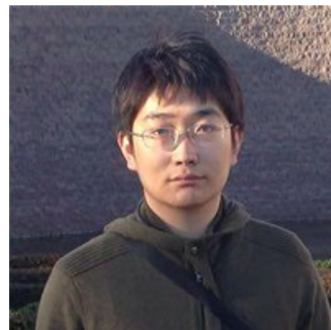


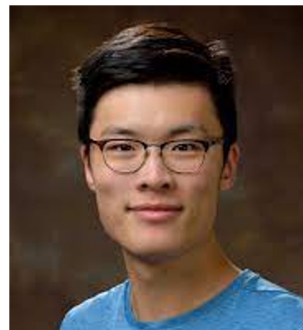
Indirectly Supervised Natural Language Processing



Wenpeng Yin



Muhao Chen



Ben Zhou



Qiang Ning



Kai-Wei Chang



Dan Roth

July 9, 2023

ACL Tutorials

Indirectly Supervised Natural Language Processing





Future Directions

- Developing a better theoretical understanding about why is LLM's self-supervision so effective in supporting multiple NLP tasks
 - Use it to develop better supervision signals
- What needs to be done (in training and in inference) to better support few-shot and zero-shot performance of models?

Generating Good Incidental Signals

Finding Indirect Supervision Signals from A Massive Space of Models/Resources



Retrieving Indirect Supervision from a model hub

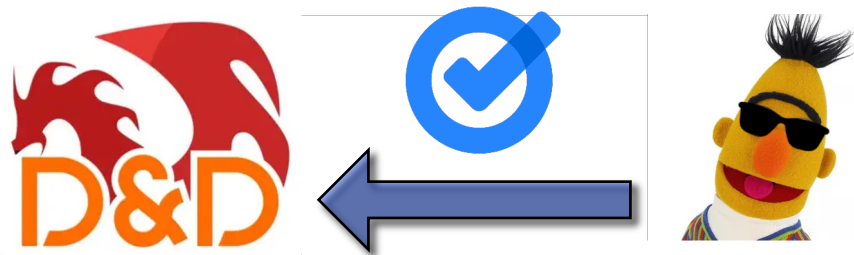
>100k models

Hugging Face

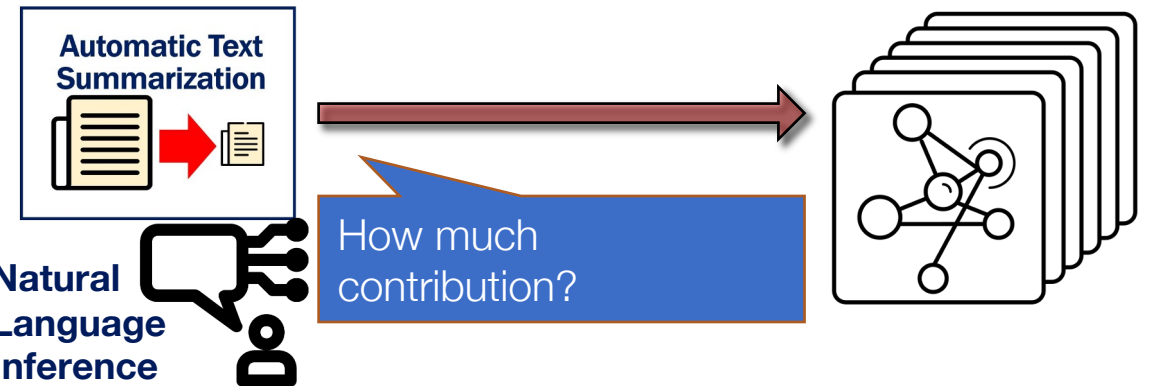
Models 103,814

bert-base-uncased
Updated Nov 16 • ↓ 20.7M • ♥ 387

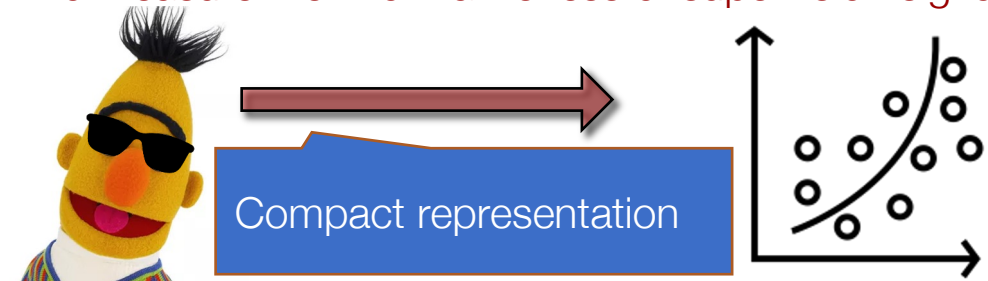
prajjwal1/bert-tiny
Updated Oct 27, 2021 • ↓ 15.8M • ♥ 20



How to efficiently find the *most contributive model* for a *new task*?



① How to measure the informativeness of supervision signals?



② What would be the right “signature” of a model in terms of task-learnability?



③ Identifying and combining models with complementary signals?

- Can we use existing LLMs to generate incidental supervision?

Post-hoc Verification: when are they right?

Effectively Combine Human Feedback

- Build accurate specialized models with distilled parameter sizes
Use LLMs for noise reduction and pattern generation



Algorithmic Approaches



- Currently, Textual Entailment is being used to provide indirect supervision for a range of classification tasks.
 - How can it be used to better support text generation tasks?
- How can this methodology be leveraged to automatically transform anticipated responses into hypothetical statements?
- Textual Entailment/NLI does not transfer well.
 - What is needed to support better generalization across various target problems while minimizing human intervention?

- How to learn to understand a complex scene through indirect signals? For example, recognize people buying food around food truck



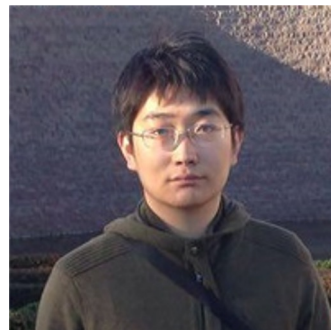
- How to indirectly supervise for compositional generalization and identify visual concepts by analyzing their sub-components (e.g., tell difference between pot and frypan)



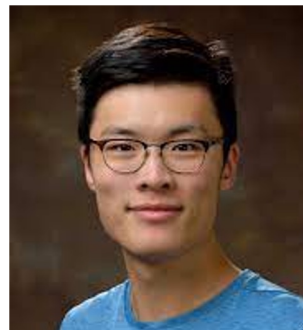
Indirectly Supervised Natural Language Processing



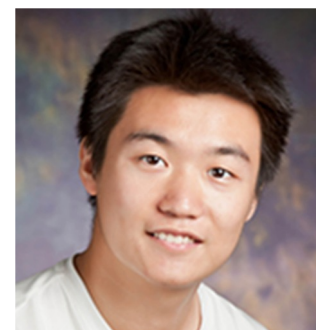
Wenpeng Yin



Muhao Chen



Ben Zhou



Qiang Ning



Kai-Wei Chang



Dan Roth

July 9, 2023

ACL Tutorials

Indirectly Supervised Natural Language Processing

