MONASH
ENGINEERING

MONASH University

Faculty of Engineering

Summer Research Program 2023-2024

Project Title: Exploring Offline Reinforcement Learning approaches for human behaviour modelling

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Objective

Explore and evaluate offline reinforcement learning (RL) approaches to learn models that capture suboptimal human behaviour

Project Details

Models of human behaviour and decision-making are critical when designing robots that interact with people. These models not only help robots to understand and predict a user's choices and responses to the robot's actions but are also a key element when a robot is learning from human demonstrations and feedback. Most existing work assumes that human users behave in a near-optimal manner. However, in practice, modelling users as near-optimal is insufficient and can result in arbitrarily large errors during robot learning.

This project aims to explore offline reinforcement learning approaches where learning is done exclusively from static datasets of previously collected interactions, to build models that capture suboptimal behaviour due to factors such as cognitive biases, lack of information or limited cognitive resources. The resulting models will be evaluated in applications such as reward inference, robot learning, and human-robot interaction.

Relevant references

Hong, Joey, Anca Dragan, and Sergey Levine. "Learning to Influence Human Behavior with Offline Reinforcement Learning." *arXiv preprint arXiv:2303.02265* (2023).

Prerequisites

Candidates in Year 3 or later are preferred. Experience with Python, deep learning and deep reinforcement learning is required.

Additional Information

Applicants may be required to attend an interview.