

Yicheng Ying

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EDUCATION

Columbia University

Bachelor of Science, Mechanical Engineering & Computer Science

GPA: 3.7

Coursework: Data Structures & Algorithms, Discrete Mathematics, Linear Algebra, Partial Differential Equations

Aug 2025 - May 2028

New York City, NY

EXPERIENCES

Fernwey

Feb 2026 - Present

Software Engineer Intern

- Built a real-time cross-platform arbitrage detection system using Gemini 2.5 Flash to semantically match Polymarket events against Kalshi's ~1000-event catalog, with two-phase ticker verification to prevent AI hallucinations against the live API
- Orchestrated 4 external APIs (Polymarket Gamma, Kalshi Events, Gemini, Kalshi Markets/Series) with parallelization, multi-tier caching (30 min–1 hr TTLs), and keyword pre-filtering to minimize token usage
- Implemented a three-tier background sync service (Redis invalidation every 5 min, lifecycle management every 2 hrs, AI clustering every 6 hrs) and fixed data hydration to paginate up to 500 markets, eliminating silent data loss
- Reverse-engineered Kalshi's undocumented URL structure via the Series API and built a card UI displaying side-by-side Yes/No probabilities with color-coded price differential badges; added 60s frontend auto-refresh with live sync status

Zhejiang University

Jun 2025 - Aug 2025

Machine Learning Researcher

- Developed a deep-learning cell segmentation system using a custom Dual-Decoder U-Net architecture in PyTorch, which delivered precise instance segmentation and enabled a 20% increase in accuracy in neighbor-cell analysis for downstream experiments
- Implemented automated microscope control by calculating cell centroids from segmentation results and mapping coordinates to focus points.
- Built an interactive PyQt5 GUI for real-time analysis, parameter tuning, and phase classification (Interphase, Prophase, etc.)

PROJECTS

Apple Vision Pro Assistive Reader for Dyslexic Individuals

Oct 2025

HackHarvard

<https://github.com/garybs16/Hackharvard-2025>

- Implemented a guided Focus Reader with per-line highlighting at configurable WPM using TimelineView and TextKitline-fragment measurement.
- Built a visionOS-first reading app in SwiftUI, bridging PDFKit/PDFView via UIViewRepresentable/NSViewRepresentable for seamless cross-platform UI.
- Integrated ElevenLabs TTS with AVFoundation (async synthesis, delegate-driven start/pause/resume, robust error handling).
- Optimized PDF thumbnails & page navigation for smooth scrolling and crisp previews; shipped accessible, polished UI with spatial assets for visionOS and graceful fallbacks elsewhere.

StonksGPT - LLM-Powered Voice Trading Assistant

Feb 2026

DevFest

<https://github.com/Tobbs2005/StonksGPT>

- Architected a full voice→STT→LLM→TTS pipeline using ElevenLabs Realtime WebSocket STT (16 kHz PCM resampling, VAD-based commit) integrated with structured tool-calling workflows; enabled real-time conversational financial analysis.
- Designed and implemented a tool-result compression layer for Model Context Protocol (MCP), transforming raw tool outputs into minimal structured facts before re-injection into the LLM, reducing tool-result token usage by ~70–90% while preserving decision-critical semantics.
- Eliminated LLM-based chart formatting in favor of deterministic data transformation, reducing chart rendering latency from multi-second LLM calls to sub-100 ms execution (~10× speed improvement).
- Built a cost-aware, multi-provider LLM orchestration system (Gemini primary, OpenAI gpt-5-nano fallback) with schema filtering (43→30 tools), mandatory tool-use prompting, refusal detection, and multi-turn recovery logic to improve reliability under token and rate constraints.

TECHNICAL AND LANGUAGE SKILLS

Technical: Python, MATLAB, SolidWorks, TypeScript, Node.js, React, Vite, Express, Tailwind, Java, Swift, SwiftUI

Tools & APIs: Gemini, OpenAI, Alpaca, ElevenLabs, Polymarket, Kalshi, Redis, PyTorch, PyQt5, GitHub

Language: Mandarin Fluent, English Fluent

Interests: Cooking, Violin, Sailing