

# Review of the Dissertation Thesis

## Hybrid Deep Question Answering by Ahmad Aghaebrahimian

The dissertation thesis aims to investigate effects of deep learning methods in question answering with main focus to structured factoid QA and unstructured sentence level/world level QA.

The thesis is well structured and written. In the theoretical part, there is nice and compact introduction to all related concepts and methods. State of the art analysis is quite detailed and convincing.

The thesis is very broad and targets several open problems and challenges. It introduces algorithms for three QA problems mentioned above. From my experience introduced architectures make sense, however there is little justification on structural choices in the thesis. One would expect extensive experiments with different architectures in each domain with improvement measured for every component (e.g. with and without attention) independently. When such experiments are performed, it is not clear if results are statistically significant (e.g. Learning curves in Fig. 6.7. - is it just single run or the average from multiple independent runs). This is quite important because neural nets are quite sensitive to initial randomized parameter setting.

Another aspect that can be improved is the reproducibility of results. Often a lot of information is missing. Training of deep networks is not trivial and there are many parameters and regularization techniques to prevent overfitting that need to be used properly. Thesis lack proper level of detail and it is not clear whether which techniques were used and if there was some hyperparameter tuning.

The last point that come to my mind is that I would expect more extensive utilisation of transfer learning. I was able to find GLOVE pre-trained embeddings being used by some models but there are several others and I would like to see the effect on model performance. I know that BERT was introduced after this thesis was published but it would be nice to see some synergies arising from embeddings trained on massive data sets.

The candidate is well oriented in the field, the thesis brings original contributions and the overall quality of the dissertation is good. Therefore I recommend the thesis to be accepted by the evaluation committee,

Prague, Jan 29th, 2019

doc. Ing. Pavel Kordík, Ph.D.