周报

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1 Proof entailment 任务实验改进

- 对于 Beam search 的过程，用一个 learned state evaluate 模块来代替原来模型中直接基于句子相关性的分数，在 task_1，task_2 上实验结果有所提升. 在 4 项指标上超过了之前该数据集上的研究结果

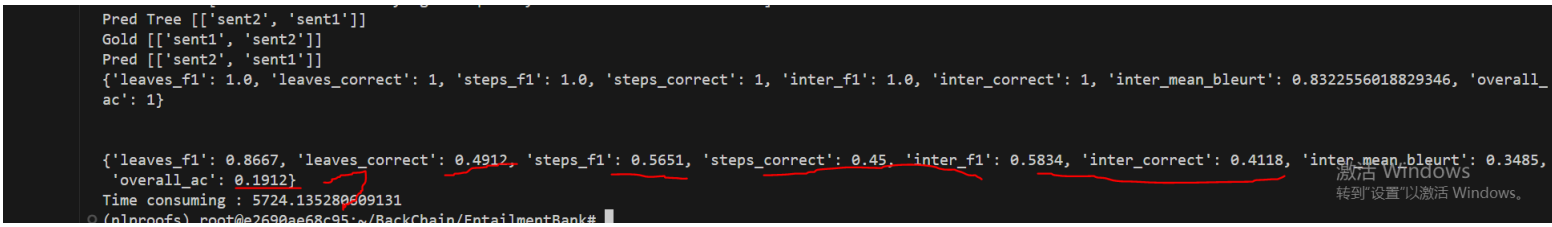

图 1: Results on task1

图 2: Results on task2

- 考虑先把所有的中间结果生成出来，再根据增强的知识集合给出推理过程，正在实验中

2 AI for Math 论文阅读

关于 AI for Math 的文章阅读和整理，综述一篇 + 两类研究方法的相关文献

- 方法 1 结合 ITP 和 ATP 的任务 [1] [2] [3] [4] 等：

  利用机器学习模型学习在给定的状态下预测 tactic 或 proof, 模拟 human 和 ITP 交互的过程，(即在 ITP+human 的 loop 中，用机器学习模型来代替 human), 是以 GPT-f 为首的一类工作的做法，一般来讲可以从

  (1) 生成更高质量的 proofstep

  (2) 设计新的 proofSearch 搜索算法 [4]

  两个角度进行优化

- 方法 2 设计新的合成数据以及方法或者针对数学推理的预训练任务 [5] [6] 等

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[6] Yuhuai Wu, Markus N Rabe, Wenda Li, Jimmy Ba, Roger B Grosse, and Christian Szegedy. Lime: Learning inductive bias for primitives of mathematical reasoning. In Marina Meila and Tong Zhang, editors, *Proceedings of the 38th International Conference on Machine Learning*, volume 139 of *Proceedings of Machine Learning Research*, pages 11251–11262. PMLR, 18–24 Jul 2021.