HV Group 05 (Dr. Hugh Hunt) **Week 4** 2019/08/04 - 2019/08/10

Lightning Event Classification with Deep Learning

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Progress report:

- Created per sequence image masks (Nuke)
  %14 (29595/216635 images) / 69 events)
- Experimented with Networks
- Modified the matlab app
- Created a method to determine the stoke events
- Working on determining the direction of lightning
  - K-mean squared (clustering)
  - Segmented clusters/centroid
  - Derivative of change in amount of lightning
  - LSTM/SVM (time not likely)
- Working on determining the duration of a strike, counting events
- Evaluating the performance given different circumstances
  - Empty frames
  - Fireworks
  - Dark footage
- Implemented and tested additional networks
  - Deeplab : Best performing thus far
  - Segnet : Poor performance
  - U-net not implemented
- Initial Report Structure

Agenda:

Problems:

- Dim flashes not detectable
  - Expose up > More noise?
  - Normalising input footage (computationally intense)
- Determining the direction of flash in a more robust way than using a horizon line crossing
- Upward events are too long (sequence length matching)

Plan for next week:

- Finish strike duration process
- Create working models for direction determination and evaluate the models
- Train networks with different configurations and evaluate the performance
- Implement networks
  - Unet
  - LSTM?