Quan (Violet) Zhou

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Summary

Neuroscience Engineer and Data Scientist Researcher with cross-disciplinary expertise in signal processing, software development, mechanical engineering and hardware design. Specialized in computational modeling, large-scale neural data analysis, leveraging advanced techniques of machine learning. Proficient in Python, R, MATLAB, and C++, with a background in engineering and cognitive neuroscience. Passionate about leveraging engineering and data science to solve complex challenges and drive innovation and business impact.

Experience

Ph.D. Researcher in Neuroscience | University of Michigan, Ann Arbor   09/2023 – present
- Enabled early detection of Mild Cognitive Impairment and Alzheimer's Disease by applying machine learning algorithms to neural feature data. Conducted A/B testing to identify the optimal feature model, ensuring accurate prediction of cognitive decline.
- Advanced adaptive hearing aid design for older adults by developing deep neural networks to predict cortical responses in speech-in-noise scenarios and auditory digital signal processing.
- Increased neuroimaging data processing efficiency by 87% (from 30 to 4 minutes) through automated pipelines using Python, R, MATLAB, and Linux Bash.
- Conducted advanced fMRI and MRS analyses with SPM12, Gannet, and FreeSurfer, contributing to research on neurodegeneration and cognitive performance.

Lab Manager | Cognitive and Computational Neuroscience Lab | University of Michigan   2020 - 2021
- Coordinated with faculty, staff, and student researchers to manage data collection, analysis, and presentation for a longitudinal NSF-funded project (Michigan Neural Distinctiveness Study).
- Conducted over 180 hours of neuropsychological testing and fMRI/MRS scans, managed behavioral data, scored cognitive tasks, and maintained complex research databases.
- Advanced the understanding of neural dedifferentiation by analyzing resting-state brain connectivity data using mixed multilevel models, uncovering age-related dedifferentiation affecting cognitive performance.

System Test and Validation Engineer | Shanghai General Motors   07/2013 – 02/2018
- Reduced diagnostic response time from days to seconds by developing an Internet-of-Vehicle (IoV) framework for real-time data processing and analysis using Hadoop and Apache Spark. Collaborated with stakeholders to launch the prototype across 300+ engineering vehicles.
- Developed the Telematics-Box (T-Box) hardware for real-time vehicle data transmission, enabling engineers to monitor performance and improve efficiency.
- Accelerated vehicle testing by 30 days through the creation of a distributed cloud infrastructure, integrating system architecture, web-based interfaces, and Over-the-Air (OTA) protocols.
- Pioneered innovative telematics solutions, earning the Outstanding Project Award at the Pan Asia Technology Innovation Summit for industry recognition.

Skills

Programming Languages: Python, R, MATLAB, C++, Linux Bash
Machine Learning: LASSO, Support Vector Regression, Deep Neural Network
Neuroimaging Software: SPM12, FreeSurfer, Gannet, CONN toolbox

Education

Ph.D., Scientific Computing and Cognitive Neuroscience | University of Michigan, Ann Arbor   05/2028
M.ED., Educational Psychology | University of Austin, Austin   05/2021
B.S., Mechanical Engineering | Tongji University, Shanghai, China   2013