ZHAN KANG NG

+65 8614 7752 | zhankang.work@gmail.com | linkedin.com/in/ngzhankang | github.com/ngzhankang

EDUCATION

Singapore University of Technology and Design (SUTD) **Sept 2024 – Expected 2028**
B.Eng., Computer Science and Design (Artificial Intelligence)

Singapore Polytechnic **Apr 2019 – Apr 2022**
Diploma in Information Technology

EXPERIENCE

Undergraduate Research Assistant (Decentralized Federated Learning) | GitHub Repo **Dec 2025 - Present**
Temasek Laboratories, SUTD – Supervised by Dr. Marie Siew (PI)

- Built the first real-hardware prototype of DFL-TL, a novel DFL framework targeting IEEE Transactions publication (Li, Deng, Siew et al.) – translating simulation-only results into a fully operational distributed system on physical edge devices
- Converted a Python simulator into a live distributed network on NVIDIA Jetson Orin Nano hardware – infrastructure now deployed across multiple independent student testbeds for parallel validation, with active expansion as the prototype matures; built the gRPC + Protobuf transport layer for async PyTorch model exchange
- Implemented the DFL-TL aggregation algorithm (ADFed) on-device – including intra-cluster sync FedAvg, inter-cluster gossip with staleness-aware weighting, and homomorphic hash verification for model integrity
- Validated the multi-objective peer selection cost function – jointly minimising communication cost, computation idle time, and data distribution difference (via Earth Mover's Distance) – under Dirichlet (α =0.5) non-IID skew, achieving **99.1% peak accuracy** on physical hardware
- Delivered a full Docker deployment; pending potential co-authorship on the paper upon successful hardware validation

AI Product & UX Researcher (Freelance) **Dec 2025 – Jan 2026**
Maibel Pte. Ltd.

- Architected an emotionally intelligent, low-friction user onboarding flow for an AI-driven wellness companion, balancing critical biometric data capture with psychological safety and user trust
- Engineered NLP conversational scripts and AI persona guidelines, applying sociolinguistics and politeness theory to optimize the Telegram bot's tone and minimize early-stage user attrition
- Formulated a strict Data-to-Purpose mapping architecture, ensuring all collected user inputs (goals, age, emotional state) were directly integrated into the downstream Retrieval-Augmented Generation (RAG) pipeline for personalized task generation
- Conducted comprehensive UX/UI and SWOT analyses across competitor AI companions and habit trackers, utilizing Figma to rapidly prototype and present evidence-based design pivots directly to the CEO

Software Engineer Intern (Machine Vision) **Sept 2021 – Feb 2022**
Inspiraz Technology Pte. Ltd.

- Built an automated visual inspection module for the WizerPro2 production platform in C++ (Halcon SDK), fully automating thread orientation detection and dimensional classification for manufacturing QC
- Replaced brute-force contour mapping with optimised best-fit line and intersection models, cutting inspection **compute time by 76%** on high-resolution inputs
- Resolved critical memory leaks and DLL dependency conflicts across a large legacy codebase; wrote complete technical documentation covering algorithmic logic and API integration

PROJECTS

Machine Learning Capstone Project (United Overseas Bank) **|** GitHub Repo

- Engineered an NLP text-mining pipeline to autonomously parse and classify corporate webpages into **4** granular business categories (Sector, Subsector, Archetype, Value Chain).
- Trained and benchmarked BERT, VDCNN, and MLP multi-label architectures on a dataset of **11,000+ text records**, achieving **98% peak accuracy** evaluated against precision, recall, and loss matrices.
- Deployed the final prediction engine via a localized Python application, leading to direct adoption by UOB to automate data entry and significantly reduce human client profiling errors.

HealthyHelper Bot (SIM-UOL CSSC Hackathon)

- Built a personalized Telegram diet assistant powered by the **Perplexity API (Sonar LLM)**, architecting a full RAG pipeline that dynamically generates meal plans from real-time biometric inputs (BMR, TDEE) and time-of-day context
- Engineered an automated data pipeline using **Selenium** to extract, clean, and structure **1,800+ local food nutrition records** from the Health Promotion Board, enabling sub-second fuzzy search via RapidFuzz
- Implemented an **NLP fact-checking engine** that tokenizes user queries, filters stop words, and grounds all AI responses exclusively to authoritative medical sources (MOH, CDC, NHS) — eliminating hallucinated health claims

Personal Website (Hakyll , SCSS) **|** Website

- Engineered a performant static site architecture utilizing Hakyll (Haskell) and custom SCSS, with a GitHub Actions CI/CD pipeline for zero-downtime deployment.

VOLUNTEER

Core Team Lead **April 2023 – Present**

Budding Minds

- Spearheaded the operational turnaround of the grassroots tuition center by recruiting, training, and mentoring a new core executive team, ensuring the long-term sustainability of the organization.
- Developed the organization's foundational web infrastructure using Softr.io and Airtable, engineering an automated attendance-tracking system that successfully eliminated manual documentation errors.

SKILLS

- **Language**: English , Mandarin
- **Coding Language:** Python, C++, JavaScript, HTML/CSS, SQL, Bash
- **AI & ML:** PyTorch, Transformers (BERT), RAG Pipelines, NLP, Computer Vision (Halcon), LLM APIs (Perplexity Sonar)
- **Infrastructors & Tools:** Docker, gRPC/Protobuf, NVIDIA Jetson (edge deployment), Git/GitHub Actions (CI/CD), Linux, React