Eugene Teoh

eugeneteoh.com

Email: eugenetwc1@gmail.com
Github: github.com/eugeneteoh

Research Interest

Robot Learning, Reinforcement Learning, 3D Perception, Time Series, Multi-agent Systems

Experience

- **Dyson** — London, UK
  Senior Machine Learning Research Engineer — *Nov. 2022 – Jul. 2024*
  - **Overview**: Founding member (first hire) of Dyson Robot Learning Lab (DRLL), working with Stephen James, Xiao Ma, Mohit Shridhar, Younggyo Seo et al. DRLL was an industry research lab, focused on enabling general-purpose robot intelligence through sample-efficient (reinforcement & imitation) learning algorithms, leveraging human demonstrations and autonomous exploration.
  - **Manipulating Deformable Objects**: Led project on handling deformable objects with state-of-the-art imitation learning algorithms (ACT, Diffusion Policy). Explored methods on scaling existing robot datasets using generative models (Grounding DINO, Segment Anything, Stable Diffusion) Collected over 1000 robot demonstrations. Presented demos to senior management.
  - **3D Vision Priors for Next-best-pose (NBP) Agents**: Worked on exploring 3D vision priors (Depth Anything, DUST3R) for NBP agents with PhD intern, Stephen Tian.
  - **Engineering**: Contributed to building a general robot learning package, RoboBase). Technical lead of an initiative to scale robot learning through data collection.
  - **Infrastructure**: Technical lead of compute infrastructure for three teams, managing both on-premises servers and Google Cloud. Managed 52 on-prem GPUs with Slurm and distributed file systems (NFS, SeaweedFS) with Ansible. Created Terraform and Packer templates for OS images and instance templates on Google Cloud.
  - **Simulation**: Led initial efforts to build a gym environment for robotics using Unity Game Engine.
  - **Open Source**: Contributions to RLBench, LeRobot, Docker images for Unity et al. See my Github contributions.
  - **Miscellaneous**: Achieved top 10% performance company-wide in 2023, with feedback from 24 peers across 8 teams.
  - **Keywords**: Robot Learning, Reinforcement Learning, Imitation Learning, Unity Game Engine, Deep Learning Infrastructure
- **Amazon Web Services** — London, UK
  Data Scientist — *Sep. 2021 – Oct. 2022*
  - **Overview**: AWS Professional Services Consultant. Helping enterprise customers build Machine Learning and Application Development solutions.
  - **Time Series Forecasting**:
    - Improved demand forecasting by transitioning to SageMaker Pipelines with DeepAR models. Achieved production-grade ML pipeline and received 4 five-star feedback ratings. Co-authored a blog post with the customer team, detailing the project's success.
    - In another project, developed a demand forecasting pipeline for 6 million SKUs using SageMaker Pipelines. Improved accuracy by 4.3% with DeepAR and XGBoost, leading to an estimated €10 million revenue increase.
  - **Computer Vision**: Utilised image embedding similarity (ResNet, ViT) to detect parcel theft by comparing trailer images; achieved over 60% accuracy with less than 40 image pairs.
  - **data.all Deployment**: Involved in a project on deploying data.all, a data marketplace built on AWS.
  - **Open Source**: Contributed to Amazon SageMaker Examples, SageMaker Python SDK, data.all and GluonTS et al.
  - **Miscellaneous**:
    - Initiated and managed an ML Reading Group with 45+ members. Conducted and presented workshops to 30+ graduates on topics such as anomaly detection and multi-agent pathfinding.
    - Volunteered as an instructor at Amazon's Machine Learning University, covering computer vision and reinforcement learning.
  - **Keywords**: Time Series, Computer Vision
- **Senseye—Acquired by Siemens** — Southampton, UK
  Research Data Scientist Intern — *Jun. 2021 – Aug. 2021*
  - **Overview**: Predictive maintenance at scale. Worked under James Loach on anomaly detection for streaming data. Developed a new system using Gaussian Mixture Models, reducing false positives by 70% and increasing accuracy.

- **PingSpace** Penang, Malaysia
  Software Engineer Intern *Jun. 2020 – Sep. 2020*
  - **Overview**: Robotic warehouse start-up. Worked as an Algorithm Engineer in the Traffic Control Team. Research and Development on Multi-agent Path Finding.
- **Intel** Penang, Malaysia
  Electronics Engineer Intern *Summer 2018 and 2019*

Publications

[1] Eugene Teoh, Sumit Patidar, Xiao Ma, and Stephen James. Green screen augmentation enables scene generalisation in robotic manipulation, 2024. URL https://arxiv.org/abs/2407.07868.

Education

- **Univerisy of Southampton** Southampton, UK
  Master of Engineering (MEng) in Electronic Engineering with AI; 1st Class Honours *Sep. 2017 – Jun. 2021*
  - **Projects**:
    - **Forecasting at Scale**. Developed a global forecasting model that generates forecasts of 10000+ time series. **Keywords**: ARIMA, Gaussian Processes, Facebook Prophet, LightGBM, Time Series Clustering
    - **One-shot Audio-based Object Identification**. Designed a system to identify and verify objects or speakers using sound, based on a few examples, scalable to more objects. Use the VoxCeleb dataset. **Keywords**: Siamese Networks, Short-time Fourier Transform, Constant-Q Transform
  - **Relevant Modules**: Deep Learning, Reinforcement & Online Learning, Advanced Machine Learning (98%), Computer Vision (88%), Foundations of Machine Learning (88%), Computational Biology, Digital Control System Design, Secure Hardware & Embedded Devices

Skills & Interests

- **Programming Languages & Tools**: PyTorch, Python, AWS, Google Cloud, C#, C/C++
  Certifications: (AWS) Cloud Practitioner, Solutions Architect Associate, Developer Associate, Data Analytics Specialty, Machine Learning Specialty
  Interests: Olympic Weightlifting