Project Proposal - Group 3

1) The names of the people in the group.

Chieh-Ju Wu, Daniel Grönås, Fredrik Mazur and Niclas Määttä.

2) A working title for the project.

U-net network segmentation for brain MRI images.

3) A brief description of the problem

Referring to [U-Net: Convolutional Networks for Biomedical Image Segmentation](), our objective is to utilise the U-net structure, implement it into the [Brain MRI segmentation]() dataset and differentiate between normal brains and brains with tumor(s).

4) The training data that you will use for training, validation and testing.

https://www.kaggle.com/mateuszbuda/lgg-mri-segmentation

5) The deep learning software package(s) you will use.

In this project U-net will be implemented with Pytorch.

6) How much of the software implementation your group will write.

The intention of the software implementation is to take proven concepts and test it on a different data set. Since the Pytorch software will be used, the neural network will be set up with this software.

7) The initial set of experiments you will run.

1. He initialisation to make the Network parameters less sensitive to its initial value
2. Batch normalization to increase the training speed
3. Implementing cycling learning rate or ADAM decreasing learning rate
4. Dropout neurons (maybe)

8) How you will measure the success of your project.

A high test score >90% and by comparing results of previous projects.

9) Specify for each group member the skills/knowledge they aim to acquire from completing the project.

[Skills/knowledge]
Daniel: No prior knowledge.

Fredrik: One course in Reinforcement Learning (EL2805), but besides that not much.

Chieh-Ju: Bachelor project with supervise ML & EL2805 (Reinforcement Learning)

Niclas: Pretty much no previous knowledge, this is my first course regarding machine/deep learning. Been using pre-built algorithms like YOLO and implemented them using ROS previously.

[Aim to acquire]
Daniel: Acquire knowledge in deep learning and obtain the basic skills for continuous learning.

Fredrik: Get a better understanding of implementing neural networks in pytorch and learn more about deep learning programming.

Chieh-Ju: More knowledge on CNN in pytorch, experiences with big medical dataset

Niclas: Getting more knowledge on how to use a machine learning library like pytorch, and getting an overall better understanding about neural networks and in particular U-nets which will be the main part of this project.

10) The grade your project group is aiming for in the range A-E.

A