

Guilin Hu

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EDUCATION

Cornell University, College of Arts and Sciences

Ithaca, New York

B.A. Computer Science

Expected May 2024

• **GPA:** 3.85/4.00

RESEARCH EXPERIENCE

Undergraduate Student Researcher

Ithaca, New York

Cornell University Smart Computer Interfaces for Future Interactions (SciFi) Lab

Feb 2022-Present

Advisors: Prof. Cheng Zhang and Prof. François Guimbretière

• **Eye Blinking Detection**

- Co-led a research project utilizing CNNs to detect eye blinks via FMCW signals using miniature speaker and microphone mounted on eyeglass frame
- Architected a data labeling pipeline for eye blink annotation that halved the time of manual data labeling; labeled 7000+ eye blink instances across 8+ hours of videos recorded from our user study involving 15 diverse participants

• **Ring-a-Pose: Continuous Hand Pose-to-Pose Tracking**

- Explored a ring form factor for continuously tracking pose-to-pose hand gestures in real time using ultrasonic signals; achieved average MPJPE of 10.3mm and 99.27% accuracy for classifying 7-class microgestures
- Implemented and extensively investigated the performance difference of various machine learning architectures, including CNN + ResNet, LSTM, GRU, and Transformer under different amount of data; experimented data augmentation including time masking, random vertical shift, time reversing etc.

• **C-auth: Authentication with Facial Contour Lines**

- Pioneered a novel approach of user authentication using the egocentric view of facial contour lines captured by an RGB camera; achieved true positive rate of 98.0% and false positive rate of 4.97%
- Implemented a U-Net architecture model incorporating data augmentation for segmenting facial contour line from various backgrounds; achieved IoU of 97.11%

• **Pose-Sonic: Continuous Upper Body Pose Tracking**

- Developed an eyeglass frame for continuous upper body pose tracking using FMCW acoustic signal; achieved average MPJPE of 6.17cm in lab and 14.1cm in semi-in-the-wild settings

PUBLICATIONS

• Hyunchul Lim, **Guilin Hu**, Richard Jin, Hao Chen, Ryan Mao, Ruidong Zhang, Cheng Zhang. C-Auth: Exploring the Feasibility of Using Egocentric View of Face Contour for User Authentication on Glasses.

Proceedings of the 27th Annual International Symposium on Wearable Computers (ISWC' 23),

<https://doi.org/10.1145/3594738.3611355>

• Saif Mahmud, Ke Li, **Guilin Hu**, Hao Chen, Richard Jin, Ruidong Zhang, Francois Guimbretiere, Cheng

Zhang. PoseSonic: 3D Upper Body Pose Estimation Through Egocentric Acoustic Sensing on Smartglasses. **Proceedings of the Association for Computing Machinery on Interactive, Mobile, Wearable and Ubiquitous Technologies (IMWUT)/UbiComp' 23**, <https://doi.org/10.1145/3610895>

• Tianhong Yu, **Guilin Hu**, Ruidong Zhang, Hyunchul Lim, Saif Mahmud, Chi-Jung Lee, Ke Li, Devansh Agarwal, Shuyang Nie, Jinseok Oh, Francois Guimbretiere, Cheng Zhang. **Proceedings of the 2024 CHI Conference on Human Factors in Computing Systems (CHI' 24)**, *Under Review*

AWARDS & HONORS

Cornell University Summer Experience Grant *May 2022 & June 2023*

Award conferred upon top Cornell University students to offer financial support for summer research

Cornell University Dean's List *Fall 2020 & Fall 2021 & Spring 2022 & Fall 2022 & Spring 2023*

Honor presented each semester for students achieving exemplary academic records

British Physics Olympiad Top Gold Award *Nov 2018*

*Award conferred to contestants ranking **Global Top 100***

American Physics Bowl Competition (2018) Global Top 100 *May 2018*

*Award conferred to contestants ranking **Global Top 100***

LEADERSHIP

VP of Internal Affairs, ASCEND Cornell Chapter *Dec 2021 - Dec 2022*

- Organizes and designs new member training and stock pitch events for 12+ members per semester
- Responsible for recruitment and fund-raising communications

SKILLS & INTERESTS

- **Skills:** Python • Reinforcement Learning • Keras • Pytorch • TensorFlow • Numpy • SQL • Java
- **Interests:** Plane Spotting (Go to the airport and watch airplanes) • Landscape Photography • Mountain Biking • Table Tennis

LANGUAGES

- Chinese (Native)
- English (Fluent)
- French (Fluent)