Controllable Mixed-Initiative Dialogue Generation Through Prompting
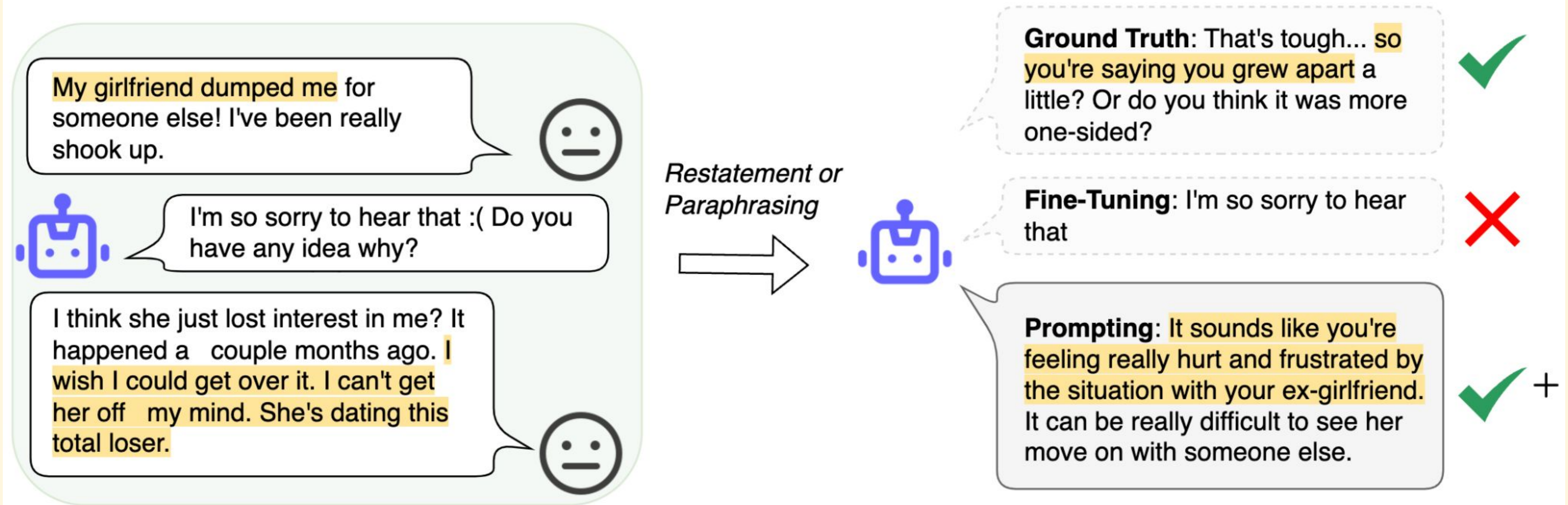
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Replace Smaller Fine-Tuned Conditional Generation Models with Prompting

- **Dialogue policy planning is hard, but that's only half the battle.** There's still no guarantee that the planned conversational strategy will actually get executed! It depends on the quality of a conditional generation model.
- **Fine-tuning conditional dialogue generation models is also really hard.** There's often tradeoff between learning to generate coherent dialogue responses and learning strong semantic control.
- **Fine-tuning on crowdsourced data is a bottleneck by definition.** Many complex dialogue tasks require expert-level domain knowledge (e.g., persuasive strategies, emotional support) which results in various annotation errors that can get propagated through the training process.
- **Is few-shot prompting the solution?** It doesn't depend on supervised data, and the capacity of LLMs is much greater than prior fine-tuned models. This can mean strong semantic control and coherence.

Example Prompt Construction

Prompting versus Fine-tuning and Ground Truth

Corpus	Metric	FT	GT	Prompt
ESC	Accuracy	0.81	0.85	**0.88***
	Coherence	3.57	3.57	**3.72**
	Consistency	3.63	3.60	**3.80**$^{+*}$
	Engagingness	3.55	3.61	**3.81**$^{+*}$
	Distinct-3	0.89	0.90	**0.90**
	Distinct-4	0.87	0.90*	**0.91**$^{+*}$
	QuantiDCE	**3.25**	3.03	3.19
	Win Rates			
	v. FT		**0.56**	0.52
	v. GT	0.44		**0.64***
	v. Prompt	0.48	0.36	
P4G	Accuracy	0.88	0.83	**0.89**
	Coherence	3.66	3.58	**3.83**$^{+*}$
	Consistency	3.69	3.56	**3.71**$^{+}$
	Engagingness	3.62	3.52	**3.69**$^{+}$
	Distinct-3	0.87	0.88	**0.89**
	Distinct-4	0.88	0.88	**0.88**
	QuantiDCE	3.16	3.09	**3.24**$^{+}$
	Win Rates			
	v. FT		0.56	**0.59***
	v. GT	0.48		**0.55**
	v. Prompt	0.41	0.45	

- **Prompting InstructGPT consistently outperforms fine-tuning *and the ground truth responses*** on both *Persuasion4Good* and *Emotional Support Conversations*

Paper