Nhan Tran

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Education

- **Cornell University** *August 2022 - Current*
  - Ph.D., **Computer Science** (4.1/4.0 GPA). Adviser: Abe Davis.
  - Research Interests: extended reality (AR/VR), human-robot interaction, and healthcare
- **Colorado School of Mines** *August 2014 - May 2020*
  - M.S. and B.S., **Computer Science + Robotics and Intelligent Systems** (3.9/4.0 GPA)
  - Masters Thesis: *Exploring Mixed Reality Robot Communication Under Different Types of Mental Workload*

Research experience

- **Cornell University** *Graduate Research Assistant, August 2022 - Current*
  - Researching augmented reality-guided 3D capture with Prof Abe Davis. Developed a mobile GPU pipeline and co-designing augmented reality guidance for recapturing human body parts across various environments.
  - Conducting user studies to evaluate the effectiveness of different 3D capture guidance strategies for augmented reality systems in remote healthcare monitoring.
- **Robust AI** *Research Intern, June 2020 - September 2020*
  - Prototyped augmented reality and human-robot interaction with Alex Trevor and Crystal Chao (NDA).
- **Mines Interactive Robotics Research Lab** *Research Assistant and Project Lead, 2017 - 2020*
  - Researched adaptive robot-human communication: how human mental workload is affected by or in turn affects mixed reality robot gestures. Advised by Dr. Tom Williams.

Work experience (selected)

- **Robust AI** *Software Engineer, Robot Perception, June 2020 - August 2022*
  - Developed robot perception systems (obstacle avoidance, object detection, monocular depth estimation model).
  - Built simulation and visualization tools that allow rapid iteration of robotic development and sensor inspection.
- **Facebook** *Production Engineer Intern, May 2019 - August 2019*
  - Saved team from capacity overloads by building automation tools that analyze historical data and control the sampling rates of machine learning experiments. Received a return full-time offer.
- **NASA-Caltech Jet Propulsion Laboratory** *Software Intern (Web/Full-stack), June 2018 - August 2018*
  - Researched and resolved bottlenecks in Mars 2020 Rover's Sampling and Caching Subsystem's cleaning process.
  - Reduced 50% lead time by designing an assembly tracking system to optimize operations workflows.
- **Google Nest** *Software Engineering Intern, May 2017 - August 2017*
  - Reduced man-hours by 90% by developing a visualization tool for internal robots to automate product testing.

Teaching experience and Leadership

- **Cornell University** *Graduate Teaching Assistant, Fall 2022, Spring 2023*
  - Spring 2023: CS4670 Computer Vision with 350+ students.
  - Fall 2022: CS2110 Data Structures, one of Cornell's largest computer science courses with 700+ students.

Awards

- **XR for Inclusion Prize and Grand Prize Finalists** (2022, MIT Reality Hack, world's largest AR/VR hackathon)
- **Human-Robot Interaction Pioneers** (2020, highly selective cohort of rising stars in the HRI field)
- **Graduate Student Research and Teaching Fellowships** (2018-2020, masters' degree fully funded at Mines)
- **Outstanding Undergraduate Researcher** (2018, awarded by Department of Computer Science at Mines)
- **Greenhouse Scholars** (2014, awarded for excellent community leadership and involvement)
- **Daniels Scholars** (2014, full-ride merit scholarship)
- **AR/VR Grand Prize @ Stanford University Hackathon** (2020, awarded to best overall AR/VR project)
- **Best AR/VR Project For Community Building @ Yale Hackathon** (2019, prize sponsored by Facebook)
- **Top 10 project and Calhacks Fellowship @ UC Berkeley Hackathon** (2018)
- **First Place @ LinkedIn Intern Hackathon** (2017, awarded $10,000).
- **US Grand prizes and Top 10 / 129 in Google's Young Makers competition** (2018)

