Y4 Project meeting 11 record (Semester 2 Week 1)

Date and time: 13/01/20, 14:05-16:30

Attended by: Guy, Harry and Hin

Discussed:

1. Seminar advice

- backup slides to handle questions that address details not covered in talk
- discussion on how to handle explaing PGMs
- give credit to person who did the work e.g. Hin's results from HBM
- Make sure to reference specific information taken from a paper, especially graphs/tables

2. Discussion of HBMs and Bayesian Inference

- PGMs
- dealing with problems of HBM exploring unphysical parameter space by enforcing stricter priors on the important parameters e.g. age.
- Guy talked about some code

3. Machine Learning

- dropout seems easier to tune than L2 regularization.
- MSE seems to be better during the training than MAE.
- instead of relu we could use elu to give less 'spiky' neural nets.
- Variational inference = approximates posterior using sophisticated minimization technique.

4. Discussion of project overview

5. The next stellar grid

- M67 grid points will be added in due time
- When training on the grid just train on solar metallicity and 0.001 about that metallicity.
- Same for helium
- Constrain age to maybe 1gyr – 8gyr

6. Paper that has formulism for predicting how neural net error changes as a function of architecture+data augmentation.

To do:

Students:

- consider doing 2-step neural net training: 1st step with MSE, 2nd step with MAE
- potentially train with google collab
- think about whether it would be beneficial to meet with the head of data science at some laboratory who is coming ot the university on the 2nd March.
- keep in mind working with eclipsing binaries.

Hin: (post seminar)

- do more HBM work (hopefully sorting out bias issues)
- potentially try working with clusters with more stars.

Harry: (potentially post seminar)

- debug his neural network
- test using dropout instead of L2 regularization
- maybe work with the formulism for how error changes with architecture.

Guy to do:

- send slide you use to explain PGMs
- potentially allow students to train using Blue Bear.

- send us the paper that has a list of “locally quadratic activation functions”, and the paper that says

Next meeting: 20/01/20 (Mon) 14:00 in Guy’s office

Recorded by: Harry