Wing Poon

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1. Objective

- Experienced embedded systems engineer well-versed in hardware, firmware and systems integration — seeking to transition into machine learning, particularly in industrial or business automation utilizing Computer Vision, NLP or DL. Requiring end-to-end skills in problem specification, system design, ethical considerations, data collection and wrangling, modeling, evaluation, deployment and monitoring.

2. Certifications

- ***FourthBrain:*** Machine Learning Engineer 🔗
- ***TensorFlow.org:*** TensorFlow Developer 🔗
- ***AWS:*** Certified Machine Learning Specialty 🔗
- ***AWS:*** Certified Cloud Practitioner 🔗
- ***DeepLearning.AI (Specializations):***
  - Deep Learning 🔗
  - TensorFlow Developer 🔗
  - TensorFlow Advanced Techniques 🔗

3. Projects

- **Domain Fine-Tuned, GPT-2 Auto-Completion Text Editor:** A context (2022 Russia-Ukraine War) fine-tuned, causal language-model editor (PoC) for journalists who have to report from the field under difficult conditions and time pressures. Training corpus scraped using APIs. Writers need only type ~40% of the words they otherwise would have to. [Hugging Face, Spacy, Curses, NYT API] 🔗
- **Semi-Supervised Methods on Medical Datasets:** Fully supervised approaches need large, densely annotated dataset. Utilize Self and Semi-Supervised Learning with Knowledge Distillation on pediatric pneumonia x-rays to significantly reduce the need for fully labeled data. REST API Web-App container deployed on GCP Cloud Run. [TensorFlow, SimCLR, FixMatch, FastAPI, Bootstrap, Docker] 🔗
- **Identifying Cancer using Computational Histopathology:** Evaluate different machine-learning algorithms for identifying metastatic cancer in small image patches taken from larger digital pathology scans. Understand how traditional hand-engineered Computer Vision features compare against Deep Learning's automatic feature-extraction. [SK-Learn, SK-Image, TensorFlow, Dask, TPOT, PyOD] 🔗

4. Experience

- Machine Learning Student (+ Self-Study) : FourthBrain (CA) *www.fourthbrain.ai* , 08/2021 – Present

  16-week bootcamp, backed by Andrew Ng's AI Fund and designed for students with a professional software background. Engineers apply machine learning and deep learning methods with the goal of deploying end-to-end, scalable and production-ready solutions. Projects vetted by subject-matter experts.

  Working as a 3-persons team, our capstone project won a FourthBrain Top Project Award.

- Embedded Systems Engineer : Kernel (CA) *www.kernel.com* , 07/2020 – 08/2021

  Co-designed embedded hardware for world's first wearable full-head TD-fNIRS (Time-Domain functional Near-IR Spectroscopy) brain neuroimaging appliance. Miniaturize from rack-mounted to head-mounted system. Validate power delivery and data aggregation pipelines. Develop bringup, diagnostics and production testing firmware. Semiconductor supply-chain risk planning and mitigation.

- Principal Hardware Engineer : Quanergy (CA) *www.quanergy.com* , 09/2018 – 06/2020

  Complete redesign of next-gen solid-state LiDAR design for cost and form-factor. Redesign and characterization of ultra-short pulsed laser-driver with improved performance. Support new silicon bring-up. Maintain and improve Python/PyQt tools for optoelectronics calibration, data visualization, test automation and data-collection. Develop new algorithms for weak-signal detection.

- Systems Hardware Engineer : Google (CA) *www.google.com* , 08/2017 – 05/2018

  Lead-EE on Stadia wireless streaming game-controller. Low-power, low-cost, high-volume. From-scratch redesigned for cost, fully-functional from first build. Sensor-EE on Nest Hub smart-display assistant.

- Principal Hardware Engr. / Firmware Engr : GoPro (CA) *www.gopro.com* , 02/2012 – 06/2017

  API design and coding of Java Aerial SDK for direct control of UAV via smartphone. Launched Camera Hardware SDK for direct control of GoPro cameras by third-party integrators.

  Lead-EE on GoPro Karma, GoPro's very first UAV – Architecture definition, component selection, schematics and layout, prototyping, performance evaluation (EE, RF, ME, Battery, Motors, Sensors), flight and safety testing, design validation, compliance certification and yield improvement.

  Lead-EE on three generations of GoPro's cameras – HD3:Silver, HD3+:Silver, HD4:Session. End-to-end CE product development cycle – hardware and firmware-interface specification, component selection, schematic capture and layout, board bring-up, test plan authoring and execution, compliance testing, EE/ME/FW integration and troubleshooting, ODM DFM/BOM/ECO reviews. 3rd EE hired at GoPro.

- Sr. Hardware Engr. : NaturalPoint (OR) *www.naturalpoint.com* , 01/2008 – 11/2011

  Responsible for board hardware, firmware and FPGA (Altera Cyclone & Xilinx Spartan) design of USB and Ethernet(PoE) connected IR Motion-Capture camera systems. Complete product line refresh and new product introduction. Development of digital video-processing algorithms and custom IP in Verilog.