Publications

- **Nhan Tran**, Trevor Grant, Thao Phung, Leanne Hirshfield, Christopher Wickens, Tom Williams. *Now Look Here! Mixed Reality Improves Robot Communication Without Cognitive Overload.* HCI International 2023.
- Landon Brown, Jared Hamilton, Zhao Han, Albert Phan, Thao Phung, Eric Hansen, **Nhan Tran**, Tom Williams. *Best of Both Worlds? Combining Different Forms of Mixed Reality Deictic Gestures.* ACM Transactions on Human-Robot Interaction 2022.
- Jared Hamilton and Thao Phung and **Nhan Tran** and Tom Williams. *What's The Point? Tradeoffs Between Effectiveness and Social Perception When Using Mixed Reality to Enhance Gesturally Limited Robots.* HRI 2021.
- Jared Hamilton and **Nhan Tran** and Tom Williams. *Tradeoffs Between Effectiveness and Social Perception When Using Mixed Reality to Supplement Gesturally Limited Robots.* VAM-HRI 2020.
- Tom Williams and Matthew Bussing and Sebastian Cabrol and Elizabeth Boyle and **Nhan Tran**. *Mixed Reality Deictic Gesture for Multi-Modal Robot Communication.* HRI 2019.
- Tom Williams, **Nhan Tran**, Josh Rands, Neil T. Dantam . *Augmented, Mixed, and Virtual Reality Enabling of Robot Deixis.* VAMR 2018.

Service and other activities

- Reviewer, ACM/IEEE International Conference on Human-Robot Interaction (2021, 2022)
- Web chair, ACM/IEEE International Conference on Human-Robot Interaction (2021)
- Publicity chair, Human-Robot Interaction Pioneers Workshop at HRI 2021 (2021)
- Scholarship reviewer, Greenhouse Scholars (2020)
- Student Outreach Workshop organizer, AAAI Conference on Artificial Intelligence (2018, 2019)

Projects (selected)

- **"People Following' Hospital Robot** *2023*
  - Designed and built a robot as part of a team project for the Mobile Human-Robot Interaction graduate course. The robot, repurposed from a medical cart and a hoverboard, follows healthcare workers autonomously, aiding in the transportation of medical supplies and reducing manual labor. *youtube.com/shorts/8DgEADBXTwM*

- **MelodyMesh** *2023*
  - A 3D music visualizer built with a 4-person team that employs STFT for frequency analysis of music. By mapping these frequencies onto spherical harmonics and Legendre polynomials, we provide an interactive way to experience sound through real-time 3D mesh transformations. *youtu.be/tZ67UvLzx2w*
- **World GPT** *2023*
  - A Unity virtual world built in 6 hours with a 5-person team, implementing interactive AI characters that utilize OpenAI's GPT-3 to simulate memories, have unscripted conversations, and demonstrate emergent interactions between agents. *youtu.be/5DcABeOltL8*
- **Mixed Reality Interface for Hospital Robots** *2023*
  - An AR interface that enables healthcare workers with no prior robotics experience to use natural and hands-free gestures to interact with hospital delivery robots, freeing up more time for patient care. *bit.ly/hospital-robot*
- **Inclusive User Testing in VR** *2022*
  - A Unity plugin that enables user testers to directly give feedback in multiple, accessible VR input sources (i.e., voice, keyboard) and allows researchers to view this feedback and other metrics in real time. *bit.ly/vr_user_testing*
- **HoloLens Pill Tracker** *2020*
  - An embodied AR agent that helps users find medication indoors *github.com/megatran/HoloLens_Pill_Tracker*
- **Wall-Z Robot** *2018*
  - A functional prototype of the Wall-E inspired robot capable of gesture recognition and VR teleoperation; team project at NVIDIA Jetson Developer Challenge *www.trannhan.com/project/jetson2018/*

Skills

- **Technical**
  - Computer Graphics: AR/VR, Unity3D, Metal and GLSL Shaders, Visualization and Simulation
  - Robotics: Robot Learning, Robot Operating System (ROS2 C++ and Python), Computer Vision (OpenCV, Point Cloud Library PCL, Object Tracking and Recognition)
  - Others: PyTorch, Docker, protocol buffers, gRPC, WebSocket
- **Programming**
  - Swift (iOS), Python, C++, C#, JavaScript,
- **Languages**
  - Bilingual in Vietnamese and English
- **Design**
  - Human-Computer Interaction fundamentals, UI/UX Design, Photoshop, After Effects, Premiere, Figma