologies (SLPAT 2019, workshop)*.
- [56] **Vertanen, K.** Towards Improving Predictive AAC using Crowdsourced Dialogues and Partner Context. In *Proceedings of the ACM SIGACCESS Conference on Computers and Accessibility (ASSETS 2017, poster)*, 347-348.
- [57] **Vertanen, K.** Towards Fluid Speech-based Text Interaction. In *Extended Abstracts of the ACM Conference on Human Factors in Computing Systems (CHI 2017, workshop)*.
- [58] **Vertanen, K.**, Dunlop, M., Bi, X., Montague, K., Arif, A.S., Azenkot, S. Ubiquitous Text Interaction. In *Extended Abstracts of the ACM Conference on Human Factors in Computing Systems (CHI 2017, workshop proposal)*. Acceptance rate: 45%
- [59] **Vertanen, K.** Counting Fingers: Eyes-Free Text Entry without Touch Location. In *Extended Abstracts of the ACM Conference on Human Factors in Computing Systems (CHI 2016, workshop)*.
- [60] Walker, J. *, Kuhl, S., **Vertanen, K.** Decoder-Assisted Typing using an HMD and a Physical Keyboard. In *Extended Abstracts of the ACM Conference on Human Factors in Computing Systems (CHI 2016, workshop)*.
- [61] **Vertanen, K.**, Dunlop, M., Clawson, J., Kristensson, P.O., Arif, A.S. Inviscid Text Entry and Beyond. In *Extended Abstracts of the ACM Conference on Human Factors in Computing Systems (CHI 2016, workshop proposal)*. Acceptance rate: 45%
- [62] **Vertanen, K.** and MacKay, D.J.C. Speech Dasher: A Demonstration of Text Input Using Speech and Approximate Pointing. In *Proceedings of the ACM SIGACCESS Conference on Computers and Accessibility (ASSETS 2014, demo)*, 353-354.
- [63] Trinh, H., Waller, A., **Vertanen, K.**, Kristensson, P.O., and Hanson, V.L. Phoneme-based Predictive Text Entry Interface. In *Proceedings of the ACM SIGACCESS Conference on Computers and Accessibility (ASSETS 2014, demo)*, 351-352.
- [64] **Vertanen, K.**, Emge, J. *, Memmi, H. *, and Kristensson, P.O. Text Blaster: A Multi-Player Touchscreen Typing Game. In *Extended Abstracts of the ACM Conference on Human Factors in Computing Systems (CHI 2014, demo)*, 379-382.
- [65] Clawson, J., Brewster, S., Dunlop, M., Kristensson, P.O., Isokoski, P., Oulasvirta, A., **Vertanen, K.**, and Waller A. The Usability of Text Entry Systems Now and in the Future. In *Extended Abstracts of the ACM Conference on Human Factors in Computing Systems (CHI 2014, special interest group proposal)*, 1139-1142.
- [66] **Vertanen, K.**, Memmi, H. *, and Kristensson, P.O. The Feasibility of Eyes-Free Touchscreen Keyboard Typing. In *Proceedings of the ACM SIGACCESS Conference on Computers and Accessibility (ASSETS 2013, poster)*, Article No. 69. Acceptance rate: 60%
- [67] **Vertanen, K.** A Collection of Conversational AAC-like Communications. In *Proceedings of the ACM SIGACCESS Conference on Computers and Accessibility (ASSETS 2013, poster)*, Article No. 31.

Acceptance rate: 60%

- [68] Reyal, S. *, **Vertanen, K.**, and Kristensson, P.O. Developing Efficient Text Entry Methods for the Sinhalese Language. In *Extended Abstracts of the ACM Conference on Human Factors in Computing Systems (CHI 2013, workshop proposal)*.
- [69] Kristensson, P.O., Brewster, S., Clawson, J., Dunlop, M., Findlater, L., Isokoski, P., Martin, B., Oulasvirta, A., **Vertanen, K.**, and Waller, A. Grand Challenges in Text Entry. In *Extended Abstracts of the ACM Conference on Human Factors in Computing Systems (CHI 2013, workshop)*, 3315-3318. Acceptance rate: 40%
- [70] Trinh, H. *, Waller, A., **Vertanen, K.**, Kristensson, P.O., and Hanson, V.L. Applying Prediction Techniques to Phoneme-based AAC Systems. In *Proceedings of the Workshop on Speech and Language Processing for Assistive Technologies (SLPAT 2012)*, 19-27. Acceptance rate: 62%
- [71] Kristensson, P.O., Clawson, J., Dunlop, M., Isokoski, P., Roark, B., **Vertanen, K.**, Waller, A., and Wobbrock, J. Designing and Evaluating Text Entry Methods. In *Extended Abstracts of the ACM Conference on Human Factors in Computing Systems (CHI 2012, workshop proposal)*, 2747-2750. Acceptance rate: 62%
- [72] **Vertanen, K.** and Kristensson, P.O. Parakeet: A Demonstration of Speech Recognition on a Mobile Touch-Screen Device. In *Proceedings of the ACM International Conference on Intelligent User Interfaces (IUI 2009, demo)*, 483-484.

