Please answer only the questions about the paper you were allocated (this will NOT be the paper you presented, see email).

The mark of your answers to the questions will form one part of the mark. The total mark for assignment 2 will be the average between this mark and the presentation mark.

Note, you are encouraged to talk to members of the group that presented the paper. The write-up of the answers needs to be independent, however.

The deadline is March 30.

**Yamins**

1. What is the HMO model and what is boosting?
2. What is key finding and how is this supported?
3. How is model variability compared to the data?
4. Why is it of interest that the Ideal Observer Model scores low on predictivity?
5. The paper finds that parameters with high sensitivity and high heterogeneity are important. Why could that be?

**Krizhevsky**

1. What is the key finding of the paper?
2. How is over-fitting countered? Is over-fitting a problem for the brain as well?
3. Why is drop-out turned on during training but off during the test phase?
4. What is the objective function used for training the network (equation please)?
5. At a Halloween party, it would presumably be easy to confuse a trained network, confusing cats and grandmothers. What strategies do humans employ to make object recognition more robust?
Furber

1. What does the Spinnaker project try to achieve?

2. How are neurons modeled? How would one, say, model synaptic plasticity?

3. It is argued on the first page, second column that the interesting scale in the brain is that between small networks (10^2-100 neurons) and large brain regions (millions of neurons). Do you agree?

4. What is AER?

5. Is the communication synchronous or asynchronous? Why is this communication mode chosen?

6. What would you think is the hardest problem if you want to simulate a piece of cortex with the Spinnaker system?

Eliasmith

1. Is it important that the neurons are spiking, or could everything have been done with rate neurons?

2. How is learning implemented in the model? How would one train the model on a new task?

3. How does the task change the computation that the network is doing?

4. It is claimed that the network is unique that it is as fast as humans on some tasks. How should one interpret this claim?

Le

1. What is the main finding of the paper?

2. In the discussion of Eq.1 it says “the second term encourages pooling features to group similar features together to achieve invariances.” Explain how the cost function achieves this.

3. Do you think sparseness is important in developing higher order representation? Why?

4. Think of another way to measure the receptive fields of the output neurons of the network and discuss its (dis)-advantages.

5. Discuss the plausibility of the system as a model of biological learning.