Project Proposal: Evaluating the Efficacy of "Frankenmodels"

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Objective: This project aims to investigate whether combining multiple instances of language models (LMs) in a pipeline, particularly by duplicating and stacking frozen layers from fully trained models, can enhance performance. The term "frankenmodels" refers to this experimental approach of assembling a new model architecture from existing, pretrained components.

Approach:

1. **Model Preparation:**
    - Utilize fully trained language models as the baseline.
    - Experiment with duplicating specific layers from these pretrained models and assembling them sequentially to form a new model pipeline.
2. **Experimental Design:**
    - Identify which layers from the pretrained models are most beneficial to repeat.
    - Determine the optimal number of times each layer should be repeated to achieve performance gains.
    - Assess the impact of layer repetition on model performance, considering factors such as the size of the original LM. This includes evaluating whether diminishing returns occur as the number of repetitions increases or if there are threshold effects based on the size of the original model.
3. **Evaluation Metrics:**
    - Compare the performance of the frankenmodels against the baseline pretrained models.
    - Analyze improvements in accuracy, efficiency, and other relevant metrics to determine the effectiveness of the layer duplication approach.

Expected Outcomes: The project aims to provide insights into the **potential** benefits of using frankenmodels for enhancing language model performance. It will offer a better understanding of which layers and how many repetitions contribute positively and under what conditions, as well as exploring any diminishing returns associated with this approach.
It is also possible that no increase in performance will be yielded.

Mentored Project: We would appreciate the opportunity to work with a mentor on our project.