BOOK CHAPTERS

- [1] Gaines, D. *, Dudley, J., Kristensson, P.O., **Vertanen, K.** Statistical Keyboard Decoding. In *Bayesian Methods for Interaction and Design (2022)*, 188-211.
- [2] **Vertanen, K.** Probabilistic Text Entry—Case Study 3. In *Intelligent Computing for Interactive System Design: Statistics, Digital Signal Processing, and Machine Learning in Practice (2021)*, 277–320.

THESES

- [3] **Vertanen, K.** Efficient Correction Interfaces for Speech Recognition. Ph.D. thesis (2009), University of Cambridge.
- [4] **Vertanen, K.** Efficient Computer Interfaces using Continuous Gestures, Language Models, and Speech. M.Phil thesis (2004), University of Cambridge.
- [5] **Vertanen, K.** A Parallel Implementation of a Fluid Flow Simulation using Smoothed Particle Hydrodynamics. Master's thesis (1999), Oregon State University.

TECH REPORTS AND PREPRINTS (NOT PEER REVIEWED)

- [6] **Vertanen, K.** Baseline WSJ Acoustic Models for HTK and Sphinx: Training Recipes and Recognition Experiments. Technical report (2006), Cavendish Laboratory.

GRANTS

- NSF (IIS 2402876): Collaborative Research: HCC: Medium: Enhancing Communication and Interaction for Individuals with Severe Disabilities: A Novel Interface Leveraging Multiple Information Sources, PI, \$1.2M total (MTU share \$457K).
- Meta research gift (2024), sole PI, \$50K.

- NIH (DC009834): Optimizing BCI-FIT: Brain Computer Interface - Functional Implementation Toolkit (2024), subcontractor, MTU share \$129K.
- Meta research gift (2022), sole PI, \$25K.
- Google Faculty Research Award: User Model Adaptation for Improved Touchscreen Typing (2022), sole PI, \$60K.
- NSF (IIS 1909089): CHS: Small: Rich Surface Interaction for Augmented Environments (2019), PI, \$515K.
- NSF (IIS 1909248): CHS: Small: Collaborative Research: Improving Mobile Device Input for Users Who are Blind or Low Vision (2019), PI, \$500K total (MTU share \$226K).
- NSF (IIS 1750193): CAREER: Technology Assisted Conversations (2018), sole PI, \$539K.
- Michigan Tech Research Excellence Fund (REF): Automatic Speech Recognition using Deep Neural Networks (2018), sole PI, \$45K.
- Michigan Tech Institute of Computing and Cybersystems, Paul William Seed Grant: Sensing and Feedback for On-Body Input (2018), PI, \$44K.
- Google Faculty Research Award: Less is More: Investigating Abbreviated Text Input via a Game (2016), sole PI, \$47K.
- Montana Tech High Performance Computing Seed Grant (2013), sole PI, \$5K.
- Montana Tech New Faculty Seed Grant (2012), sole PI, \$5K.
- Nokia Corporation: Creating Enjoyable and Fluid Mobile Phone Touch-Screen Interfaces (2009), co-PI, \$18K.
- Nokia Corporation: A Mobile Speech Recognition Correction Interface (2006), sole PI, \$10K.
- University of Cambridge, Clerk Maxwell Scholarship (2004), \$120K.
- Overseas Research Student Award (2004), \$40K.
- University of Minnesota, Katherine E. Sullivan Scholarship, \$14K.

MENTORING EXPERIENCE

- PhD advisor (3 graduated, 2 in-progress), Michigan Tech (2016-present).
- Undergraduate research advisor (11 undergraduate students), Michigan Tech (2016-present).
- PhD co-advisor (1 student), University of St Andrews (2012-18).
- Undergraduate research advisor (3 undergraduate students), Montana Tech (2013).
- Undergraduate research advisor (1 undergraduate student), Princeton University (2010-11).

INDUSTRY EXPERIENCE

Software Consultant, Wildfire Communications, 2002-2003.

Designed and built new features for Wildfire's voice-driven virtual assistant.

Software Engineer, etrieve, Inc., 1999-2002.

Lead designer of voice application for mobile access to email, contact, and calendar information.

