

Andrew Yang

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Research interests: Human–AI cognition; computational cognitive neuroscience; neural measurement of comprehension and evaluation.

Education

University of Michigan, Ann Arbor, MI

Apr 2026

B.S. with Distinction | GPA: 3.90/4.00

Cognitive Science (Computation and Cognition track) and Computer Science

University Honors: Fall 2024, Winter 2025, Fall 2025; Dean's List.

Arizona State University (prior study before transfer); GPA: 4.00/4.00.

Selected coursework: Artificial Intelligence; Information Retrieval; Human-Centered Software; Human Neuropsychology; Cognitive Psychology; Mind & Machine; Knowledge and Reality (epistemology); Probability & Statistics.

Publications and Manuscripts

Peer-reviewed publication

1. Zhang, H., **Yang, A.**, Peng, A., Piepeta, L. F., Yang, J., & Ding, J. (2022). A quantitative study of software reviews using content analysis methods. *IEEE Access*, 10, 124663–124672. doi:10.1109/ACCESS.2022.3224048.

Preprint

2. Otstot, K., **Yang, A.**, Cava, J. K., & Sankar, L. (2024). *AugLoss: A Robust Augmentation-based Fine Tuning Methodology*. arXiv:2206.02286v2 (revised Jan 29, 2024).

Manuscripts under review / in preparation

3. Jang, H., Meka, K. S., **Yang, A.**, Mashour, G. A., Hudetz, A. G., & Huang, Z. *Target-dependent parameter–effect landscapes of low-intensity focused ultrasound neuromodulation in humans: a systematic review*. Under review at *Nature Communications*.
4. **Yang, A.**, Jang, H., Mashour, G. A., Hudetz, A. G., & Huang, Z. *Task-condition information persists during propofol-induced behavioral unresponsiveness: awake-trained fMRI decoders transferred to anesthesia*. First-author manuscript in preparation.

Research Experience

Huang Lab, University of Michigan

Oct 2025 – Present

Research Assistant; Center for Consciousness Science, Department of Anesthesiology

PI: Zirui Huang; supervisor: Hyunwoo Jang, PhD

- Led **CovConML**, decoding instructed mental-imagery conditions from parcellated fMRI in 26 participants (450 regions of interest) across awake, propofol-induced unresponsive, and recovery states. Sole developer of the analysis pipeline; first-author manuscript in preparation.
- Benchmarked logistic regression, a time-order-invariant meanMLP, and a temporal CNN using participant-grouped cross-validation; achieved **80.5–83.0% awake balanced accuracy** against 33.3% chance. Transferred frozen models to anesthesia without refitting to test cross-state persistence.
- Designed participant-level bootstrap and within-participant permutation analyses, false-discovery-rate control, transition-trimmed endpoints, and matched-coverage/capacity controls. Distinguished condition-related decoding during unresponsiveness from evidence of covert consciousness.
- Lead developer of **SonoMap**, an interactive evidence map and community-submission tool covering **230 human focused-ultrasound experiments from 136 articles**; contributed manuscript review to the accompanying systematic review (third author; under review).

Pal–Lee Collaboration, University of Michigan

Oct 2025 – Present

Research Assistant; computational EEG analysis, Department of Anesthesiology

PIs: Dinesh Pal (experimental) and UnCheol Lee (theoretical/quantitative)

Day-to-day mentor: Emma Huels, PhD

- Analyzed a **31-rat, 32-channel EEG** study of prefrontal TTX inactivation across wake, post-injection, sevoflurane, and recovery states with behavioral responsiveness markers; co-author on a manuscript in preparation.
- Built neuronal-avalanche analyses; recommended a composite criticality outcome after identifying DCC instability near $\alpha \approx 1$. Found **no detectable DCC drug effect**, but PFC-specific branching-ratio increases after TTX and attenuated departures of τ and α from critical values under sevoflurane.
- Implemented weighted phase-lag index, pairwise correlation, and autocorrelation with rat-level exact permutation inference. After TTX, PFC phase coupling fell at **5–15 Hz** and rose at **25–55 Hz**; correlation/autocorrelation fell **above 20 Hz**. These patterns were absent in S1 and M/LPtA.
- Identified recovery-label circularity and quarantined affected analyses. Extended the pipeline to prespecified paired carbachol/aCSF replication with fixed measures and thresholds, preserved QC segment boundaries, and documented timing provenance and rat-level exclusions.

Sankar Lab, Arizona State University

Oct 2023 – Jul 2024

Undergraduate Student Researcher, machine learning

PI: Lalitha Sankar; mentor: John Kevin Cava, PhD

- Second author of **AugLoss**, combining data augmentation and robust loss functions to address training-label noise and test-time distribution shift.
- Re-engineered the PyTorch data loader with multithreading and in-memory storage, achieving a **7-fold runtime speedup** and enabling revised-paper experiments on datasets of up to 100,000 images.

