Ikhlas Attarwala
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Applications of NNLMs / Paper 1

**Learning to Compose Neural Networks for Question Answering**
by Andreas, Jacob et al.

This paper proposed at the University of California at Berkeley provides a novel approach to question answering. Their dynamic neural module network uses strings and parameters learned by reinforcement learning to address logical world representations, including answering questions from images and knowledge bases. There are 6 modules that the authors use to assemble and apply knowledge representation and reasoning. These 6 are 'Lookup', 'Find', 'Relate', 'And', 'Describe', and 'Exists'. When evaluating, the corresponding modules are assembled into a full neural network and intermediate results flow between modules until an answer are produced at the root.

When corresponding modules are assembled, a representation task (through LSTM) ranks generated, candidate semantic parses. This was technique was borrowed from a 2014 paper by Berant and Liang. This model assembles a neural network from an inventory of neural models, taking a training corpus of questions, representative world states, and an answer. In conclusion, they stress that their model has achieved so much on their tasks because of the use of (1) continuous representation that improves expressiveness and learnability of semantic parsers (ie. avoid the problem with induction of semantic lexicons by replacing discrete predicates with neural network fragments), and (2) a working, dynamic semantic structure prediction that improves generalization in deep networks. They made considerable gains in speed and sample efficiency, even with little training data