**Peter Hanping Chen**

Git-Hub: https://github.com/peterhchen?tab=repositories

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**Areas of Expertise**

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

**Professional Experience:**

**SILICON VALLEY UNIVERSITY, SAN JOSE, CA 09/2022-Present**

**Part-Time ML Engineer, CS Department**

* Implemented Education chatbot by Hugging Face LangChain, Google LLM PaLM (Pathway Language Model), Meta FAISS (Facebook AI Similarity Search) Vector Database, and Streamlit GUI. Corrected Natural Language to SQL translation error with meta (few shots) learning.
* DL (Deep Learning) Projects: CNN, RNN/LSTM, MNIST/Kaggle Image, Crypto-Currency dataset Model Fit and Prediction, and GPT4All (Meta Llama), Neural Network Programming (Input Layer, Forward Layer, Activation function, Softmax, Loss Function), TensorFlow's high-level API, Keras, for model building and training.
* 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.

**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), National Chiao-Tong University, Hsinchu, Taiwan (5/2011-8/2013), Phi-Tau-Phi award
  + 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>
* MSCEE (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>)