Shuangquan Feng

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EDUCATION

University of California San Diego (UCSD), La Jolla, CA September 2021 – June 2026 (Expected)
Ph.D. in Neurosciences (GPA: 4.0)

University of California San Diego (UCSD), La Jolla, CA September 2018 – June 2021
B.S. in Cognitive Science with a Specialization in Machine Learning and Neural Computation (GPA: 3.98)

RESEARCH EXPERIENCE

Graduate Researcher (Advisor: Virginia R. de Sa), UC San Diego September 2022 – Present

Deep Facial Expression Recognition & Applications

- Proposed a one-frame calibration framework and developed a Calibrating Siamese Network architecture for facial action unit (AU) intensity estimation, which improves the ICC(3,1) performance of IR50 on the DISFA dataset from 0.59 to 0.67
- Proposed and developed a model to automatically annotate user preferences of text-to-image generation (e.g. with Stable Diffusion) from facial expression reaction, which enhances the accuracy of ensemble scoring models from 65.8% to 68.6%

Development of Empathetic, Facial-Expression-Aware Multimodal LLM

- Designed a framework for integrating facial expression awareness into multimodal LLMs via instruction tuning, demonstrating effectiveness in generating more empathetic interactions in AI tutoring through LLM simulation and evaluation
- Currently working on deploying the framework in UCSD undergraduate classrooms to validate its real-world impact

Large Database Analysis of Device Usage

- Developed a method to identify temporal computer usage patterns of different groups based on clustering

Graduate Researcher (Advisor: Marcelo G. Mattar), UC San Diego June 2021 – Present

Cognitive Modeling of Human Planning & Decision-Making

- Designed and implemented a maze-routing task with PsychoPy/PsychoJS for understanding human planning and decision-making and conducted the experiment
- Showed that planning cost is non-constant and can be best characterized as a combination of sublinear functions of physical distance, representational tree distance, and temporal distance (by proposing a linear-log cost model achieving a geometric mean likelihood of 0.641 in modeling behavior in the maze-routing task outperforming that of 0.119 for the best constant-cost model)

Undergraduate Researcher (Advisor: Virginia R. de Sa), UC San Diego April 2019 – June 2021

EEG Data Analysis & Classification

- Showed the possibility of EEG-based memory confidence prediction: based on spectrotemporal analysis of EEG data, designed and trained classifiers that predict memory confidence with an accuracy of 58.4%

- Contributed to the implementation and testing of a novel algorithm (Spectrally Adaptive Common Spatial Patterns) for feature extraction for EEG data, which improves motor imagery classification accuracy from 63% to 66%

INDUSTRY EXPERIENCE

Data Scientist Intern, Meta June 2025 – September 2025

Enhancing Ad Delivery Efficiency by Reducing Wasted Ranking Cycles

- Developed an ad request waste prediction model that improved macro-average ROC AUC from 0.500 to 0.680
- Designed an adaptive resource allocation strategy for ad ranking, achieving a 0.27% improvement in total ad value in offline simulations.

PUBLICATIONS & PREPRINTS

Feng S*, Ma J*, de Sa VR. "FERGI: Automatic Scoring of User Preferences for Text-to-Image Generation from Spontaneous Facial Expression Reaction", *FG* 2025 (Oral). *equal contribution [Paper link]

Feng S, de Sa VR. "One-Frame Calibration with Siamese Network in Facial Action Unit Recognition", *arXiv* (2024). [Paper link]

Mousavi M, Lybrand E, **Feng S**, Tang S, Saab R, de Sa VR. "Spectrally Adaptive Common Spatial Patterns", *arXiv* (2022). [Paper link]

Mousavi M, Lybrand E, **Feng S**, Tang S, Saab R, de Sa VR. "Improving Robustness in Motor Imagery Brain-Computer Interfaces", *NeurIPS DistShift Workshop* (2021). [Paper link]

TECHNICAL SKILLS

Programming Languages: Python, MATLAB, Java, C++, R, SQL, LaTeX

Tools & Frameworks: SciPy, OpenCV, PyTorch, PySpark, EEGLAB, PsychoPy, PsychoJS

HONORS & AWARDS

- Graduated summa cum laude June 2021
- Rank of 400.5/4623 in the 79th William Lowell Putnam Mathematical Competition December 2018

CERTIFICATION

- Facial Action Coding System (FACS) Certification

MENTORING

- Philip Chi: undergraduate researcher at de Sa Lab, UC San Diego 2023 – Present
- Laura Fleig: undergraduate researcher at de Sa Lab, UC San Diego 2024 – 2025
- Junhua Ma: undergraduate researcher at de Sa Lab, UC San Diego 2023 – 2024