ATTIANO PURPURA-PONTONIERE

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EDUCATION

University of California, Los Angeles (UCLA), GPA: 3.7 **Los Angeles, CA**
Master of Science, Computer Science *December 2020*

University of California, Los Angeles (UCLA), GPA: 3.8 **Los Angeles, CA**
Bachelor of Science, Electrical and Computer Engineering *Cum Laude March 2019*

Honors: *9x Dean's List, Awarded ESAP(Top 15% class '19), Recipient of Kinecta Scholarship, Recipient of Kalosworks Endowed Scholarship, Recipient of Muriel K. and Robert B. Allan Fund Scholarship, Requested by Chair of Computer Science at Laney College to tutor student with autism, Invited to present accessible coding workshop at National Down Syndrome Congress Convention yearly*

COMPUTER SKILLS

Most proficient-least: *C/C++, Python, Tensorflow, PyTorch, Bash/Batch, LaTex, Git, Java, Docker, K8S, AWS EC2 S3, Cmake/Maven, AMQ, CI/CD*

WORK EXPERIENCE

Lockheed Martin **Palo Alto, CA**
AI Research Engineer – Advanced Technology Center *April 2021 – Present*

- Submitted $500,000 CRAD proposal as AI/ML/Financial lead to NGA, SOTA anomaly detection on HyperTemporalImagery
- Submitted $150,000 IRAD proposal as PI on applying reinforcement learning to sensor management, pending approval
- Awarded $16,000 seedling funding: Data Science Sponsored Innovation, exploring low-shot satellite imgs, submitted to SPIE
- Manage a team of 3 engineers of varying skill levels: entry-level, PhD senior, and a PhD senior staff delivering on deadline
- Manage a high-priority R&D cognitive application, requiring design/dev/integration/test of software w/ hardware teams
- Work on large corporate IRAD with high visibility across company business areas: RMS, Space, Aeronautics, CETO, MFC

Robotire – Startup YCombinator W20 **San Carlos, CA**
Computer Vision Engineer *July 2020 – December 2020*

- Designed, developed, tested and integrated custom object detection model with Mitsubishi articulated industrial robots
- Built custom dataset & infra from scratch by collecting, labeling and parsing data w/ Python scripts for JSON and CSV files
- Evaluated and fine-tuned various SOTA models such as Efficientdet and FRCNN using Tensorflow 2's object detection API
- Integrated CV service by building a REST API in Python using Falcon and Docker wrapping Tensorflow Serving and gRPC

UCLA Computer Science Department **Los Angeles, CA**
Lead Teaching Assistant *January 2020 – January 2021*

- Led discussion sections for 40+ students in Computer System Architecture/Organization, upper/lower-division CS courses
- Created spec, student skeleton code & autograding scripts for Parallel lab. Led CS33 Parallel lab, Bomb lab, and Malloc lab
- Rated overall 8/9 by students, prepared materials such as slides, proctored exams & answered questions online for students

Raytheon **El Segundo, CA**
Software Engineer – Space and Airborne Systems: Secure Sensor Solutions *May 2019 – July 2020*

- Injected random noise into SAR data→had a consensus of classifiers identify/correct mislabels resulting in >96% correction
- Built a variable-size data augmenter w/ complex rotation, Rayleigh and Gaussian noise, improved classification by >14%
- Developed a python script to automate the plotting of ROC curves given a classifier and a dataset using Tensorflow
- Debugged instrumentation/BDB maker for EO sensor's servo codebase in SVN branch, pushed code that made Jenkins build

HSQ Technologies **Hayward, CA**
Software Development (UX/UI) and Control Systems Intern *June 2018 – September 2018*

- Updated program (rtudiag.exe) written in C for DOS by creating a GUI with same backend resulting in 49% more efficiency
- Coded a GUI in visual basic/python to connect with the C backend in visual studio using multi-language programming
- Estimated bid for LA metro gold station contract by meticulously pouring through the requested designs, saved 20 hours
- Answered customer's questions about rtudiag.exe and provided troubleshooting resulting in 5/5 customer feedback

UCLA Electrical Engineering Department **Los Angeles, CA**
Electrical Engineering Lab Mentor *August 2017 – June 2018*

- Coached groups of 3-5 undergraduate EE students through assigned lab projects such as verifying Kirchhoff's laws
- Provided hands-on guidance to groups as they built a line-following robocar using motors, phototransistors and arduino nanos

