

Thank you BART! Rewarding Pre-Trained Models Improves Formality Style Transfer

Huiyuan Lai, Antonio Toral, Malvina Nissim
CLCG, University of Groningen / The Netherlands

What is formality style transfer?

- Converting an informal text to formal (or viceversa)

Informal: I've watched it and it is AWESOME!!!!

Formal: I viewed it and I believe it is a quality program.

- Evaluation

Style Strength: pre-trained style classifier

Content Preservation: BLEU

Overall: the harmonic mean (HM) of style accuracy and BLEU

Motivation

- How to optimize pre-trained models for content and style?
- Which pre-trained model is more appropriate for formality transfer?
- How much training data do pre-trained models need to achieve competitive performance?

Formality Dataset: GYAFC

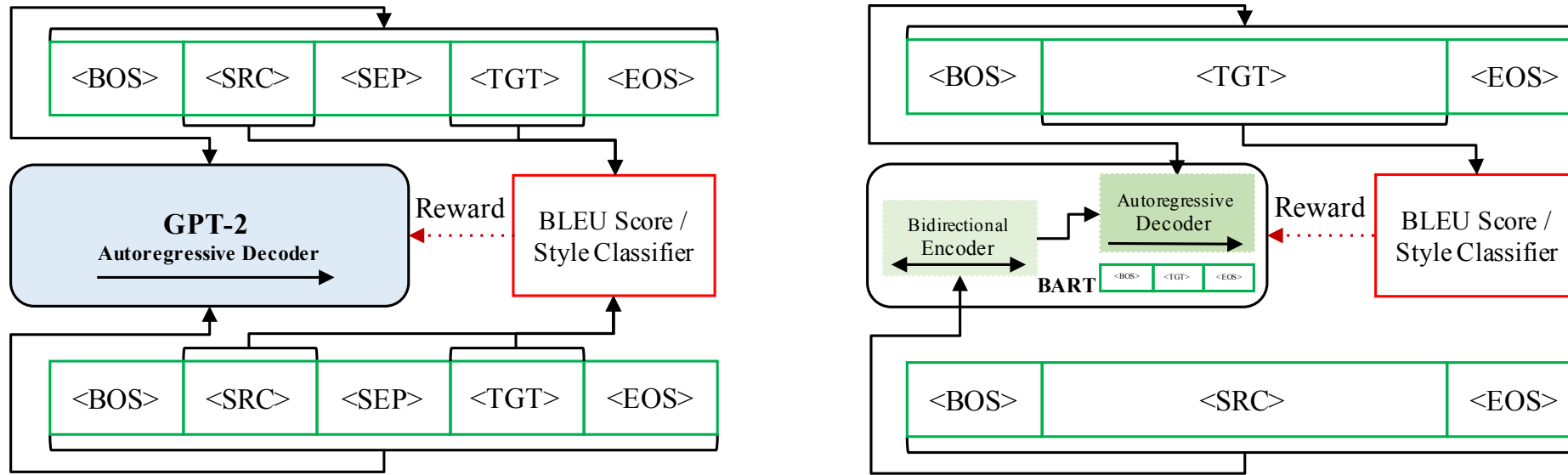
- GYAFC: training pairs for two domains: Entertainment & Music (E&M) and Family & Relationships (F&R).

		Informal → Formal		Formal → Informal	
Domain	Train	Valid	Test	Valid	Test
F&R	51,967	2,788	1,332	2,247	1,019
E&M	52,595	2,877	1,416	2,356	1,082

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LM (GPT-2) based and seq2seq (BART) based model



