

# Thesis Progress Form

## CHARLES DARWIN UNIVERSITY

### College of Engineering, IT, and Environment

**Name:** Shane Reynolds

**Unit:** ENG720

**Title:** Automatic generation control of a two area power system using deep reinforcement learning

**Supervisors:** Charles Yeo & Stefaniya Klaric

**Time & Date:** August 4, 2020 @ 1pm

## 1 Progress since last meeting

- Investigated priority experience replay, which provides a metric describing the usefulness of each experience tuple collected by the agent during training. This was a technique that was used by a research group in Singapore, which seemed to improve the performance of the agent.
- Ran an experiment for 20000 episodes using the standard original DDPG implementation. The result did not show any material improvement over training the agent.
- Implemented a prioritised experience replay memory system for the agent and ran an experiment for 10000 episodes. Experiment has not yet concluded at the time of the meeting.

## 2 Discussion Points

- Outlined recent progress to CY, as described above.
- Asked CY if there was any feedback regarding the thesis document. CY acknowledged that existing document does not need any improvement.



### 3 Plan until the next meeting

- Assess agent performance upon conclusion of the most recent experiment using priority experience replay and assess if the implementation of a supervised learning using training data from a tuned PID controller will need to be used.
- Reach out to research group in NTU to obtain better ideas on the approach taken to achieving performance gains over standard PID control.

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**Supervisor**

August 4, 2020