Peralta Community Colleges **Berkeley, CA**
Lead Tutor *August 2012 – June 2016*

- Tutored students one-on-one or small groups in subjects such as Math, Chemistry, Physics and Computer Science
- Hand-selected by Chair of Computer Science department at Laney College to tutor student with autism, to positive feedback

LEADERSHIP AND PROFESSIONAL DEVELOPMENT EXPERIENCE

Stanford Radiological Sciences Lab - AI/ML Medical Image Analysis **Stanford, CA**
Principle Investigator *March 2021 – Present*
- Paper on Supervised Relational Contrastive Learning submitted Med-NeurIPS with guidance from post-doc at Stanford RSL

Rap Lyric Generator **San Francisco, CA**
Principle Investigator *September 2020 – December 2020*
- Lead a team of 3 CS M.S. students in the research and development of a rap lyric generator using NLP & webscrapped data
- Implemented LSTM as a comparison baseline, GPT2, BART, XL-NET as STOA generative models with custom evaluation

IBM Quantum Computer Evaluation **Los Angeles, CA**
Key Contributor, Researcher *April 2020 –June 2020*
- Implemented Grover's search algorithm in Pyquil, and Qiskit to evaluate QC simulators, ran algorithm on IBM 5qubit QC
- Evaluated performance of Pyquil & Qiskit's quantum simulators--reviewing documentation and algorithm implementation

EMG Signal Decomposition **Los Angeles, CA**
Project Lead *September 2019 – December 2019*
- Given real EMG data obtained from electrodes in monkeys, used Matlab for signal decomposition to find 4 motor neurons
- Used FFT to bandpass relevant frequencies, threshold spikes based on RMS power, and K-means on PCA of filtered signal

Handwritten Character Recognition **Los Angeles, CA**
Undergraduate Capstone *September 2018 – March 2019*
- Employed ML python libraries such as tensorflow, matplotlib and numpy to classify 'handwritten names' dataset and MNIST
- Created/trained a Convolutional and Recurrent Neural Network to find the character probability of an image with >93% acc

UCLA Digital Signal Processing Lab **Los Angeles, CA**
Project Lead *September 2018 – March 2019*
- Utilized a DSP specific embedded system to record and modulate speech: add reverb, playback at half speed, twice speed
- Programmed DSP-board in Code Composer Studio to perform straight-line polygon recognition using the Hough Transform
- Recognized vowels in audio using an Artificial Neural Network based on Mel Frequency Cepstral Coefficients from Matlab

Eta Kappa Nu (HKN) EE Honor Society – Autonomous Robocar **Berkeley, CA**
Project Lead *August 2017 – June 2018*
- Designed an autonomous battery powered robot-car that avoids obstacles and finds the shortest path
- Utilized phototransistors, infrared sensors, servo-motors, pixy camera and Arduino for feedback control of robocar

Battleship Videogame in C++ **Los Angeles, CA**
Software Developer *March 2017 – June 2017*
- Used Object Oriented Programming to make a battleship game that output text to the command line as a GUI
- Created and implemented various methods and objects in C++ for human and AI players
- Created three levels of intelligence for AI – easy player, mediocre player, and good player

Coding For All **Redwood City, CA**
Founder *August 2014 – June 2016*
- Designed a two hour workshop to introduce young people with special needs to computer programming
- Presented at the National Down Syndrome Congress Convention in Arizona in 2015, invited back each following year
- Presented multiple times at the Silicon Valley Down Syndrome Network in Palo Alto throughout 2015 and 2016

PAPERS SUBMITTED

1. **Supervised Relational Contrastive Learning for Effective Medical Image Classification -** *A. Purpura-Pontoniere, A. Wang, D. Terzopoulous, A. Imran* - submitted to ISBI 2022 - pending approval
2. **Efficient ATR Using Contrastive Learning -** *A. Purpura-Pontoniere* - accepted in SPIE Defense and Commercial Sensing ATR Conference 2022
3. **Advanced HyperTemporal Imagery Processing For Early Launch Detection and Tracking of Hypersonic Glide Vehicles -** *E. Berkson, A. Purpura-Pontoniere,* - submitted to NGA Big-R BAA 2022 - pending approval
4. **Lugnut Identification Using State of the Art Regional and Fully Convolutional Neural Networks -** *A. Purpura-Pontoniere,* - sold to Robotire