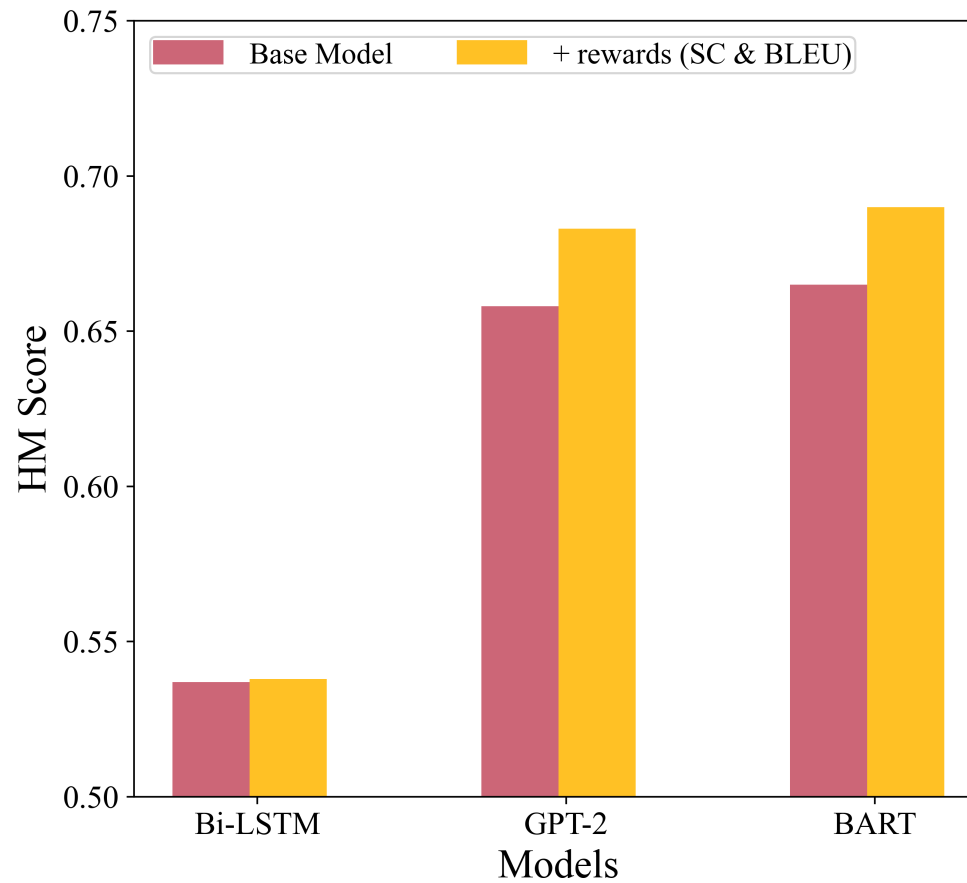
BLEU Reward: BLEU score between the model output and target sentence

SC Reward: classification confidence of the model output

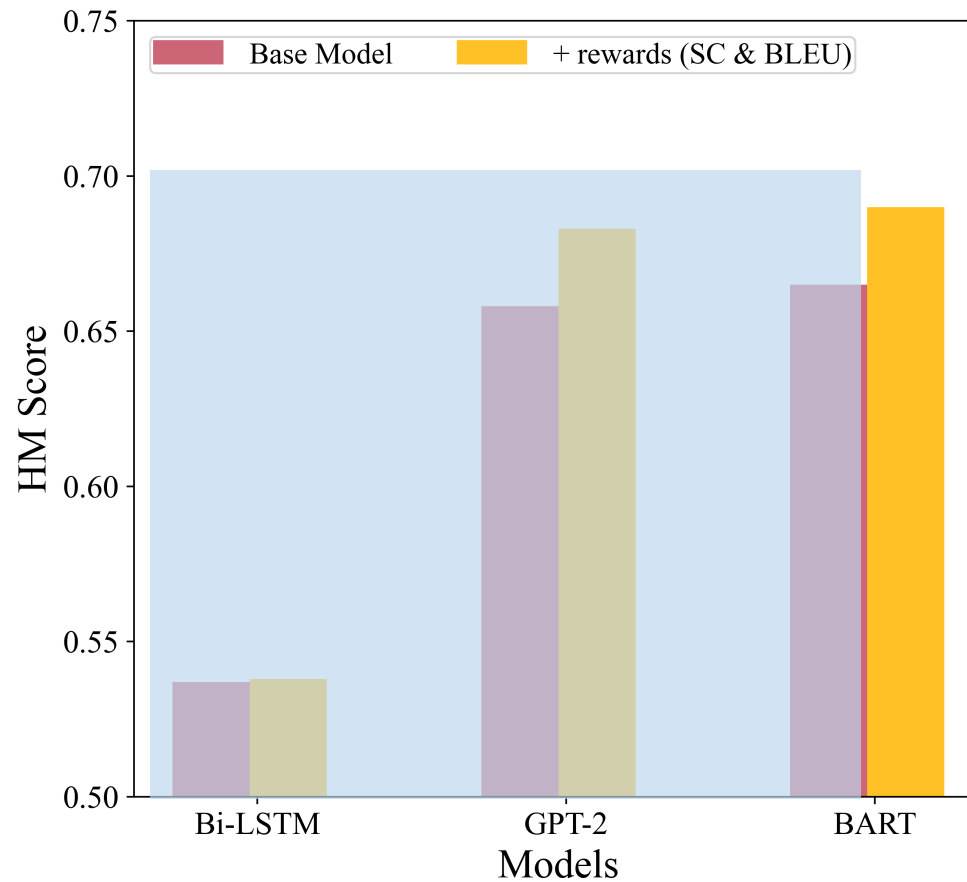
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Overall performance