- Team leader of the voice application group, including developing and instituting best practices.
- Responsible for reviewing the usability of etrieve's voice, web, and mobile device interfaces.
- Designed the dialog flow, prompts and grammars for the voice application.
- Created hardware and software architecture for scalable and high availability 24x7 service.

Computer Specialist, In Time, 1990-2016.

Responsible for computing and web publishing tasks within the company.

ACADEMIC SERVICE

Associate editor:

- International Journal of Human Computer Studies (2014-2019)

Subcommittee chair:

- CHI: ACM International Conference on Human Factors in Computing Systems (2020, 2021)

Associate chair:

- CHI: ACM International Conference on Human Factors in Computing Systems (2017, 2018, 2019)
- IUI: International Conference on Intelligent User Interfaces (2015)
- MobileHCI: ACM International Conference on Human-Computer Interaction with Mobile Devices and Services (2014)

Doctoral consortium co-chair:

- ASSETS: ACM SIGACCESS Conference on Computers and Accessibility (2018)

Vice-president:

- SIG-SLPAT, Special Interest Group, Speech and Language Processing for Assistive Technologies (2015-16)

Program committee:

- ASSETS: ACM SIGACCESS Conference on Computers and Accessibility (2018, 2019, 2020, 2025)
- IUI: International Conference on Intelligent User Interfaces (2014)
- SLPAT: Workshop on Speech and Language Processing for Assistive Technologies (2012, 2013, 2019)
- MobileHCI: ACM International Conference on Human-Computer Interaction with Mobile Devices and Services (2011)
- CHI Workshop on Text Entry (2012, 2013, 2016, 2017)
- BCS-HCI: British Computer Society Conference on Human-Computer Interaction (2010)

Workshop organizer:

- 11th Annual International BCI Meeting, Personalization of Communication BCIs (2025)
- 10th Annual International BCI Meeting, Examining Alternative Keyboards and Language Modeling Software for Message Generation by BCI End-users (2023)

Student research competition judge:

- ASSETS: ACM SIGACCESS Conference on Computers and Accessibility (2014)

Summer school instructor:

- ACM SIGCHI Summer School: Write a Paper for CHI 2021, IIT Bombay (2019)
- ACM SIGCHI Summer School: Computational Interaction, University of Cambridge (2018)
- ACM SIGCHI Summer School: Research Methods and Approaches to Text Entry and Other

Interaction Techniques, IIT Bombay (2018)

Reviewer:

- NSF CISE panelist (8 total panels; 2018: 1 panel, 2019: 1 panel, 2020: 2 panels, 2021: 2 panels, 2022: 1 panel, 2025: 1 panel)
- NSF CISE ad hoc reviewer (2024)
- TOCHI: ACM Transactions on Computer-Human Interaction (2017, 2018, 2019, 2021, 2023)
- International Journal of Human Computer Studies (2016)
- IEEE Transactions on Human-Machine Systems (2015, 2025)
- IEEE Pervasive Computing (2017)
- Computer Speech and Language (2012)
- Transactions on Visualization and Computer Graphics (2020)
- International Journal of Human-Computer Interaction (2025)
- ACL Rolling Review (Feb. 2025)
- CHI: ACM International Conference on Human Factors in Computing Systems (2010, 2011, 2012, 2013, 2014, 2015, 2016, 2022, 2025)
- ISMAR: International Symposium on Mixed and Augmented Reality (2024)
- IUI: International Conference on Intelligent User Interfaces (2012, 2013, 2017)
- UIST: ACM Symposium on User Interface Software and Technology (2012, 2013, 2016, 2017, 2020)
- MobileHCI: ACM International Conference on Human-Computer Interaction with Mobile Devices and Services (2013, 2015, 2016, 2017)
- IEEEVR: IEEE Conference on Virtual Reality and 3D User Interfaces (2020, 2021)
- SLPAT: Workshop on Speech and Language Processing for Assistive Technologies (2022)
- NordiCHI: Nordic Conference on Human-Computer Interaction (2012)
- ICASSP: IEEE International Conference on Acoustics, Speech, and Signal Processing (2011)
- ICMI: ACM International Conference on Multimodal Interaction (2013)
- BCS-HCI: British Computer Society Conference on Human Computer Interaction (2009)

INVITED & CONFERENCE TALKS

Language Modeling and Predictive Text Entry for AAC
International Society for Augmentative and Alternative Communication (ISAAC), August 2021.

VelociWatch: Designing and Evaluating a Virtual Keyboard for the Input of Challenging Text
CHI '19: ACM International Conference on Human Factors in Computing Systems, May 2019.

The Impact of Word, Multiple Word, and Sentence Input on Virtual Keyboard Decoding Performance
CHI '18: ACM International Conference on Human Factors in Computing Systems, April 2018.

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