

Week 2 Progress 28/06

29 JULY 2019 / 2:30 PM / EIE Seminar Room

ATTENDEES

Group 05: Tyson Cross (Chair), Jason Smit (Minutes)

Group 09: Graeme Young, Marco Zahra

Group 24: Treasure Tamme, Kopantsho Mathafa

Group 39: Esanthan Naidoo, Tashveer Soorju

Group 44: Ndivhuwo Maswoba

Dr. Hugh Hunt, additional staff and supervisors to be noted

AGENDA

Last Meeting Follow-up/Group 1 co-meeting

1. Received the minutes from the last meeting, thank you Group 44

Completed from Last Week:

1. Group 09:

- a. Finalised horn design
- b. Constructed horns
- c. Rudimentary testing of horns
- d. Constructed mounting brackets
- e. Worked on noise sources

2. Group 39:

- a. Partial design of induction motor for internal fault simulations were established by using a sample model of a synchronous machine and adjusting its d-q parameters.
- b. AC supply now powers the motor protection relay using twin flexes.
- c. Thermal model was studied and it was found that the power losses in the stator and rotor will need to be modelled with thermal resistances and capacitors. The important components required to develop the thermal model were found.

3. Group 44:

- a. Interfacing RTDS to external hardware achieved when redoing the ELEN4018 Lab. The idmt relay connections were done successfully. The relay trip signal was successful sent to the I/O of the RTDS.
- b. The power amplifier Omicron CMS 156 was successfully connected to the IDMT relay
- c. Familiarizing with settings of the SEL-321 distance relay
- d. Simulation of the transmission line with series compensation

4. Group 05:

- a. Export cine to per video/per event image sequences: 40%
- b. Create per sequence image masks (Nuke) 6%
- c. Built initial training script and begun first training with VGG16(8S) and AlexNe (transfer learning)
- d. Initial image segmentation results promising: ~90% accurate
- e. Conversion script for RGB pixel based labels to categorical labels.
- f. Resizing scripts
- g. Overall MatLab script super-structure for image segmentation
- h. Training time seems reasonable for now, with reduced training set
- i. Presentation with machine learning consultancy:
 - Q&A, useful but broad speculation on ideas

New Business (Challenges)

5. Group 09:

- a. Designing the noise sources and comb generators for the S-band frequency range
- b. Designing a clock oscillator capable of producing a squarewave at a frequency in the S-band (2-4 GHz) from a closed unit device (without the aid of a function generator)
- c. Understanding the VNA
- d. Standard mounts for the devices
- e. Construction of the horn

Group 39:

- f. Estimating key parameters for a high voltage induction motor equivalent circuit are troublesome: lab experiments have only been carried out with low powered motors in Genmin.
- g. The SEL-710 motor protection relay configuration requires ports that are not available for connection to the OMICRON amplifier.

- h. In addition, a software called SEL-5030 ACCELERATOR QuickSet is required for setting trip times and voltage and current limits for the relay to respond to.

6. Group 44:

- a. Problems encountered when connecting the SEL-321 relay that lead to some relay components damaged. This has led to change in project scope

7. Group 05:

- a. Data labelling very slow process
- b. Memory issues with large datasets (20k images will not start training)
- c. Difference in sequence length for up/down lighting: a problem for quality of classification
- d. Net does not understand exclusivity of labels
- e. Initial temporal network structure: Requires more research.

8. Roster for remaining Meetings Group rotation for chairing

- a. **Chairing for Monday 5th August 2:30 meeting:** vote/volunteering
- b. **Chairing for Monday 12th August 2:30 meeting:** vote/volunteering
- c. **Chairing for Monday 19th August 2:30 meeting:** vote/volunteering
- d. **Meeting on Monday 26th August?** Day before staff inspection

9. Reminder to submit progress reports by Saturday 3rd August midday

10. A full list of per group project supervisors would be useful for meeting minutes

AGENDA FOR NEXT WEEK

1. Group 09:

- a. Finish construction of Noise sources and Comb generator
- b. Build all devices
- c. Automatic control of rotator
- d. Remote readings using VNA
- e. Rudimentary testing of constructed devices
- f. Confirmation of design of horn antenna
- g. Revival of the rotator software

2. Group 39:

- a. Download ACCELERATOR QuickSet software
- b. Complete equivalent circuit model and hence thermal model on paper
- c. Investigate and model in RSCAD, alternatively model in block diagram format in MATLAB, and then use the CONVERT component in RSCAD to convert it into RSCAD format so it can be run through the RTDS.

3. Group 44:

- a. The project will be done on RSCAD only
- b. Simulation of a DPR on RSCAD
- c. Line-to-Ground and Phase-Phase fault simulations

4. Group 05:

- a. Work with reduced sample from datasets
- b. Try with simpler labelling/ hierarchical labelling
- c. Require more variety in data:
 - i. Continue export cine to per video/per event image sequences
 - ii. Continue with per sequence image masks (Nuke)
- d. Experiment with different networks and options:
 - i. Modify output layers of googleNet & InceptionResv2
 - ii. Metrics and hyperparameters for networks
- e. Setup environment variable to define project root paths
- f. Interleaving training/validation/test technique (random shuffling data not optimal)

NOTES

- **Group 24** has not submitted a progress report for the week, not included on formal agenda for the meeting