

Siyuan “Spencer” Liang

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EDUCATION

Cornell University, College of Arts & Sciences

Bachelor of Arts in Computer Science and Mathematics

May 2029

EXPERIENCE

Undergraduate Research Assistant

Jun 2026 – Present

Pervasive HCI Group, Tsinghua University

Beijing, China

- Designed a motion-aware multimodal rPPG framework that jointly aligns facial video and ring PPG representations, uses ECG-derived HR supervision, and applies IMU-based quality gating for heart-rate estimation during exercise.
- Built an end-to-end pipeline for 52.7 hours of multimodal recordings (5.6M video frames), synchronizing 30 FPS video, 128 Hz ECG, and 25 Hz ring PPG/IMU via wall-clock timestamps and generating 12K+ quality-controlled, 30-second windows for participant-held-out evaluation.

Undergraduate Research Assistant

Oct 2025 – May 2026

SciFi Lab, Cornell University

Ithaca, NY

- Co-developed SonicFit, an IMWUT 2026 submission for smartwatch-based full-body exercise pose tracking, achieving 8.61 ± 0.818 cm MPJPE by fusing IMU and acoustic echoes.
- Collected a 3.6M-frame multimodal dataset from 21 participants using 10-camera OptiTrack motion capture, 39 markers, and smartwatch streaming.
- Aligned OptiTrack, video, IMU, and acoustic streams to within 12 ms using timestamp matching.

BCI Sub-Team Member

Nov 2025 – Present

Cornell University Extended Reality Project Team

Ithaca, NY

- Developed 4-class EEG classifier for real-time movement-intent recognition (forward, backward, left, right) on Muse headset, achieving 61% accuracy for locomotion commands and 88.7% for blink detection to enable hands-free XR navigation.
- Modified 2 Unity XR environments for Meta Quest deployment, enabling headset-based navigation trials and synchronized EEG data collection.

PROJECTS

NailPilot | *FastAPI, Next.js, SAM3, MediaPipe, Python, TypeScript*

Jun 2026

- Built an AI nail try-on system using SAM3, MediaPipe landmarks, finger geometry, and alpha blending to render 57 nail styles on uploaded hand photos.
- Implemented product selection, image upload, generation, and similar-product recommendation APIs across a FastAPI backend and Next.js frontend.
- Analyzed Xiaohongshu manicure trends to generate merchant recommendations for homepage layout, content strategy, inventory, and try-on pool updates.

RouteCraft | *Next.js, React, Leaflet, Spring Boot, Java, PostgreSQL/PostGIS*

May 2026

- Built a full-stack route planner for running, hiking, and cycling using OSM graph data, GPX/KML uploads, and distance constraints.
- Generated loop, out-and-back, and point-to-point routes within 8% of target distance using A*, Dijkstra-style search, and Yen's K-shortest paths.
- Reduced spatial query latency to under 300 ms by indexing route geometries, bounding boxes, and OSM graph caches with PostGIS GiST indexes.

TECHNICAL SKILLS

Languages: Python, Java, C#, C/C++, TypeScript, JavaScript, HTML/CSS

Frameworks & Libraries: React, Vite, Next.js, FastAPI, Node.js, Spring Boot, PyTorch

Tools: Git, Docker, CUDA, PostgreSQL/PostGIS, Cloudflare, Render, Vercel, Unity, Linux, Trellis

Languages: Native Cantonese and Mandarin; highly fluent English