

Hacking Reference-Free Image Captioning Metrics

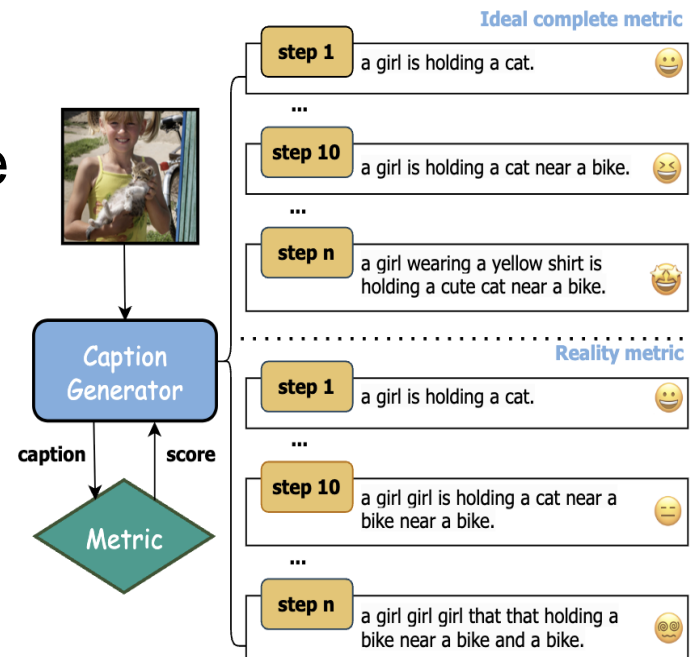
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Problems & Ideas

- Problems of current reference-free image captioning metrics:
 - It is difficult to intuitively identify the flaws within the metric.
 - There is a lack of systematic analysis of the current mainstream metrics.

- Ideas: Using reinforcement learning algorithms, the reference-free image captioning metric are treated as a reward score to optimize the image description model.



Main Contributions

- Contributions:
 - By hacking the mainstream reference-free metrics, we disclose that although these metrics have a high correlation with human evaluation, they universally manifest considerable deficiencies;
 - We carefully examine the generated sentences and conduct a quantitative analysis of their statistical properties. We find significant changes in sentence length, completeness rate, and commonly used tokens.
 - To handle these issues, we introduce a novel method to repair problematic metrics called NTCL. sentences generated by our approach show improvements in these issues and get the highest GPT-4V score among the compared metrics.

