Vivian Shen

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OVERVIEW

I am a CS PhD student in the Robotics Institute at Carnegie Mellon University, advised by Chris Harrison in the Human Computer Interaction Institute. I work with sensors and computer vision, applied to the domains of sustainability and input / output technologies. My work has received two Best Paper awards, Honorable Mentions from NSF GRFP and Fast Co. Design Awards, and been highlighted on publications such as NBC and Popular Science.

EDUCATION

Carnegie Mellon University, School of Computer Science — Started 2020
Ph.D. in Robotics
Future Interfaces Group. Advisor: *Chris Harrison*

Columbia University — 2019
B.S. Computer Science
Minor Mechanical Engineering

PEER-REVIEWED PUBLICATIONS

[5] **Shen. V.** and Harrison, C. 2022. Pull Gestures with Coordinated Graphics on Dual Touchscreen Devices. To appear in the Proceedings of *2022 ACM International Conference on Multimodal Interaction*.

[4] **Shen. V.**, Shultz C., and Harrison, C. 2022. Mouth Haptics in VR using a Headset Ultrasound Phased Array. *2022 ACM CHI Conference on Human Factors in Computing Systems.* **Best Paper Award (Top 1%).**

[3] Ahuja, K., **Shen. V.**, Fang, C., Riopelle, N., Kong, A., and Harrison, C. 2022. ControllerPose: Inside-Out Body Capture with VR Controller Cameras. *2022 ACM CHI Conference on Human Factors in Computing Systems.*

[2] **Shen, V.,** Spann, J., and Harrison, C. 2021. FarOut: Extending the Range of ad hoc Touch Sensing with Depth Cameras. *2021 ACM Symposium on Spatial User Interaction*. **Best Paper Award (Top 2%).**

[1] Rudranarayan, M., Abcouwer, N., Brinkman, A., Chamberlain-Simon, B., Dolci, M., Emanuel, B., Gross, J., Jones, L. Kim, J., Mayo, J., Ohta, P., Sanigepalli, S., **Shen, V.**, Smith, R., Ubellacker, W., and Wehage, K. 2018. Testbeds and Technologies for potential Mars orbital sample capture and manipulation. *IEEE Aerospace Conference*.

PROFESSIONAL EXPERIENCE

Meta Reality Labs — Summer 2022
Research Scientist Intern. Worked with gaze tracking with the Input Explorations team, formerly CTRL Labs.

Walt Disney Imagineering — Spring 2020
Control Systems Intern. Worked on full-stack GUI integration for a HUD on an in-park ride system.

Conservation X Labs — Fall 2019
Product Intern. Lead software developer working on edge artificial intelligence frameworks and embedded systems products for conservation purposes.

San Diego Zoo Global — Fall 2019
Embedded Systems Volunteer. Research on a computer vision system for autonomous animal monitoring.

Disney Research — Summer - Fall 2018
Research Lab Associate. Research on software for a hybrid RF and computer vision system.

NASA Jet Propulsion Lab — Summer 2017
Robotics Research Fellow. Designed and implemented an embedded mechanism on a Mars orbiter.

Creative Machines Lab @ Columbia Winter 2016 - Spring 2018
Undergraduate Researcher. Designed, built, and implemented the nozzle system of a food 3D printer.

AWARDS AND HONORS

Fast Company Design Awards: Experimental and Student Honorable Mentions	2022
NSF GRFP Honorable Mention	2022
James R. Swartz Entrepreneurial Fellow	2020
Microsoft Diversity Scholar	2018
Facebook f8 Hackathon Fellow	2018
Ada Lovelace Fellow	2017

SKILLS

Python, C/C++, C#, HTML, CSS, Javascript, Matlab
ROS, CAD, Unity, Embedded Systems, UNIX/LINUX
Adobe Creative Suite, Microsoft Office Suite, Github, JIRA
English, Chinese

INVITED TALKS AND PRESENTATIONS

Touchless Consortium and CrowdHelix, Research Seminar. Mouth Haptics.	2022
New York AR Group. Mouth Haptics.	2022
CodeDay Labs. "The Hows and Whys of a PhD."	2021, 2022
CodeDay Labs. "The Road to Robotics Research."	2020

LEADERSHIP

Pinnacle Hackathon Organizer	2021
Woodenfish Monastic Program President	2019
CodePhil NonProfit Coordinator	2018
DevFest Hackathon Organizer	2016-2018
CodeDay Regional Manager	2016-2017

PAPER REVIEWING

ACM CHI	2022
ACM MobileHCI	2022

ACADEMIC SERVICE

Graduate Applicant Support Program Mentor	2021

TEACHING EXPERIENCE

Computer Networks, Head TA	2018
Codecademy Programming Advisor	2016

SELECTED PRESS COVERAGE

NBC. "Into the Metaverse: what does the future of virtual reality feel like?"
Popular Science. "This VR Accessory is designed to make your mouth feel stuff."
Daily Beast. "VR Device Lets Gamers Feel Water Fountains, Mud Splatter, and Crawling Bugs on their Lips."

Tech Crunch. "Finally, VR for your mouth."
CNET. "Researchers Create VR Headset That Sends Sensations to the Mouth, Lips, and Tongue."
Popular Mechanics. "New VR Tech Lets You Feel Spiders Crawl Across Your Lips…"
IGN. "Scientists Invent Mouth Haptics for VR, Including Water, Wind, and… Spiders."
The Science Times. "Experience Spiders Crawling On Your Mouth the VR Way with this Gadget."
RoadToVR. "Researchers Show Full-body VR Tracking with Controller-mounted Cameras."
VR Times. "Researchers Demonstrate Body Tracking via Modded VR Controllers in Meta Quest 2."
UploadVR. "Researchers Demonstrate Body Tracking From Cameras On VR Controllers."

HACKATHON PROJECTS

Capitol360 - Microsoft Prize — June 2018
SmartTrax. Flask web app that uses sentiment analysis to create a soundtrack for a story.

Vhacks - 3rd place — March 2018
Xperience. VR live streaming pen pal app, social inclusion category of the premier Vatican City hackathon.

HackMIT - Top 10 — Sept 2017
SmartBike. An embedded systems/computer vision kit to add functionality to an average bike.

PennApps - 2nd Place — Jan 2017
PianoGlove. A wearable glove that uses ultrasonic range finding to emulate an invisible piano.

INTERESTS

Ultimate Frisbee • Wildlife Photography • Fabrication • Hackathons • Digital Art • Glass blowing

REFERENCES

Chris Harrison - Advisor, Carnegie Mellon University
Brian Tsang - Apple
Jota Costa - Meta Reality Labs
Rahul Arora - Meta Reality Labs
Jason Reisman - Meta Reality Labs
Ian Ingram - Institute of Conservation Research
Jack Yang - Samsung Research