Super-NaturalInstructions: Generalization via Declarative Instructions on 1600+ NLP Tasks

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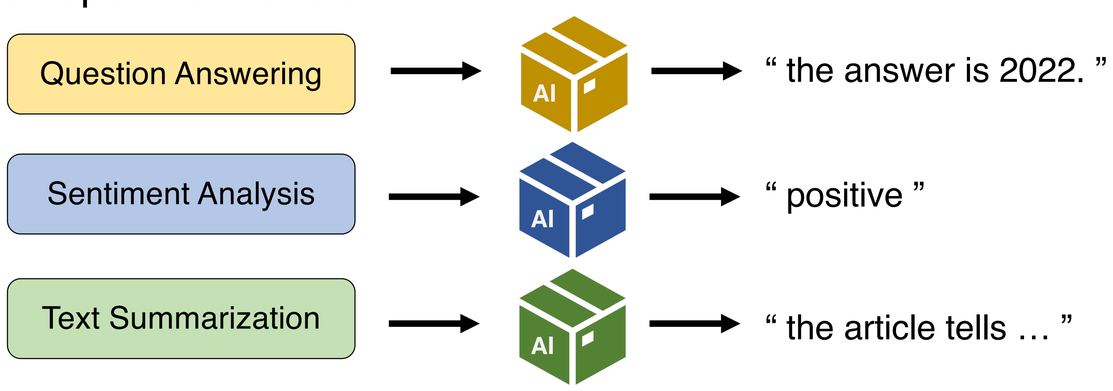
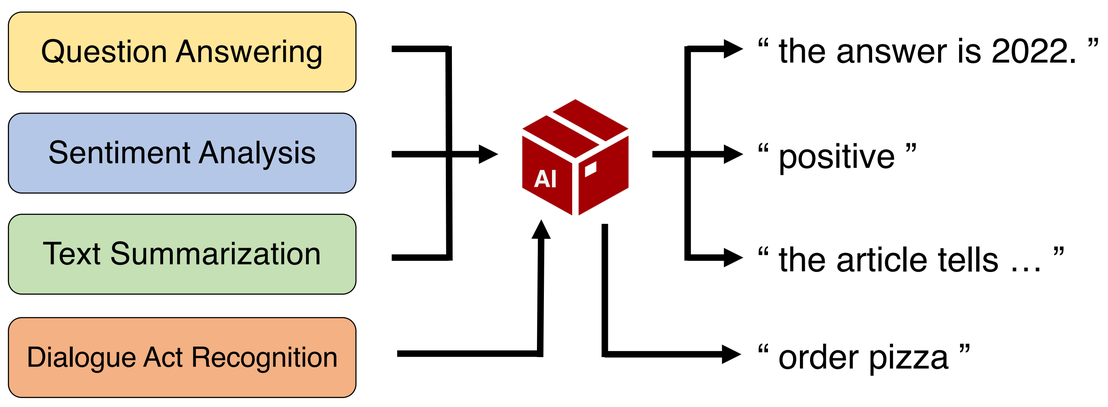
Website

Background

❖ Task-specific Models



❖ General-purpose Model



Large pretrained language models can solve various types of tasks by following in-context instructions.

Instructing Example

Task Instruction

Definition

"... Given an utterance and recent dialogue context containing past 3 utterances (wherever available), output 'Yes' if the utterance contains the small-talk strategy, otherwise output 'No'. Small-talk is a cooperative negotiation strategy. It is used for discussing topics apart from the negotiation, to build a rapport with the opponent."

Positive Examples

- **Input:** "Context: … *'That's fantastic, I'm glad we came to something we both agree with.'* Utterance: *'Me too. I hope you have a wonderful camping trip.'*"
- **Output:** "Yes"
- **Explanation:** "The participant engages in small talk when wishing their opponent to have a wonderful trip."

Negative Examples

- **Input:** "Context: … *'Sounds good, I need food the most, what is your most needed item?!'* Utterance: *'My item is food too'*."
- **Output:** "Yes"
- **Explanation:** "The utterance only takes the negotiation forward and there is no side talk. Hence, the correct answer is 'No'."

