Daryl Choo

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Education

Columbia University in the City of New York — New York, NY
University College London (UCL) — London, UK
Bachelor of Science in Electrical Engineering, Minor in Computer Science — Sept 2021 – May 2025

GPA: 3.72/4.00 | Dean's List: Fall 2021 – Fall 2023
Courses: Neural Networks, Deep Learning, Machine Learning, Robot Learning, Probability, Linear Algebra, Data Structures
Teaching Assistant: Electronic Circuits, Circuit Analysis

Experience

NASA — NASA Johnson Space Center Neutral Buoyancy Laboratory, Houston, TX
Mission Director – Micro-gravity Neutral Buoyancy Experiment Design Team (Micro-g NExT) — Sept 2022 – Jun 2024
- Led research proposal for autonomous camera prototype ranked among top 3 finalist designs nationwide
- Deployed **YOLO object detection algorithm** with 78% mean average precision in tracking astronauts in Orion capsule water landings for Artemis program with **TensorFlow** & **PyTorch** github.com/nasa-micro-g-next
- Developed **RF** direction-finding system for autonomous vehicles, by modeling Watson-Watt direction-finding research

Guidance, Navigation & Control (GNC) Engineer – Lucy Student Pipeline Accelerator & Competency Enabler — Jan – Apr 2024
- Led trade studies evaluating trade-offs on **LiDAR** & **IMU**, raising Technology Readiness Level of Mars rover by 100%

Columbia University — New York, NY
Research Assistant – Robotics Studio, Department of Mechanical Engineering — Sept – Dec 2023
- Deployed **Proximal Policy Optimization (PPO) reinforcement learning algorithm** with custom **OpenAI Gym** environment for **robot learning** in **PyBullet simulation** github.com/darylchooo/ppo
- Developed **SOLIDWORKS computer-aided design (CAD)** of quadrupedal robot with 8 degrees of freedom

Research Assistant – DitecT (Data & innovative technology-driven Transportation) Laboratory — Sept 2024 – Present
Department of Civil Engineering & Engineering Mechanics
- Applied stereo cameras for **pose estimation** of AWS DeepRacer autonomous vehicles in **Robot Operating System (ROS 2)**
- Generated **point clouds** for **3D perception** of **augmented reality (AR)** ArUco markers in **OpenCV**
- Extracted & constructed **scene graphs** & **knowledge graphs** from **LIDAR**, **radar** & camera in **multimodal** nuScenes autonomous driving dataset
- Applied **perspective transformations** with **homography** for **Visual Simultaneous Localization And Mapping (vSLAM)**

Shell — Kuala Lumpur, Malaysia
Electrical Engineering Intern – Projects & Engineering Technology — Jun – Aug 2024
- Developed **deep neural networks** for energy forecasting distributed energy resources of prosumers
- Optimized **battery energy storage systems** reducing carbon emissions by 10 kilotons per year
- Led **design reviews** of **schematics**, **layouts** & **bill of materials**, increasing design life of 2 offshore oil rigs by 25 years

University College London (UCL) — London, UK
Research Assistant – Sensors Systems & Circuits Group, Department of Electronic & Electrical Engineering — Jan – May 2024
- Designed & fabricated **PCB** designs with **small outline integrated circuit (SOIC)** packages with **Altium**
- Simulated & led **bench-top testing** of amplitude demodulation circuits for telemetry in biomedical implants in **LTSpice**

Projects

- **Computer Vision Robot Boxing Game**: Creating robot boxing game in **Unity 3D** with **YOLO computer vision algorithm** for **pose lifting 2D keypoint detection** to **3D pose estimation**
- **Electromyography (EMG) Audio Synthesizer**: Optimized real-time **signal processing** with **k-Nearest Neighbours (kNN)**, **Principal Component Analysis (PCA)** & **Linear Discriminant Analysis training algorithms** for **feature extraction** on EMG datasets
- **Full-Stack Web Application for Gastrointestinal Patient Survey**: Awarded Rome Foundation from Science University of Malaysia for connecting **HTML**, **CSS** & **Javascript** frontend to **Node.js** server with **Express.js**, integrating **RESTful API** for CRUD operations on **MySQL** database github.com/darylchooo/gap
- **Switched-Mode Power Supply**: Designed & simulated **step-down DC-DC Buck converter** with 85% efficiency in **MATLAB Simulink**, by sizing & designing discrete **power electronics**
- **DRC-clean, LVS-clean Microprocessor in Calibre**: Created sized schematic & bit-stack layout with TSMC 65-nm CMOS in **Cadence Virtuoso** for 6T SRAM, level-sensitive latch, 8-bit logarithmic left shifter, 3:1 multiplexer & static ripple-carry adder driven by programmable logic array (PLA), simulating in **Spectre FX** to verify functionality & delay of critical path

Technical Skills

Languages: Python, Java, MATLAB, SQL, Javascript, HTML, CSS, MIPS, Arduino
Frameworks: TensorFlow, PyTorch, OpenCV, Linux, NodeJS, Express, REST API, ROS, Github
Software: Cadence, Unity, Altium, AutoCAD, SOLIDWORKS, Simulink, LTSpice, JIRA, Confluence