Tony Yiding Tian

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EDUCATION

University of Pennsylvania - School of Engineering and Applied Sciences Philadelphia, PA
B.S.E. in Computer Engineering, M.S.E. in Computer Graphics and Game Technology *May 2027*
- GPA: 3.74 — Relevant Courses: Data Structure & Algorithm, Embedded Systems, Electrical Circuit, GPU Programming, Advanced Rendering, Interactive Computer Graphics, Operating Systems Design & Implementation

EXPERIENCE

Linux Kernel Policies Research Assistant - PURM Scholar May 2025 – Present
Learning Directed Operating System (LDOS), Prof. Sebastian Angel *Philadelphia, PA*
- Developed eBPF-based kernel monitoring infrastructure collecting real-time TCP networking metrics across 5+ workload types including iperf3, Redis benchmarks, and high-frequency trading simulations
- Engineered high-performance data analysis pipeline processing 10,000+ TCP state transitions per second, identifying critical performance bottlenecks in kernel networking policies and congestion control algorithms
- Architected and contributed 2000+ lines of C and Python code to open-source KernMLOps repository, implementing kernel probing infrastructure used by 15+ researchers

Beta Test Engineer & QA Analyst Dec 2022 – Oct 2023
miHoYo - Genshin Impact (AAA Mobile Gaming) *Remote*
- Selected as exclusive beta tester for Genshin Impact, a $4B+ revenue mobile game with 60M+ monthly active users, participating in pre-release testing cycles every 6 weeks
- Conducted comprehensive quality assurance testing for 10+ character releases, each generating $1M+ in revenue, ensuring gameplay balance and identifying critical performance issues before public launch
- Performed systematic testing of open-world gameplay mechanics including combat systems, puzzle design, and performance optimization across multiple mobile platforms (iOS, Windows)

PROJECTS

T&T Slots - Biometric-Adaptive Gaming System | *ATMega328PB, Bare Metal C* Mar 2025 – May 2025
- Engineered embedded gaming system integrating biometric feedback with real-time probability adjustment, featuring custom ATMega328PB firmware managing 3 concurrent hardware subsystems
- Developed custom I2C communication protocol for MAX30102 SPO2 sensor achieving 100Hz heart rate sampling with 95% accuracy, implementing digital filtering algorithms to eliminate motion artifacts
- Architected real-time graphics rendering engine for LCD display supporting 16-bit color depth, custom sprite animation system, and pixelized gameplay with memory-optimized frame buffering
- Implemented adaptive probability algorithm correlating heart rate variability to winning odds, dynamically adjusting game difficulty based on physiological stress indicators with 200ms response latency
- Optimized embedded system performance achieving 1% CPU idle time through interrupt-driven architecture and efficient memory management across 2KB SRAM
- Links: Project Website — GitHub Repository

TremorChecker - Parkinson's Disease Screening Device | *Python, Raspberry Pi* Jan 2021 – Jun 2023
- Architected non-invasive Parkinson's disease screening system using electrostatic field detection, achieving 85% correlation with clinical tremor assessments through advanced signal processing algorithms
- Implemented real-time tremor frequency analysis using Microchip MGC3030 3D gesture sensor and Raspberry Pi 4B, processing 130Hz spatial data with custom digital signal processing pipeline
- Developed frequency domain analysis to detect tremor signatures between 4-6Hz characteristic of PD
- Engineered automated diagnostic software generating comprehensive medical reports with tremor amplitude measurements, frequency analysis, and clinical risk assessment scores
- Conducted clinical validation study with 50+ participants in Shenzhen, achieving 82% diagnostic accuracy compared to neurological assessments, with false positive rate below 15%
- Applied Chinese utility patent and presented research at 2023 International Science and Engineering Fair (ISEF), competing among top 1% of global participants
- Built scalable IoT architecture supporting cloud data synchronization and remote monitoring capabilities for longitudinal patient tracking

TECHNICAL SKILLS

Programming Languages: C/C++, CUDA, GLSL, Python, Java, eBPF, Assembly, JavaScript, LATEX
Graphics & Rendering: OpenGL, DirectX, Real-time Ray Tracing, Path Tracing, PBR, Procedural Generation
Systems & Tools: Linux Kernel Development, Docker, Qt, Git, CMake, Embedded Systems, TCP/IP
Frameworks & APIs: Qt, Raspberry Pi, ATMega, VMware, CloudLab, Jupyter Notebook