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Evaluation Instances

- **Input:** "Context: … *'I am excited to spend time with everyone from camp!'* Utterance: *'That's awesome! I really love being out here with my son. Do you think you could spare some food?'* "
- **Expected Output:** "Yes"

Super-Natural Instructions

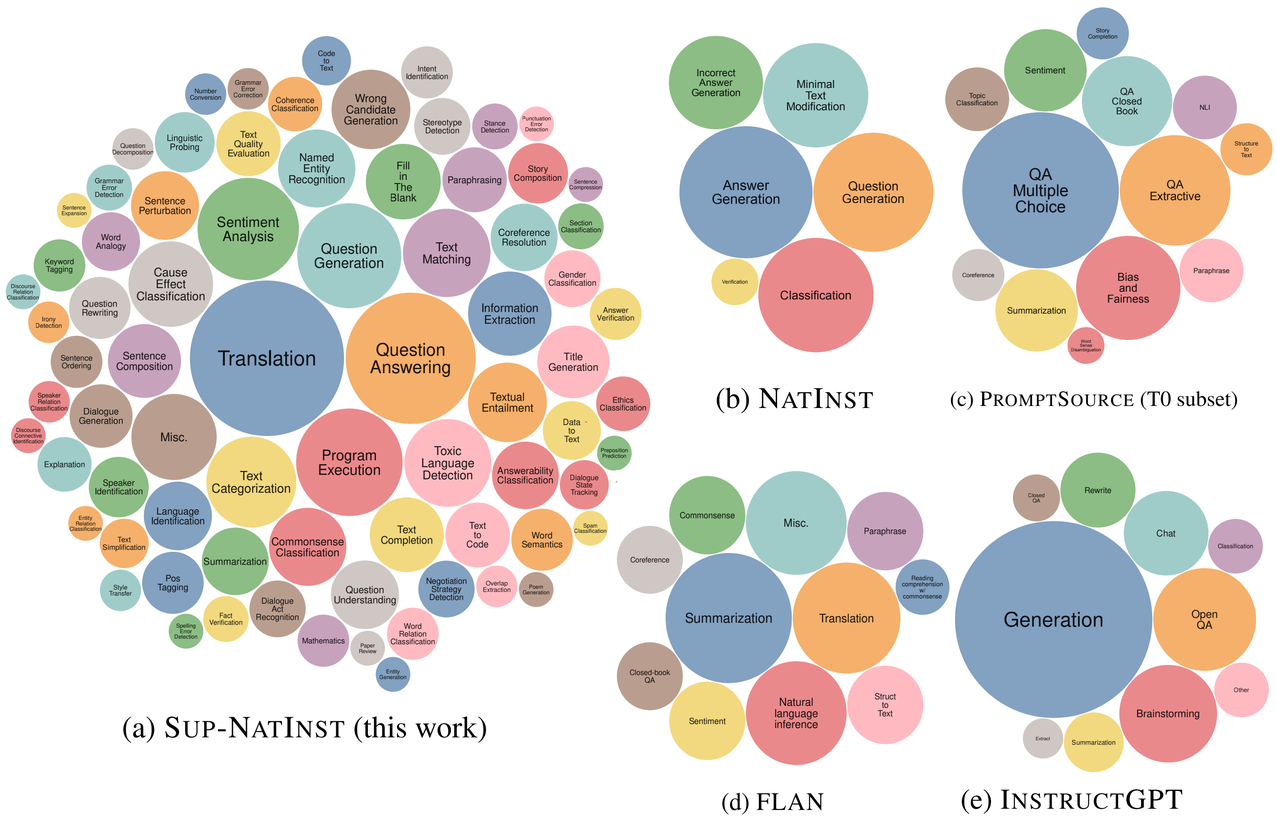
*We collected a diverse set of **1616** NLP tasks and annotated their natural language **instructions**. (see example)*

❖ **How are they collected?**

- Data was contributed by 88 NLP practitioners from the community.
- Instructions were carefully written by these contributors and then reviewed by experts.
- Multiple iterations of editing and review were done via GitHub to ensure quality.

❖ **Why is this dataset unique?**

- Instructions are declarative and informative!
- Diversity: **76** broad categories (see comparison)



(a) SUP-NATINST (this work)

(b) NATINST

(c) PROMPTSOURCE (T0 subset)

