

Controlled Generation with Prompt Insertion for Natural Language Explanations in Grammatical Error Correction





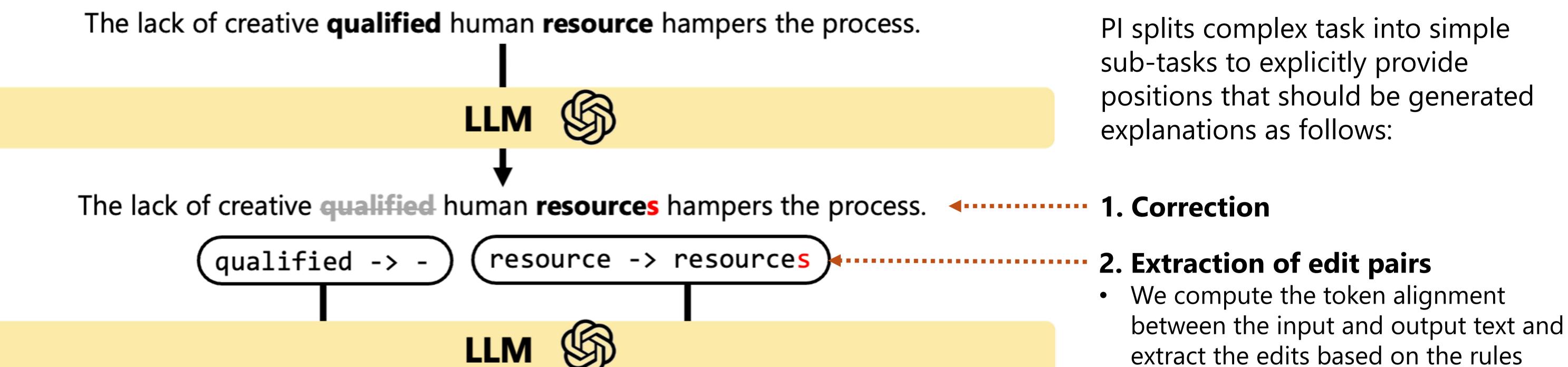
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Introduction

- In GEC, it is crucial to ensure the user's comprehension of a reason for correction
- Existing studies do not directly explain why the correction is needed
- Generating such explanation is not simple even for LLMs due to its complexity
 - Aligning input and output tokens -> identifying correction points ->presenting corresponding explanations consistently
- We introduces (1) a method controlling generation with Prompt Insertion (PI) and (2) create an Explainable GEC (XGEC) dataset of correction reasons

Prompt Insertion (PI) Method



We can omit "qualified" because ... Use "Resources" is in the plural form because ... • 3. Explanation for each pair

- "Qualified" usually means having the necessary skills, often certified by tests.
- "Human resources" refers to a workforce which indicates a group of people capable of work.
- The extracted edits are given as an instruction to the LLM one by one as additional input, causing the LLM to generate an explanation

XGEC Dataset

• The XGEC dataset includes incorrect texts, correct texts, and explanations for each edit



Experiments

The **BERTScore** between system generated explanation and human reference on the XGEC test datasets

		Precision	Recall	F1
ChatGPT	w/ IP	83.2	85.5	84.3
	w/o IP	62.1	79.6	70.0
CDT 2 5	w/ IP	81.2	83.8	82.4
GPT-3.5	w/o IP	5 61.2 79.4	79.4	69.1

PI improves the performance in all scores on both datasets

Human evaluations of GPT-3.5 and ChatGPT with and without PI on the XGEC test dataset

- The validity perspective refers to the accuracy and usefulness of grammatical information of explanations for learners
- The coverage perspective means that the LLM-generated explanation mentions all grammatical corrections

		Validity	Coverage
ChatGPT	w/ IP	1.5	2.0
	w/o IP	1.2	1.4
GPT-3.5	w/ IP	1.4	2.0
	w/o IP	1.1	1.5

- PI improves the performance in all scores on both datasets
- The PI makes it clear to LLM the corrections that need to be explained, and allows for specific explanations tied to each correction, improving the quality of LLM's explanations.