Software-Review Research Collaboration

Mar 2022 – Nov 2022

Data collection and dataset construction

- Developed browser-based collection and cookie/session-management workflows for a **36,000-review G2 dataset**; second author of the resulting peer-reviewed *IEEE Access* study.

Poster Presentations

Andrew Yang (presenter). *Parameter-free Decoding of Mental Task from Functional MRI During Propofol Anesthesia*. Poster presentation, 2026 Anesthesiology Research Retreat, University of Michigan, Ann Arbor, MI, Apr 25, 2026.

Teaching**Arizona State University**

Jan 2024 – May 2024

Undergraduate Teaching Assistant, CSE 205 — Object-Oriented Programming and Data Structures

- Assisted students with in-class programming assignments, troubleshooting code and clarifying object-oriented programming and data-structure concepts; answered course and assignment questions via email and Piazza.
- Helped design an EPICS attendance-management system (ESP32 RFID, Node.js, Canvas integration) deployed in **CSE 110 and CSE 205**; served 150+ students and processed 10,000+ attendance records.

Selected Projects

- **气 (Qi) Lang** — Chinese natural-language object-oriented language written in C, with a single-pass compiler, stack-based virtual machine, and automatic memory management; **400+ GitHub stars**.
- **GesturePresenter** — gesture-controlled slide navigation using MediaPipe hand tracking, a React remote, a Chrome extension, and a Flask/WebSocket backend; **190+ GitHub stars**.

Professional Experience

PayPal, San Jose, CA

Jul 2026 – Present

Software Engineer, Cloud Center of Excellence (Efficiency team)

- Designed and built an escalation and ticket-drafting workflow for the public-cloud help-channel agent (**3,600+ members; 20–30 requests/day**): the bot self-assesses when it cannot resolve a query, escalates to on-call, and drafts tickets only after **explicit on-call authorization**.
- Built an LLM-based analysis and prioritization tool for the cloud-request queue; its first run surfaced **100+ stale requests** and prompted a team-wide cleanup. Participate in on-call support for access provisioning, resource creation, and IAM workflows.

6Keywords / ERA Tool

Nov 2025 – Present

Technical Co-founder & Sole Architect

Legal-marketing competitive intelligence

- Led end-to-end architecture and implementation of a GCP analytics platform tracking approximately **141,000 firms**, with 12.2 million archived web captures and 1.3 million AI-assistant citations; sole developer of the core ingestion, attribution, intent-classification, MCP, and infrastructure systems.
- Designed three production LLM systems separating model-extracted evidence from deterministic decisions. Built a **26-tool Model Context Protocol (MCP) server** for agent investigations and human-reviewed change proposals, with **22,133 approved agent proposals**; every approved write is reversible.
- Developed an internal evaluation using **6,076 labeled mention records**; redesigned extraction and identity resolution to increase recall from **56% to 64%** while reducing incorrect attributions from **82 to 14** in an internal evaluation.
- Implemented a database-enforced account-access boundary for model-generated SQL, replacing an insufficient validator after testing four privilege-escalation cases; added checks for missing or invalid account scope.

PayPal, San Jose, CA

Jun 2025 – Aug 2025

Software Engineering Intern, Public Cloud Infrastructure

- Developed a custom Terraform provider in Go for IAM workflows, reducing manual role assignments by approximately 90%.
- Built a Claude-powered natural-language-to-BigQuery assistant on GCP; added caching and an auto-correction loop, reducing token cost by 65% and latency by 11 seconds.

PayPal, San Jose, CA

Jun 2024 – Aug 2024

Software Engineering Intern, Public Cloud Infrastructure

- Added VPC Service Controls policy resolution to a self-service security portal, reducing resolution time from days to minutes for 200+ developers; built a serverless enforcement pipeline handling 1,000+ policy updates per quarter.

Skills

Neural data and statistics: Parcellated-fMRI decoding; EEG connectivity and criticality analysis; participant-level bootstrap and permutation inference; false-discovery-rate control; cross-validation design.

Scientific computing: Python (NumPy, SciPy, scikit-learn, PyTorch); MATLAB.

AI systems: LLM agents and tool calling; MCP; human-approval workflows; evaluation and labeled datasets; prompt caching and cost monitoring.

Software and infrastructure: Python, C, C++, TypeScript, Rust, Go, SQL; PostgreSQL; GCP; Terraform; Docker/Kubernetes; React/Next.js.

Languages: English (native); Mandarin Chinese (heritage speaker; conversational, intermediate reading).