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 & Stefanija Klaric

Time & Date: 28/07/2020 @ 11am

1 Progress since last meeting

- Minor changes to literatures review
- Found a second year PhD student at research group at Nanyang Technological University in Singapore who is undertaking the same research. The link to the research group is here. The student recently published a paper in IEEE which mentions it is very difficult to train a neural network to control the frequency of a multiarea power system using DDPG from scratch. The student instead captured data, in simulation, of tuned PID frequency control of a two area power system. The data was then used to pre-train the neural network using a supervised learning approach. This provided the model with a starting point. DDPG was then used on the pre-trained model to optimise further - the results show that the DDPG optimised neural network controller outperforms PID.

2 Discussion Points

- Meeting did not occur this week

3 Plan until the next meeting

- Run experiment for 20000 episodes to see if model performance improves with additional training
- Implement priority experience replay to see if there are additional gains in agent performance
- Investigate how a supervised learning might be implemented to pre-train the model

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Supervisor

August 1, 2020