TING-YANG KAO

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3 YoE of work and research in Computer Vision, Machine Learning, and Deep Learning Applications

WORK EXPERIENCE

Machine Learning Engineer Feb. 2023 - Jul. 2023
Perfect Corp. (Top 100 apps in Photo & Video, YouCam Perfect & YouCam Makeup) New Taipei City, Taiwan

- Designed an image data preprocessing pipeline using **Python**, **NumPy**, and **OpenCV** to create a customized half-body semantic segmentation dataset
- Developed the AI hairstyle changer feature with **Generative AI models** using **PyTorch** in the app, which has garnered **over 1 billion downloads** and boosted the company's revenue
- Integrated **LLMs** into the data preparation pipeline for **Stable Diffusion model fine-tuning**
- **Addressed** the critical half-body segmentation **accuracy bottleneck** for real-world data through custom **data augmentation** and **loss functions**, enabling product integration and a broader range of user scenarios
- Leveraged **TorchScript** to collaborate with server team, enabling efficient model deployment and on-time product launch
- Shared cutting-edge research on **Deep Learning for CV** and **NLP** in a paper study group, sparking colleagues with insights for innovative project proposals or solutions

Machine Learning Engineer Mar. 2022 - Jan. 2023
NeuinX Corp. Hsinchu, Taiwan

- Pioneered the first **real-time Deep Learning approach** for comprehensive basketball shot analysis from any recording angle, enabling instant feedback and automatic highlight generation
- Achieved a **significant 7% improvement** in basketball field goal analysis accuracy, meeting the demands of real-time application in live basketball games
- Leveraged **TensorRT** to optimize model inference speed by **68%**, enabling real-time analysis with minimal hardware needs
- Developed a real-time basketball shot analysis interface (**Python threading, websocket, Unity**) with **dynamic data visualization** for performance feedback and live demos
- **Conference Paper (first author):** TY Kao, TY Pan, CN Chen, TH Tsai, HK Chu, MC Hu, "ScoreActuary: Hoop-Centric Trajectory-Aware Network for Fine-Grained Basketball Shot Analysis," *ACM Multimedia (MM)*, Oct. 2022 [link]

Deep Learning and Image Processing Intern Jul. 2021 - Sep. 2021
AU Optronics Corp. Taoyuan, Taiwan

- Accelerated defect analysis by **60%** via building a GUI (**PyQt5, SQLite**), enhancing data access and workflow efficiency
- Developed a **lightweight Deep Learning pipeline** featuring **TensorRT** integration (**Python, OpenCV, PyTorch**) for accurate (>90%) and real-time Defect Severity Identification on edge devices

EDUCATION

Georgia Institute of Technology Aug. 2023 - Dec. 2024

- M.S. in Computational Science and Engineering (College of Computing) | GPA 3.75/4.0 Atlanta, Georgia
  - Coursework: Computer Vision, Computational Data Analysis, High Performance Computing (Parallel Programming)
  - Project: *Safest Itinerary Suggestion* - Deployed a **Scalable Full-Stack Machine Learning Web Application** on **AWS**, leveraging **MLOps** and **CI/CD pipelines** for automatic model training, deployment, and monitoring

National Tsing Hua University Sep. 2020 - Dec. 2022

- M.S. in Information Systems and Applications | GPA 4.04/4.3 Hsinchu, Taiwan
  - Coursework: Computer Graphics (OpenGL, Shader), Virtual Reality (Unity, SteamVR, XR Interaction Toolkit)

National Cheng Kung University Sep. 2016 - Jun. 2020

- B.S. in Engineering Science | GPA 3.78/4.3 | Ranking: 6/56 Tainan, Taiwan
  - Project: *Smart Shopping Cart* [link] - Deployed **Deep Learning, Machine Learning**, and **Sensor Fusion algorithms** onto edge devices (Raspberry Pi 3) to power the **Robotics** prototype featuring customer tracking, obstacle avoidance, and indoor localization

SKILLS

Python: Used in 10+ projects over 10000 LoC, with pytest, pdb and Git version control | C, C++, C#, Scala, Julia

Machine Learning: PyTorch, OpenCV, Scikit-learn, TensorRT, CUDA, NumPy, SciPy, Pandas, Seaborn, Matplotlib, LangChain

Cloud & MLOps: AWS, SageMaker, CloudWatch, CodePipeline, Docker, Kubernetes | **Tools:** Git, Spark, Linux, Shell script

CV/ML Tasks: Object detection, Object tracking, Semantic segmentation, Pose estimation, Video analysis, SLAM, LiDAR