DAVID MARTIN

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EDUCATION

Georgia Institute of Technology   *Jan. 2019 - May 2025*
Bachelor of Computer Science, Research Option   *Research Advisor: Thad Starner*
Threads: People and Intelligence

EXPERIENCE

Present - 2021

Georgia Institute of Technology, *Undergraduate Researcher*

- Created the worlds largest American Sign Language **(ASL)** vocabulary dataset with over 210,000 examples from 50+ signers in collaboration with Google CoreML, the National Technical Institute of the Deaf **(NTID)**, and Deaf Professional Arts Network **(DPAN)**
- Collected and trained on fingerspelling data using an array of smart rings for text-entry, achieving 91% character accuracy and 89% word accuracy
- Prototyped head-worn display **(HWD)** caption emulation system using SDL and Android

Summer 2024

NVIDIA, *Technical Project Manager Intern*

- Consulted on the integration of Sign Language Recognition into NVIDIA products
- Wrote Product Requirement Document for online ASL learning platform
- Determine practical and achievable SLR tasks in collaboration with the Deaf community
- Advised on the ethical and cultural considerations to be taken moving forward
- Set up relationships and collaborations between NVIDIA, university and organization research labs, and Deaf organizations

Summer 2022

Microsoft Research, *Undergraduate Research Intern*

- Developed and analyzed novel hierarchical linguistics feature sets for ASL-to-English dictionaries and demonstrated human-centric usability improvements to query system with minimal algorithmic loss in query accuracy
- Presented findings to MSR researchers at the end of internship

2021

Georgia Institute of Technology, *Undergraduate Researcher*

- Developed a prototype low-cost hearing diagnostic application using React-Native
- Developed code for Bluetooth connection between smartphone and low-cost hearing aid
- Managed a team of 4 software engineers and facilitated multi-institutional collaboration

Summer 2019

Rochester Institute of Technology, *Undergraduate Researcher*

- Part of the *Summer Undergraduate Research for Students who are Deaf or Hard-of-Hearing in Applying Mathematical and Statistical Methods to Problems from the Sciences*
- Investigated Zero Forcing and Failed Zero Forcing sets of graphs and their properties
- Presented findings at RIT Undergraduate Research Symposium

PUBLICATIONS

2024 | *In review.*
Martin, D. and Bhardwaj, K. et al., 2024.
PopSignAI: Using Sign Language Recognition to Improve American Sign Language Learning in Novice Signers.
Submitted to Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies (IMWUT)

Kang, J., Layton, E., **Martin, D.**, and Starner, T., 2024.
Towards Improving Real-Time Head-Worn Display Caption Mediated Conversations with Speaker Feedback for Hearing Conversation Partners
In Extended Abstracts of the 2024 CHI Conference on Human Factors in Computing Systems (CHI EA '24)

2023 | Starner, T. et al., 2023.
PopSign ASL v1.0: An Isolated American Sign Language Dataset Collected via Smartphones.
Thirty-seventh Conference on Neural Information Processing Systems (NeurIPS '23).

Martin, D. and Leng, Z. et al., 2023.
FingerSpeller: Camera-Free Text Entry Using Smart Rings for American Sign Language Fingerspelling Recognition.
In Proceedings of the 25st International ACM SIGACCESS Conference on Computers and Accessibility (ASSETS '23).

Feng, P., **Martin, D.** and Starner, T., 2023.
ToozKit: System for Experimenting with Captions on a Head-Worn Display.
Adjunct Proceedings of the 2023 ACM International Joint Conference on Pervasive and Ubiquitous Computing & the 2023 ACM International Symposium on Wearable Computing (UbiComp/ISWC '23).

2022 | Britain, G., **Martin, D.,** Kwok, T., Sumilong, A. and Starner, T., 2022.
Preferences for Captioning on Emulated Head Worn Displays While in Group Conversation.
Proceedings of the 2022 ACM International Symposium on Wearable Computers (ISWC '22).

PROJECTS

Present - 2021 | **PopsignAI** 🔗
Contextual Computing Group, Georgia Institute of Technology
- Designed pipeline for annotation of 210,000 examples of signs from 50+ signers
- Consulted 13 researchers and volunteers on socio-linguistic and cultural factors
- Designed and conducted user studies with novice signers to research if learning outcomes for receptive and generative language skills are improved by in-game sign language recognition

Present - 2021 | **Caption on Glass**
Contextual Computing Group, Georgia Institute of Technology
- Prototyped emulation system to investigate optimal field-of-view, font size, resolution and clarity, and text off-set for captioning access in small group conversation
- Designed and conducted user studies with Deaf and Hard-of-hearing participants
- Co-designed a low-weight, low-power, captioning system on the Tooz HWD for researchers and early adopters to begin using and testing everyday HWD for language access

- Advised and assisted in the design and execution of a user study investigating conversational improvements for both hearing and Deaf and Hard-of-Hearing speaking partners
- Designed and conducted user study researching captioning device preferences (smartphone and HWD) in various everyday tasks

Contextual Computing Group, Georgia Institute of Technology

- Led and presented exhibition of HWD emulator demonstrating how field-of-view differences affect experiences in captioned small group conversations
- Co-organized 7 exhibitions demonstrating areas of interest for HWD research at ISWC 2022

2020 | **LoCHAid: Low Cost Hearing Aid** 🔗
Frugal Engineering Lab, Georgia Institute of Technology

- Developed mobile application to pair with low-cost hearing aid prototype, facilitate hearing screenings, and perform audiological mapping to hearing-aid prototype

SKILLS

Languages
Python, Java, JavaScript, Kotlin, Swift, C/C++, MATLAB

Platforms and Tools
Android, iOS, Web, React Native, React.JS, Next.JS, OpenGL, GIT, SKlearn, Plotly, Pandas, LaTex, SDL

Other Skills
Experimental Design, Statistical Analysis, Data Visualization, IRB Protocol Writing, Grant Writing, Program Management