Peter Hanping Chen
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Areas of Expertise

- Python/tkinter-GUI/Cython
- Artificial Intelligence
- Machine Learning: Scikit-learn/PySpark
- Deep Learning: PT (PyTorch), TF (Tensorflow), Keras
- Deep Reinforcement Learning: Deep Q-Learning
- Flask/Fast-API/Django
- HTML-5/CSS3/JavaScript/ReactJS Hook/jQuery/React Native
- MongoDB/MySQL/OracleDB/Postgres

Professional Experience:
AIU (American Innovation University), SAN JOSE, CA
09/2022-Present
Part-Time ML Engineer, CS Department

- Law ChatBot: LangChain, HuggingFace Pile of Law Dataset, LLM (Gemini) LangChain, Custom Information (Excel Q&A/ MySQL/ Vector Database).
- Plant Leaf Classification: Kaggle Plant Leaf Dataset, Build/Train Model/Quantize Model by Colab Notebook, Backend served by FastAPI/uvicorn, Chrome Frontend ReactJS Hook/Material-UI, Deploy application on GitHub/Render.com/localhost, and Android App by React Native with Android Studio.
- Student chatBot: Created Meta (few shots): Unstructured question/MySQL query, HuggingFace LangChain, Google PaLM, FAISS, and GUI with Streamlit.
- OpenCV (Edge, Haar Cascade Face/Eye detection) and OpenGL/PyGame (Vertices/Edges/Faces, Perspective/Rotation, Setup Surface Color)
- Online classroom face segmentation and detection with OpenCV by face count and match face CNN with face ID.
- DRL (Deep Reinforcement Learning) for CPU/GPU Configuration Optimization:
  - Environment: Gem5-McPAT (Simulator for Multi-Core of Power, Area, Timing). Simulation. Return reward with simulation and target difference.
  - CPU/GPU configuration with Policy Based and Value Based DQN (Deep Q-Learning Neural Network) Approximation.
- SVU Management System
  - ReactJS Hook (useState, useRef, useCallback, useContext, Form Submit), AG-GRID (column grouping, data editing, sorting, filtering), Flask routing/URL parameters processing, Big Data retrieve, restore, and transmit.
  - Student registration, course selection, search, grading, retrieve transcript/modification.
  - Kubernetes Master/Slave server installation/configuration, kubectl, kublet, docker-compose, image creation.
  - ChatBot/ChatGPT transformers: JavaScript voice translation, Process and clean up Reddit and git clone dataset, sqlite3 database.

FUTUREWEI, SANTA CLARA, CA
06/2021–09/02/2022
Sr. Staff Software Engineer, IC Lab

- Completed Design Space Exploration for CPU/GPU (Architecture, Power, and area optimization) modeling/optimization with MAB (Multi-Armed Bandit) for control variable distribution and PPO (Proximal Policy Optimization) PyTorch, Tensorflow under Kubernetes/docker container.
- Completed implement of Feature selection/reduction by sci-kit learn by Bi-Direction/Random Forest.

- Completed PCA (Principal Component Analysis) for Model dimensionality reductions.
- Utilized TensorFlow's data augmentation and transfer learning techniques to improve model generalization and reduce overfitting.
- Completed integrated Machine Learning tool Hypermapper for features (categorical, ordinal, integer, and real) for multi-objective optimization (with maximum performance, and minimum area/power) with Gem5/Aladdin End-to-End SOC Simulation docker image for workloads with accelerated functions.
- Developed the Memory Model for Cache/Load Queue/Store Queue by C/C++ for application program.
- Docker Run, create docker image, container parameters passing, docker volume, Dockerfile, Docker-compose, container orchestra.

QUALCOMM, SAN DIEGO
04/2013 - 05/2021
Sr. Full Stack Developer
Camera Performance:

- Controlled/Validated Medical camera movement with motor for static and shear force for rotation.
- Simulated CMOS Image sensor by SPICE for bandwidth and latency time.
- Developed and deployed deep learning models using TensorFlow for various applications, including image recognition and natural language processing.
- Completed Camera Performance PKI by ReactJS, Flask, Python.
- Completed deployment multiple micro-service apps on Kubernetes with load-balance control on dashboard and real-time execution on Apache Flume, Kafka, Spark based on batch mode modeling.
- Deployed Model by Flask server on AWS: Developed Camera chip performance simulation Model for maximum bandwidth and minimum latency time for ISP (Image Signal Process) with Static Timing analysis.
- Frontend GUI (HTML, CSS, ES6, React, AXIOS/AJAX API): Flask RESTful API, Dashboard, Frequency Sweep, Simulation panel, Hierarchical Chip Browser.
- Backend: Python, JSON/YAML File processing

QA Verification:

- Qualcomm Quality Verification Dashboard: Developed customer real-time phone call/text message by Splunk.
- Front end: ReactJS, JQuery, Asynchronous concatenation and parallel, data structure sort by Date/time, State Machine, Chip Quality PKI, and NG-Grid spreadsheet.
- Back end: NodeJS/MongoDB, classified defect and failure.

