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arXiv:2202.06417 (cs)

[Submitted on 13 Feb 2022 ([v1](https://arxiv.org/abs/2202.06417v1)), last revised 26 Sep 2022 (this version, v3)]

Title:A Contrastive Framework for Neural Text Generation

Authors:[Yixuan Su](https://arxiv.org/search/cs?searchtype=author&query=Su,+Y), [Tian Lan](https://arxiv.org/search/cs?searchtype=author&query=Lan,+T), [Yan Wang](https://arxiv.org/search/cs?searchtype=author&query=Wang,+Y), [Dani Yogatama](https://arxiv.org/search/cs?searchtype=author&query=Yogatama,+D), [Lingpeng Kong](https://arxiv.org/search/cs?searchtype=author&query=Kong,+L), [Nigel Collier](https://arxiv.org/search/cs?searchtype=author&query=Collier,+N)

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> Abstract:Text generation is of great importance to many natural language processing applications. However, maximization-based decoding methods (e.g. beam search) of neural language models often lead to degenerate solutions -- the generated text is unnatural and contains undesirable repetitions. Existing approaches introduce stochasticity via sampling or modify training objectives to decrease probabilities of certain tokens (e.g., unlikelihood training). However, they often lead to solutions that lack coherence. In this work, we show that an underlying reason for model degeneration is the anisotropic distribution of token representations. We present a contrastive solution: (i) SimCTG, a contrastive training objective to calibrate the model's representation space, and (ii) a decoding method -- contrastive search -- to encourage diversity while maintaining coherence in the

> generated text. Extensive experiments and analyses on three benchmarks from

> two languages demonstrate that our proposed approach significantly

> outperforms current state-of-the-art text generation methods as evaluated by

> both human and automatic metrics.

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