Erdong Chen

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EDUCATION

Washington University in St. Louis St. Louis, MO

M.S. in Computer Science Jan 2024 – Dec 2024

Bachelor's/Master's Scholarship (SP2024–FL2024)

Certificate in Data Mining and Machine Learning *GPA 3.76/4.0*

Washington University in St. Louis St. Louis, MO

B.S. in Computer Science Aug 2020 – Dec 2023

Dean's List (FL2021–FL2023) *GPA 3.76/4.0*

SKILLS

Programming: Python, C/C++, Swift, JavaScript, Java, SQL, Objective-C

Machine Learning: PyTorch, NumPy, Pandas, VLMs, reinforcement learning (RLlib, PPO)

Biomechanics & Simulation: OpenSim, musculoskeletal modeling, motion capture

Apps & Systems: SwiftUI, iOS, React, Node.js, FastAPI, MongoDB, Azure, AWS, Linux

RESEARCH EXPERIENCE

Dr. Feng Liu's Visual Intelligence Lab Philadelphia, PA

Research Assistant, Clinical Gait Analysis Jun 2025 – Present

Department of Computer Science, Drexel University

- **BioGait-VLM (MICCAI 2026, early accept):** Biomechanics-grounded VLM for pathological gait analysis; 68.1% accuracy vs 37.1% baseline; clinicians preferred it in 69% of cases.
- **Gait benchmark:** Merged an expert-labeled 30-patient degenerative cervical myelopathy (DCM) cohort with public GAVD into an 8-class, subject-disjoint benchmark.
- **GaitSim (ongoing):** 80-muscle, RL-trained gait simulator that models disease through physical mechanisms; curated motion data from ~960 people in 10+ clinical datasets; aims to simulate disease-specific gait from musculoskeletal conditions.

Dr. Jacob Greenberg Lab St. Louis, MO

Graduate Research Assistant, Tech Lead Jan 2024 – Present

Department of Neurosurgery, Washington University School of Medicine in St. Louis

- **SynapTrack (lead developer):** iOS app that tracks DCM severity via phone dexterity and walking tests; gait measures correlate with a gait mat at $r > 0.8$ ($n = 110$).
- Tech Architecture: Azure backend, MongoDB database, SwiftUI test modules.

- Collaboration: Co-designed app tasks with medical faculty; co-authored [2].
- **Video gait study:** Collected multi-camera OpenCap walking videos of DCM patients and controls, aligned with a gold-standard gait mat, to form a DCM walking-video dataset.
- **Compliance Hub (ongoing):** Opening SynapTrack to other labs to collect and analyze Apple Health, location, schedule, and questionnaire data, IRB/HIPAA-compliant.

TEACHING EXPERIENCE

Washington University in St. Louis St. Louis, MO

Head Teaching Assistant, Mobile Development Course Aug 2023 – Dec 2024

- Organize class logistics: Schedule TA office hours and assign lab grading.
- Hold office hours: Answer questions about course materials and monitor Piazza.
- Coordinate with faculty: Relay student feedback and discuss curriculum plans.

PUBLICATIONS

*Published (*equal contribution)*

[1] **E. Chen***, Y. Ji*, J. K. Greenberg, B. Steel, F. Arkam, A. Lewis, P. Singh, F. Liu. BioGait-VLM: A Tri-Modal Vision–Language–Biomechanics Framework for Interpretable Clinical Gait Assessment. *Medical Image Computing and Computer-Assisted Intervention (MICCAI)*, 2026 (Early Accept, top **~9%**). arXiv:2603.08564.

[2] P. Singh, **E. Chen**, B. Steel, N. Chicoine, S. Yakdan, M. Bydon, M. P. Steinmetz, Z. Ghogawala, W. Z. Ray, B. Johnson, R. Duncan, Z. Wilt, J. Badhiwala, C. Kelleher, J. K. Greenberg. A Neurosurgeon's Guide to Mobile Health Application Development With a Case Study for Cervical Myelopathy. *Neurosurgery*, 98(4):726–736, 2026. doi:10.1227/NEU.0000000000003717.

Manuscripts in preparation

[3] P. Singh*, S. Gonuguntla*, **E. Chen**, A. Pradhan, I. Becker, N. Xu, B. Steel, F. Arkam, S. Yakdan, B. Benedict, H. Naveed, W. Wang, Z. Wilt, J. Badhiwala, D. Hafez, J. Ogunlade, W. Z. Ray, Z. Ghogawala, C. Kelleher, J. K. Greenberg. A Qualitative Study of Patients and Healthcare Provider Perspectives on Mobile Health Assessments for Cervical Spondylotic Myelopathy. To be submitted to *Journal of Neurosurgery: Spine*.

[4] P. Singh, F. Arkam, A. Lewis, **E. Chen**, S. Yakdan, J. Wang, J. W. Yoon, S. Bess, T. Mroz, Z. Ghogawala, M. P. Steinmetz, W. Z. Ray, J. K. Greenberg. Passive Smartphone Gait Metrics as a Digital Biomarker for Cervical Spondylotic Myelopathy. In preparation.