AI & Robotics Project Proposal

Project Title: Table-top task completion with Deep Reinforcement Learning

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Project Category/Topic:

- AI or Robotics

Project Aim:

- Goal: To explore the application of DQN in a simulated table-top environment.
- Significance: It explores control of objects in a simulated environment.
- Relevance: reinforcement learning, deep neural network, robotics.

Related work:

1. Playing Atari with Deep Reinforcement Learning, Mnih et al, 2013.
2. Prioritised Experience Replay, Schaul et al, 2015.
3. Deterministic Policy Gradient Algorithms, Silver et al, 2014.
4. Answering Visual What-If Questions, Wagner et al, 2020.

Project Objectives/Deliverables:

1. Present sufficient knowledge on the basic theory and methods of RL.
2. Frame the problem as a solvable deep RL problem.
3. Implement the algorithms and solve the problem.

Methodology:

- Research and testing.

Project Plan:

- Feasibility: The project requires basic knowledge of deep reinforcement learning.
- Resources: N/A.
- Proposal week 1 - First Draft week 6 - Presentation week 10 - Final week 12.

Risks and Contingency Plan:

- Failure of the code implementation could prevent reaching the project objectives.
- The formulation of problem model is particularly difficult aspect of the project.
- The contingency plan is to replace the environment with a pre-built library.

Hardware/Software Resources:

- PyBullet physical engine.

Data:

- N/A.