Daniel (Chee Hian) Tan

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Research Interests

I am interested in developing scalable and intelligent control algorithms to enable complex problem-solving embodied agents. My PhD research will focus on learning temporally abstracted decision-making policies to progressively build a library of increasingly complex 'skills'. Concretely, I am interested in information-theoretic and representation-based option discovery methods, as well as leveraging the human problem-solving abilities captured by LLMs to decompose complex tasks into general and modular components.

Education

SEP 2017 - SEP 2021
Stanford University - *B. Sc. Mathematical and Computational Sciences*

SEP 2022 - PRESENT
University College London - *M. Phil/PhD. Computer Science*

Research Posts

JUL 2021 - AUG 2022
Agency of Science, Technology, and Research, Singapore- *Research Engineer*

- Supervised by Michael Meng Yee Chuah and Yau Wei Yun at Institute of Infocomm Research, Robotics and Autonomous Systems department
- Implemented reinforcement learning methods to train legged locomotion controllers
- Deployed said controllers to hardware and collected real-world data to improve system

Publications

Tan, D.C., Acero, F., McCarthy, R., Kanoulas, D., & Li, Z. (2023). Value Functions are Control Barrier Functions: Verification of Safe Policies using Control Theory. *ArXiv, abs/2306.04026*.

Tan, D.C.*, Zhang, J.*, Chuah, M.I., & Li, Z. (2023). Perceptive Locomotion with Controllable Pace and Natural Gait Transitions Over Uneven Terrains. *ArXiv, abs/2301.10894*.

Darici, E., Rasmussen, N., Tan, D.C. Ranjani, J.J., Xiao, J., Chaudhari, G.R., Rajput, A., Govindan, P., Yamaura, M., Gomezjurado, L., Khanzada, A., & Pilanci, M. (2022). Using

Deep Learning with Large Aggregated Datasets for COVID-19 Classification from Cough. *ArXiv, abs/2201.01669*.

Industry Experience

AUG 2022 - OCT 2022

Virufy - *MLOps Tech Lead*

- Supervised by Amil Khanzada, CEO. Volunteering on-and-off since Apr 2021
- Designed, developed, and maintained data processing pipelines to aggregate offline and streaming data into a single unified format and data store
- Developed pipeline to deploy trained model checkpoints as microservices to be used by the frontend application

JUN 2019 - DEC 2019

GovTech, Singapore - *Software Engineering Intern*

- Supervised by Leehong Lau, Tech Lead of Embedded Systems team.
- Developed a computer vision pipeline for crowd-counting to deploy on edge devices
- Experimented with multiple methods of compressing large vision models without losing performance

JUN 2019 - SEP 2019

TripAdvisor, Boston - *Software Engineering Intern*

- Implemented a ranking algorithm based on word features to maximize diversity of top results
- Developed a machine learning model to rank hotel listings based on predicted click-through rate

Open-Source Contributions

- **Mujoco-MPC:** https://github.com/deepmind/mujoco_mpc/pull/51
- **CleanRL**: https://github.com/vwxyzjn/cleanrl/pull/320
- **MBRL-Lib**: https://github.com/facebookresearch/mbrl-lib/pull/135
- **IsaacGymEnvs:** https://github.com/NVIDIA-Omniverse/IsaacGymEnvs/pull/111

Teaching

University College London

- COMP0188 Deep Representations and Learning, Autumn 2022
- COMP0233 Research Software Engineering in Python, Autumn 2022