TATUNG COMPANY, TAIPEI, TAIWAN
01/2009-04/2013
Sr. Project Manager

- Power surge model prediction
- Integrated Ethernet, EtherCat, PCIE into Power Control system.
- Signal Integrity Power Integrity/Thermal Analysis/EMC Analysis.

FARADAY TECHNOLOGY, HSINCHU, TAIWAN
01/2004-04/2009
Sr. Project Manager

- Characterized power, slew rate of Image Sensor.
- Automized IP Mixed Signal Verification Flow/Flow by SPICE simulator, IPC by Socket Programming, and distributed computing (VNC, GRID, LSF) by Python PyQt/Qt GUI/C++/STL, GNU Debugger.
- Oversaw the selection and procurement of microcontroller components, ensuring compatibility and reliability.
- Run-time controls the inventory/bonus of distributed EDA license with public/private cryptography.

- QA tools: IBM ClearCase (Global File Management), Coverity/ Purify Code Coverage / Quantify Performance, HSpice/FineSim, PSpice and Mentor Graphics

NATIONAL SEMICONDUCTOR, SUNNYVALE, CA
07/1995–12/2003
CAD Manager

- EDA tools and technologies integration and Testing.
- Solved Antenna effect in Chip Manufacturing.

LSI Logic, Milpitas, CA,
07/1987–07/1995
CAD Engineer

- Developed Placement and Routing algorithm for datapath design.
- Developed/Released front-end/backend tools and technologies for Mixed Signal Design.
- RF analog signal measurement and testing system.

BMSR (Biomedical Simulation Resource), USC, Los Angeles, CA
05/1985-07/1987
Research Assistant

- C++ Programmer/Research Assistant
- Interfaced EEG machine.
- Developed Wiener, Volterra functional kernels for neural network model for brain wave simulation and diagnosis.

Education

- Part-time Study:
    - EMBA (44 units), NCTU (National Chiao-Tong University), Hsinchu, Taiwan (5/2011-8/2013), Phi-Tau-Phi award
        - Thesis: Business Planning and Forecasting in High-Speed EtherCAT and High-Power IGBT Motor Control
    - PhDEE (60 units), ITU (International Technological University), Santa Clara, CA (1/1995-12/2003)
        - PhD Dissertation/paper: “Beat the Competition: A knowledge-Based Design Process Address the Antenna Effect and Cell Placement,” IEEE Device and Circuit (Volume 20, May-June, 2004). 6 citations, https://ieeexplore.ieee.org/document/1304538
        - Paper: “Fixing antenna problem by dynamic diode dropping and jumper insertion,” IEEE/ISQED (2000), 33 citations, https://www.semanticscholar.org/paper/Fixing-antenna-problem-by-dynamic-diode-dropping-Chen-Malkani/ce75dc8d162d8e709ab0b58816563098d9234b0e
- MSEE (Artificial Intelligence), USC (University of Southern California), Los Angeles, CA (1886-1987)
    - AI Project, “Medical Auto-Diagnosis Expertise System,” (1986)
- MSBME (Biomedical Engineering), USC, Los Angeles, CA (1995-1986)
    - Research Project/Report: “Brain Kernel Modeling by Voltera-Wiener Kernel Convolution,” (1986)
    - Published 1 journal paper in Data modeling.
- MSCS, NCU (National Central University), Taiwan (1979-1981)
    - Thesis: “Crude Oil Component-Temperature Data Modeling and Steam-Stripper Tower Simulation,” (1981)
    - Published 2 Journal papers in data model and process simulation.

Awards & Distinctions

- Well-known Antenna Effect patent and solution sold to Synopsys, Inc. in 1997.
- Analog Characterization patents (15+) sold to Faraday Technology, Inc. in 2006.

- Synopsys Best Papers Awards (10+), 2000-2009
- Phi-Tau-Phi Academic Award, for best NCTU/EMBA
- Published Papers (20+), Institute of Electrical and Electronics Engineers and Industrial Conferences
- US Patents (30+), Algorithms/Mathematical Modeling for device and power characterization (https://patents.justia.com/inventor/peter-h-chen)