(d) FLAN

(e) INSTRUCTGPT

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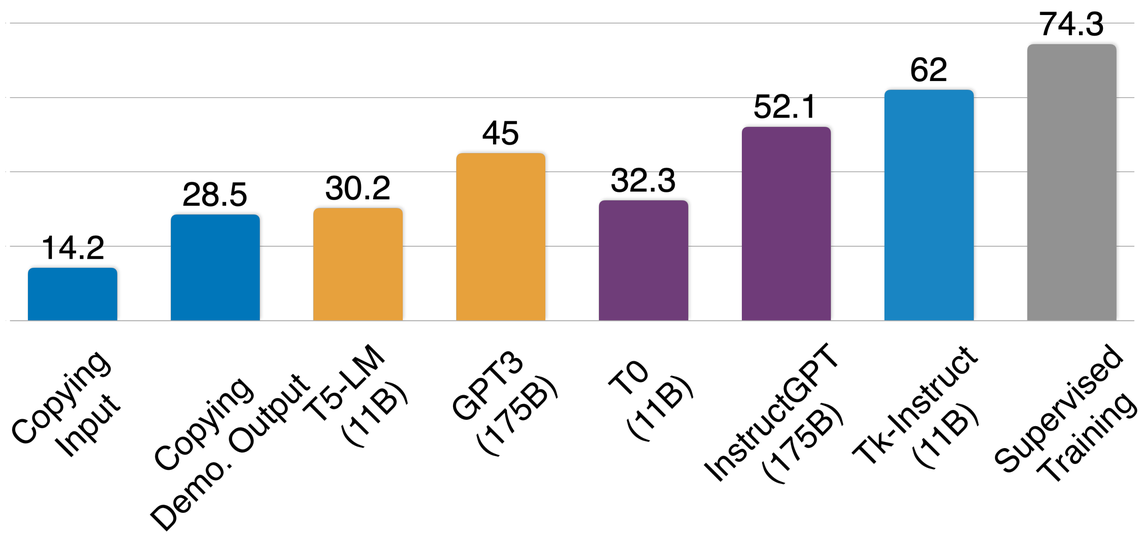
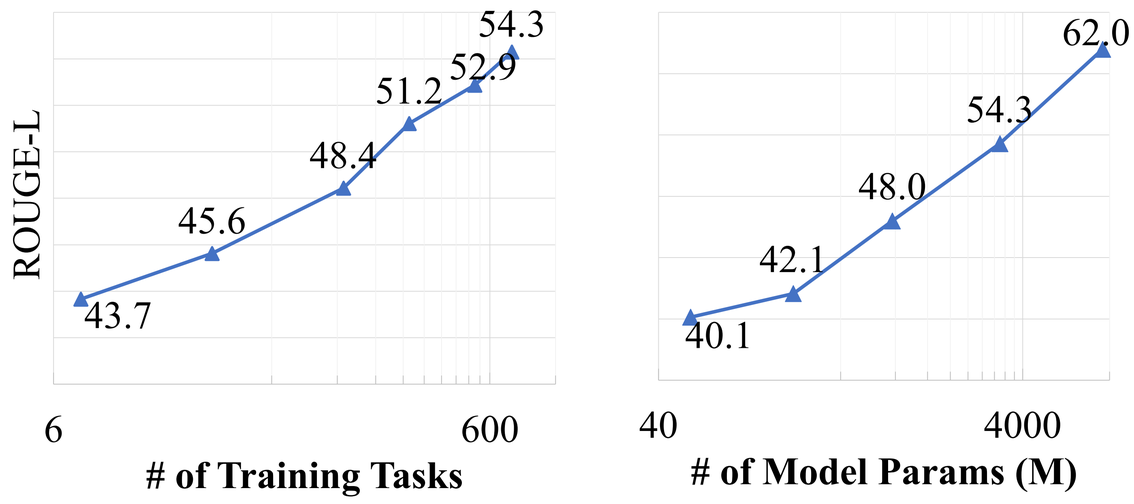
Instruction tuning of T5 model (11B) on our data enables better generalization to unseen tasks than GPT3 (175B).

❖ **Eval setup for cross-task generalization**

- 12 manually picked evaluation categories.
- English track: 119 eval tasks, 757 training tasks.
- Cross-lingual track: 35 eval tasks, 1271 training tasks.



❖ **Scaling trend of generalization**



❖ **Check our paper for more ablations!**

- Definition and in-context examples are complementary.
- A large number of training instances are not necessary.

References:
[1] Mishra et al. "Cross-Task Generalization via Natural Language Crowdsourcing Instructions". ACL 2022.
[2] Sanh et al. "Multitask Prompted Training Enables Zero-Shot Task Generalization". ICLR 2022.
[3] Bach et al. "PromptSource: An Integrated Development Environment and Repository for Natural Language Prompts". ACL 2022.
[4] Wei et. al. "Finetuned Language Models are Zero-Shot Learners." ICLR 2022.
[5] Ouyang et al. "Training Language Models to Follow Instructions with Human Feedback". arXiv preprint 2022.