



One-shot Learning with Memory-Augmented Neural Networks

Memory-augmented neural network to rapidly assimilate new data

DEEP LEARNING (DL)RECURRENT NEURAL NETWORKS (RNN)NEURAL TURING MACHINE (NTM)ZERO-SHOT LEARNING

samim

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Theano implementation of the paper One-shot Learning with Memory-Augmented Neural Networks. To try the classification example, download the Omniglot dataset and place it in the data/ folder. Here, we demonstrate the ability of a memory-augmented neural network to rapidly assimilate new data, and leverage this data to make accurate predictions after only a few samples. We also introduce a new method for accessing an external memory that focuses on memory content.



arXiv

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Despite recent breakthroughs in the applications of deep neural networks, one setting that presents a persistent challenge is that of "one-shot learning." Traditional gradient-based networks require a lot of data to learn, often through extensive iterative training. When new data is encountered, the models must inefficiently relearn their parameters to adequately incorporate the new information without catastrophic interference. Architectures with augmented memory capacities, such as Neural Turing Machines (NTMs), offer the ability to quickly encode and retrieve new information, and hence can potentially obviate the downsides of conventional models. Here, we demonstrate the ability of a memory-augmented neural network to rapidly assimilate new data, and leverage this data to make accurate predictions after only a few samples. We also introduce a new method for accessing an external memory that focuses on memory content, unlike previous methods that additionally use memory location-based focusing mechanisms.

Read more...

GitHub

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Read more...

Dependencies:

- python
- numpy
- theano

Links

- <http://www.shortscience.org/paper?bibtexKey=journals/corr/1605.06065>.

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