Kanay Gupta

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EDUCATION

University of New South Wales (UNSW) February 2023 – Expected December 2026
Bachelor of Advanced Computer Science (Honours)

- Achieved Faculty of Engineering Dean's Honours List (2023).
- WAM: 86 (High Distinction)

RELEVANT EXPERIENCE

LedgerMind (AI-Powered Tax Compliance App) September 2025 – November 2025
Project Manager and Lead Engineer (Capstone Consultant for IntelliServe)
Tech Stack: Python, React Native, PostgreSQL, Docker, OpenAI API, RAG, Jira, Git

- Directed a 6-person agile team to develop an AI-driven tax deduction mobile app for the client IntelliServe, managing sprint cycles and weekly stakeholder consultations to deliver a functional MVP.
- Engineered an automated data pipeline using LLMs to extract structured expense details (vendor, date, amount) directly from user-uploaded receipt images, voice logs, and email invoices, eliminating manual data entry.
- Designed a Retrieval-Augmented Generation (RAG) system that cross-references extracted receipt data against real-time ATO regulatory feeds to automatically generate and validate tax claims.
- Implemented the "Claim Progress Checker" and audit export features, ensuring data persistence and generating compliance-ready PDF evidence packs for user tax returns.

AI-Powered Job Ad Extractor (LLM Comparative Analysis) March 2025 – April 2025
AI Engineer (Industry Project for SEEK)
Tech Stack: Python, PyTorch, HuggingFace, Scikit-learn, Pandas, Gemini API, TinyLlama

- Led a comparative analysis of three distinct models for a SEEK-sponsored project: a traditional Scikit-learn baseline, a fine-tuned open-weight LLM (Pythia), and the proprietary Gemini API.
- Engineered and fine-tuned a Pythia-160m model with custom prediction heads, reducing MAE by over 95% compared to the logistic regression baseline.
- Benchmarked the Gemini API, establishing its state-of-the-art performance (MAE <$1k) for numerical extraction, and built the foundational dataset by annotating 50+ samples to achieve a 94% inter-annotator agreement.

TECHNICAL PROJECTS

Ray Tracing Engine from Scratch in Rust - GitHub
Tech Stack: Rust, Multithreading

- Architected a high-performance, multithreaded path tracing engine in Rust from the ground up without the use of external crates, implementing physically-based materials (metals, dielectrics), a configurable camera with depth-of-field, and texture mapping.
- Leveraged Rust's concurrency primitives (Arc, Mutex) to parallelize rendering, achieving a 7.16x performance increase on a 16-core CPU compared to a single-threaded approach.

Game Engine Memory Analysis for CS:GO
Tech Stack: Python, Windows API, Reverse Engineering

- Conducted in-depth reverse engineering of the CS:GO game engine to map critical memory structures for real-time player and game-state data.
- Engineered a Python-based external tool to directly manipulate game memory, capable of both reading game-state for a custom visual overlay and writing to memory to programmatically control player input.

Autonomous Tetris Agent with Computer Vision
Tech Stack: Python, OpenCV, PyAutoGUI

- Engineered an autonomous Tetris agent by creating a computer vision pipeline in Python and OpenCV that performs real-time screen analysis to determine optimal block placement. Consistently cleared 40 lines in 15 seconds, a performance ranking within the top 3 of Tetr.io global player leaderboards.

SKILLS

- **Languages:** Python, Rust, TypeScript/JavaScript, Java, C#, SQL, HTML/CSS
- **Frameworks and Libraries:** React.js, Next.js, Node.js, Tailwind CSS, OpenCV, PyAutoGUI, HuggingFace, Scikit-learn, Pandas
- **Developer Tools and Platforms:** Git, PostgreSQL, Docker, Linux, Bash, Unity, LaTeX, Windows API, Gemini API