HV Group 05 (Dr. Hugh Hunt) **Week 5** 2019/08/12 - 2019/08/17

Lightning Event Classification with Deep Learning

Tyson Cross 1239448, Jason Smit 709363

Progress report:

- Created per sequence image masks (Nuke)
  %14 (29595/216635 images) / 69 events)
- Created a mechanism to segment a video into events
- Implemented a method to determine the direction of the lightning based on clustering
  (DBSCAN)
- Selected a method to determine the duration of a strike and present the events' information
- Implemented and tested new network - U-net
- Experimented with Networks
  - Deepnet with median filter and/or contrast enhancer
  - Unet randomised weight training
  - Unet pretrained
- Cleaning up repo and preparing the project for handover
  - Refactored training mechanisms
  - Altered pipeline to reduce data processing
- Working on augmenting the exposures for the data to increase the systems sensitivity to dim events.

Agenda:Problems:

- Performance issues
- Training is slow with additional data
- Directionality not robustly tested
- Low/high variance in data

Plan for next week:

- Integrate the directionality and event information tools into the application
- Produce an output file with information about the input file
- Produce graphics for the open day
  - Network
  - Cluster technique
  - Overall system diagram
  - Videos
  - Overall segmentation example