Overall performance

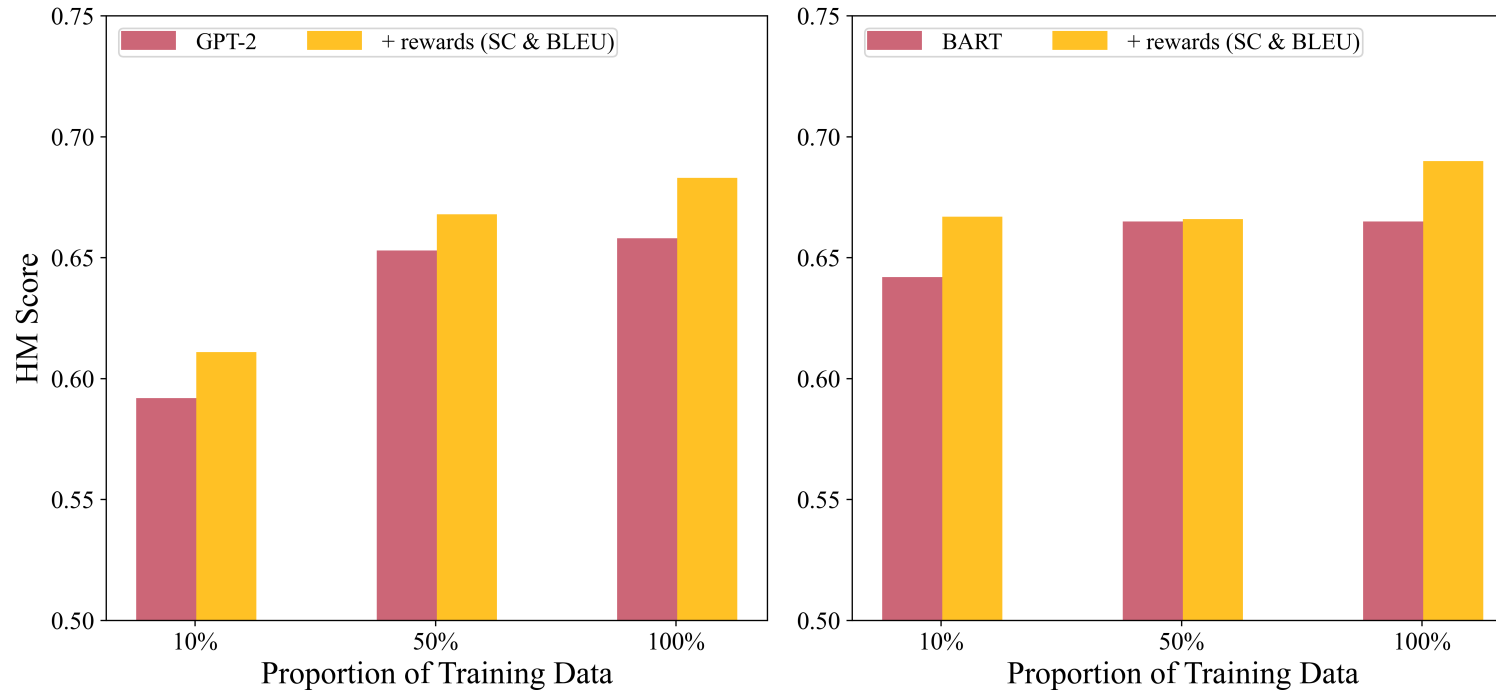


**Our model (BART + Rewards)
achieves a new state-of-the-art.**

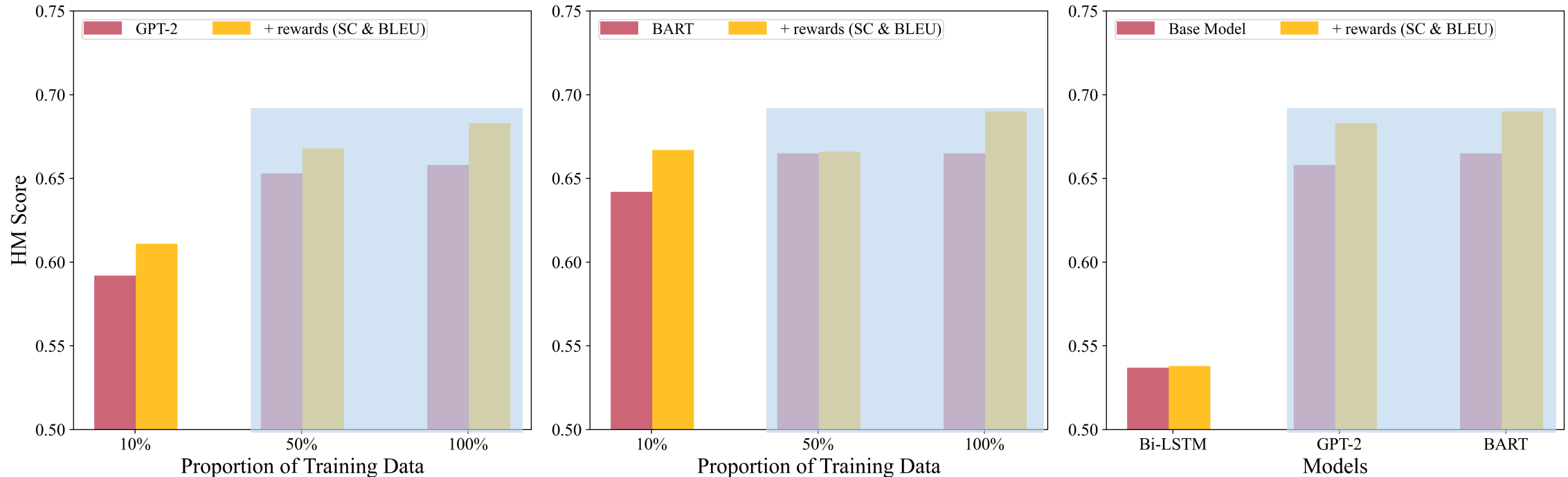
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Model performance of different train set sizes



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Conclusion and future work

- Fine-tuning pre-trained models proves a successful strategy for formality style transfer, thereby reducing the need for parallel data.
- For the two core aspects of this task: 1) BART is better than GPT-2 in content preservation; 2) GPT-2 is often better than BART in style strength.
- Overall, a seq2seq pre-trained model (BART) outperforms a language model (GPT-2), and with the addition of rewards achieves new state-of-the-art results.
- Human evaluation is needed to get a better understanding of the different behaviour of BART and GPT-2.

Thanks for your attention!



@HuiyuanLai @_atoral @MalvinaNissim @GroNlp



huiyuanlai.l@gmail.com



<https://arxiv.org/pdf/2105.06947.pdf>

Paper Link



<https://github.com/laihuiyuan/Pre-trained-formality-transfer>

Code Link