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| 模型 | 挑战 | 问题 | 文章 |
| Neural Turing Machine | 1. RNN是图灵完备的，理论上可以模拟任何过程（算法），但是实际中是很难完成的。 | 1. 拓展了RNN，能够解决一些算法任务。 2. In contrast to most models of working memory, our architecture can learn to use its working memory instead of deploying a fixed set of procedures over symbolic data.(NTM可以学习到如何使用记忆—读写操作，而不是固定几类操作—栈，队列，等等) 3. It’s design to solve tasks that require the application of approximate rules to “rapidly-created variables 4. 提供寻址机制，用于存储和调用相对简单的原子的数据 5. Variable-binding and Variable-length | Neural Turing Machine |
| Neural GPUs | 1. NTMs are not parallel and are hard to train due to their large depth when unfolded. 2. In its basic form, the entire input is encoded into a single fixed-size vector, so the model cannot generalize to inputs much longer than this fixed capacity. 3. In the best case one would desire a neural network model able to learn arbitrarily complex algorithms given enough resources. 4. NTM use of soft attention requires accessing the entire memory in order to simulate 1 step of computation, which introduces substantial over head | 1. Highly parallel which makes it easier to train and efficient to run(解决了左边提出的各种问题，主要是关于NTM的) 2. This(学习算法) opens the way to use neural networks in domains that were previously only addressed by discrete methods, such as program synthesis | Neural GPUs Learn Algorithms |
| RL-NTM | 1. Many important existing interfaces, such as databases and search engines, are discrete.(除了memory，还有许多外部接口可以使用，比如搜索引擎等，主要是提出不可微的外部接口-离散的外部接口) 2. 离散的接口不能直接使用反向传播训练模型 | 1. Discrete Interfaces. Investigate the following discrete interfaces: a memory Type, an input Type, and an output Type 2. 结合reinforce algorithm解决离散外部接口的问题 3. 不同的看待memory的观点---Interface |  |
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