Dan Zhang

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Research Interests — My expertise lies in Human-AI interaction, data science and accessibility, with a primary focus on intelligent text entry techniques. I am dedicated to developing AI systems that enhance usability and promote inclusivity in digital environments.

Education

Doctor of Philosophy (Ph.D.), Computer Science — **Sep. 2019 - present**
Stony Brook University, NY, USA (Expected graduation Dec. 2025) — *GPA: 3.8/4.0*

Master of Science (M.S.), Computer Science — **Sep. 2014 - May 2017**
Stony Brook University (SUNY Korea Campus), Incheon, South Korea — *GPA: 3.8/4.0*

Bachelor of Engineering (B.Eng.), Computer Science and Technology — **Sep. 2010 - May 2014**
University of Electronic Science and Technology of China (UESTC), Sichuan, China — *GPA: 3.5/4.0*

Skills

Domains Software Development, Mobile Development, Full Stack Web Development, HCI, Machine Learning, Deep Learning, Reinforcement Learning, LLM, Data Science

Frameworks PyTorch, Keras, Hugging Face
Languages Python, Java, Swift, Javascript, C#, C++, SQL
Tools VS Code, Android Studio, Xcode, Unity, Pycharm, Git, R Studio, Matlab, Latex

Projects

Large Language Model Mobile Text Input — **Mar. 2025 – Present**
- Developed a system-wide on-screen keyboard for Android.
- Incorporated an LLM (FLAN-T5) into the on-device keyboard.

Games for Clearflow Keyboard — **Sep. 2024 – Feb. 2025**
- Developed an App, Clearflow Games, with Unity for both iOS and Android.
- This app has mobile games for learning ClearFlow keyboard, which is a high-performance soft keyboard layout designed for accurate and fast glide typing.
- This app will be released soon.

Decoder for Braille Keyboard on Touchscreens — **Mar. 2023 – Aug. 2024**
- Designed and Implemented a powerful Braille keyboard decoder using optimal transportation theory.
- Demonstrated superior error correction performance compared to both iPhone and Android Braille Keyboard.
- A user study showed that the intelligent Braille keyboard reduced the word error rate from 42.53% to 17.28%.
- This work is in submission to an academic conference.

LLM-powered Input Methods on Mobile Phones — **Sep. 2023 – Aug. 2024**
- Fine-tuned FLAN-T5 model for converting input signals (e.g. taps and gestures) into text.
- It achieves 93.1% top-1 accuracy on user-drawn gestures, outperforming the widely adopted Shark2 decoder.
- This work was published in CHI 2025.

Gesture Typing for Low Vision People — **Mar. 2021 – Mar. 2023**
- Designed and developed two keyboard prototypes to enable gesture typing for people with low vision.
- Proposed and implemented a kinematics-based decoding algorithm to accommodate the typing behavior of people with low vision.
- This work was published in UIST 2024.

Deep Learning for Medical Image Analysis — **Sep. 2019 – Sep. 2020**
- Adopted and optimized advanced CNN models to deal with image datasets, such as rogression analysis for survival analysis for brain tumor patients, Iron content classification inside organs, and analysis of chest X-rays for COVID-19.
- Become familiar with Keras framework and deep learning models.

Real Time Air Quality Monitoring and Prediction — **Sep. 2018 – Feb. 2019**
- Adopting both static and mobile IoT sensors which are placed on vehicles patrolling around for modeling the air quality pattern.
- Applied machine learning techniques(Support Vector Regressor, random Forest Regressor, Gradient boosting Regressor) to air quality data analysis.

– Visualized a full picture of how the air quality varies in nearby regions.
– This work was published in IEEE Access 2020.

Large-scale Financial Text Data Visualization **Sep. 2017 – Mar. 2018**

– Worked on large-scale financial text data visualization based on Deep Learning.
– Designed a visualization system that can bridge the deep learning models with the end users.

Personalized Augmentations of Data Visualizations **Jan. 2016 – Aug. 2016**

– Designed a framework that empowers people to view personal, private, or classified data through a casual head-mounted augmented reality device such as Google Glass.
– This word was presented in the poster session of IEEE Visualization 2016.

Publications

1. **Dan Zhang**, Yan Ma, Glenn Dausch, William H Seiple, Xianfeng Gu, IV Ramakrishnan, and Xiaojun Bi. *Intelligent Braille Keyboard on Smartphones* (In Submission).

2. Yan Ma, **Dan Zhang**, IV Ramakrishnan, and Xiaojun Bi. *LLM Powered Flexible Typing on Smartphones,* In Proceedings of the 2025 CHI Conference on Human Factors in Computing Systems (CHI 2025).

3. **Dan Zhang**, Zhi Li, Vikas Ashok, William H Seiple, IV Ramakrishnan, and Xiaojun Bi. *Accessible gesture typing on smartphones for people with low vision,* Proceedings of the 37th Annual ACM Symposium on User Interface Software and Technolog (UIST 2024).

4. **Dan Zhang**, and Simon S. Woo. *Real Time Localized Air Quality Monitoring and Prediction Through Mobile and Fixed IoT Sensing Network,* IEEE Access (2020): 89584-89594.

5. **Dan Zhang** and Simon S. Woo, *Poster: Predicting Air Quality using Moving Sensors,* In The 17th ACM international Conference on Mobile Systems, Applications and Services (MobiSys 2019).

6. **Dan Zhang**, Darius Coelho and Klaus Mueller, *Google Glass for Personalized Augmentations of Data Visualizations,* IEEE Visualization Conference (Poster), 2016.

7. Shenghui Cheng, Yue Wang, **Dan Zhang**, Zhifang Jiang and Klaus Mueller, *StreamVisND: Visualizing Relationships in Streaming Multivariate Data,* IEEE Visualization Conference(VAST 2015 Honorable Mention Poster).

8. Kui Fu, **Dan Zhang**, Peng Tang, Zhongliang Tang, Wei He, *Adaptive Extended Kalman Filter for a Red Shift Navigation System,* The 34th Chinese Control Conference (CCC), 2015.

9. **Dan Zhang**, Kui Fu, Shuzhi Sam Ge, Zhong-Liang Tang, Wei He, *Analysis of Filtering Methods for the SINS/CNS Integrated Navigation System of Missile Motion,* Proceeding of the 11th World Congress on Intelligent Control and Automation (WCICA), 2014.

Honors and Awards

– Grace Hopper Celebration (GHC) Student Scholarship (Sep. 2020)

– Annual Research Fellowship (ICTCCP) for three years, SUNY Korea (2014-2017)

– Third-class of People fellowship (Top 30%), University of Electronic Science and Technology of China (Sep. 2011)

– Freshmen Scholarship (Top 3%), University of Electronic Science and Technology of China (Sep. 2010)