5. ML Skills

- *Libraries:* TensorFlow, Keras, PyTorch, Hugging Face, Spacy, OpenCV, SK-Learn, SK-Image, SciPy, Numpy, Pandas, Matplotlib, HDF5, TFRecord, BS4, FastAPI, Pydantic
- *Concepts:* Loss-Funcs, Metrics, Bias / Variance, Regularization, Backpropagation, Gradient Descent, Optimizers, Skip-Conn / Chain-Rule, Feature Engr, Dimen Reduction, HP Tuning, Ensembling, Distillation, Attention, Error / Ceiling Analysis, Transfer Learning, Ethical AI
- *ML:* LinR / LogR, SVM, Bagging / Boosting, Anomaly Detection, Clustering, Label-Prop, Zero-Shot
- *Sequence Models:* RNN, LSTM, WaveNet, Transformers, Language Models, Beam Search, Sampling
- *Vision Models:* CNN, GAN, U-Net, YOLO, ResNet, Siamese Net, Feat Extractors, Autoencoders
- *NLP:* Token'tion, TF-IDF, Word2Vec, Embeddings, Lemma'tion, Normal'tion, NER, Similarity Search
- *CV:* Point / Morph / LSIS Ops, Moments, Hist EQ / Otsu, NLM, Non- / Linear Filters, Noise-Est / Weiner, Edge / Line & Shape (Hough) / Corner Detection, LBP / HOG / Haar / SIFT Features, Snakes / Boundaries, Segmentation / GrabCut, Compress Sense / Sparse Repr, DCT / Coding / Quantization

6. CS Skills

- *Lingua francas:* Python, SQL (basics), Java, C, Assembly
- ISRs, Concurrency, Object-Oriented Programming, Data Structures, Design Patterns, Version Control
- Embedded Systems Programming (e.g. STM32CubeMX), Multithreaded RTOS (e.g. FreeRTOS), Android Development, Networking Protocols (e.g. 802.3, ARP, DHCP, IP, UDP, TCP, HTTP)

7. EE Skills[1]

- RF Systems: Propagation, Link Budgets, Desense, Antenna Matching, Smith Charts
- Bus Interfaces: SDIO, USB, LVDS, ISA, IDE, GPSI, (R/G)MII, SPI, I2C, RS-232, 1-WIRE
- Memory Interfaces: Async/Sync SRAM, DDR3 DRAM, NAND/NOR FLASH
- Signal Processing: Signal-Conditioning, Data-Acquisition, FIR Filters, Match Filters, PID controllers
- Digital Video Processing: Morph Filters, Object-detection, JPEG encoding, Bayer-to-RGB demosaicing
- FPGA/CPLD: Xilinx Zynq / Spartan-6, Altera Cyclone-III, FLEX-10k
- Micro-Controllers/Processors: STM32 ARM Cortex, NXP i.MX, TI DM385, SoC ARM1136, Cypress FX2LP, SiLab C8051F, Renesas H8/S, Ubicom IP2K/IP3K, Scenix SX, Microchip PIC, Intel 8051/8086
- Analog Design: Transistor Amps, BJT/FET Circuits, Op-Amp Circuits, Filters, Signal-Conditioning, Mic/Sensor Interfacing, ADC/DAC/Codec, Clock Synthesis, TimingRecovery, PLL/DLL/DDS
- Device Interfacing: RS-170 Video, BT.656, Parallel/LVCMOS-LCD, LVDS/CMOS-Sensor, DC/Servo/Stepper-Motor, BLDC ESC, Sensors (Accel/Gyro/Mag/Baro), GPS
- Power Systems: Switching-Regulators (SMPS), Linear-Regulators, High-Power Li-Ion Battery Charging/Management, Low-Power (Battery-Operated) Design, Power-over-Ethernet (PoE), Power-Management IC (PMIC), Power-Sequencing/Steering/Control
- Design for EMC: Return currents, Loop Area, Bypassing, Transmission-lines, High-Speed PCB layout
- Signal Integrity: Impedance/Timing Control, Signal Routing & Termination, Drive-level/Pre-emphasis
- Regulatory Compliance: RTCA DO-160 (EMC), FCC (EMI), CE (EMC/ESD), HDMI, Shock/Vibe

8. Trademark Strengths

- *Communication Skills:* Communicating unambiguously through written prose or verbal discourse
- *Self-Motivated:* Works independently or collaboratively, being proactive and helpful, taking initiative
- *Productive Learner:* Keeping abreast of technology, utilizing/creating tools to improve productivity
- *Deadline and Commitment Driven:* Going the extra step to ensure project timeliness
- *Anticipates Problems:* Knowledge of common technical pitfalls, practicing preventive disambiguation
- *Attention to Detail:* Assumption validation, diligent review and cross-checking, circling back
- *Astute Troubleshooting:* Multi-disciplinary engineering knowledge, creative hands-on problem-solving
- *Integrity and Transparency:* Keeping team/organization's best interests at heart, an open book
- *Department-in-One:* Specification, scheduling, critical-path/risk planning, procurement, DFA/DFM/DFT

9. Articles

- Feature Engineering for Machine Learning: Part I – Data Preprocessing, Part II – Feature Generation
- Using Google Colab Like a Pro

10. Education

- B.S. Electrical Engineering and Computer Science (University of California at Berkeley) 🔗
- CS Coursework: Microcontrollers, Computer Architecture, Structure & Implementation of Programs, Data Structures, Machine Structures, Operating Systems, Artificial Intelligence, Efficient Algorithms.

[1] This last page provides *background context* only and can be TLDR'ed