Lightning Event Classification with Deep Learning

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Progress report:
- Export cine to per video/per event image sequences:
    - 40 %
- Create per sequence image masks (Nuke)
    - 6%
- Experiment with Networks (initial transfer learning)
    - Built initial training script and begun first training with VGG16(8S) and AlexNet
    - First results for image classification/segmentation promising
    - Conversion script for RGB pixel based labels to categorical labels.
    - Resizing script
    - Overall MatLab script super structure for image classification
- Training time seems reasonable for now, with reduced training set
- Presentation with machine learning consultancy
    - Q&A
    - Broad speculation on ideas

Agenda:

Problems:
- Data labelling very slow
- Memory issues with large datasets (20k images will not train!)
- Difference in sequence length for up/down lighting: a problem for quality of classification
- Net does not understand exclusivity of labels – hierarchy option?
- Matlab image processing for input images? (Not required from initial results)
- Initial temporal network structure – LSTM with CNN? Feature extraction proposal network? Sequence data structure? Requires more research.

Plan for next week:
- Work with reduced sample from datasets
- Try with simpler labelling/ hierarchical labelling
- Require more variety in data:
    - Continue export cine to per video/per event image sequences
    - Continue with per sequence image masks (Nuke)
- Experiment with different networks and options:
    - Modify output layers of googleNet, InceptionResv2, etc for segmentation
    - Metrics and hyperparameters for networks
- Setup environment variable to define project root paths (allows running in different environments/machines)
- Interleaving training/validation/test technique (random shuffling data not optimal)