

大语言模型驱动的人机交互机器翻译 Prompt 指令集设计*

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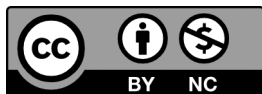
摘要 | 自2023年以来，以ChatGPT为代表的大语言模型迅速崛起，给翻译行业带来了强烈冲击，为人工智能翻译技术的改进提供了新的可能思路。基于ChatGPT的可交互性，通过设计特定的翻译Prompt指令，明确翻译任务，能有效提升译文质量，激发ChatGPT的翻译潜能，提高其在翻译领域的实用性。本文介绍了六种Prompt的设计思路，并选取样例文本进行实验，以探寻不同Prompt对于ChatGPT翻译效能的影响。

关键词 | Prompt；机器翻译；大语言模型

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一、引言

自2023年以来，以ChatGPT为代表的大语言模型迅速崛起，给人类社会生活各领域带来强烈冲击，首当其冲的是语言服务行业。翻译作为语言服务的核心内容，引入人工智能是必然的趋势。人工智能翻译技术自20世纪开始发展，机器翻译及人机协同翻译模式的运用逐渐普遍化。但传统的机器翻译依旧存在缺乏灵活性、译文生成不可控等问题。

ChatGPT作为对话式大语言模型（LLM），具有可交互性，其基于的Transformer模型，相较于部

分神经机器翻译系统背后的LSTM模型具有更加强大的前后记忆性，也更加注重逻辑性。此外，其所学习的数据参数十分庞大，涵盖内容广泛。

Prompt是指用户操作大语言模型完成某项知识处理任务时所使用的一系列指令集，对于ChatGPT而言，Prompt主要包括系统信息（如在“role”：“system”参数中给予角色）和用户信息（如具体的任务要求）。基于ChatGPT的可交互性，译者可通过撰写并输入Prompt（提示）对ChatGPT进行引导，明晰翻译需求，提出修改建议，实时反馈修改

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翻译结果,生成更加契合任务需求的结果。

目前,ChatGPT在语言服务行业的强势介入,为人工智能翻译技术的改进提供了新的可能的思路。因此,理论层面上,深入研究ChatGPT在翻译领域的潜能可为人机协同翻译创新提供新思路。实践层面上,通过设计特定场景的翻译Prompt指令,充分利用ChatGPT的可交互性,提高其实用性,促进翻译效率和质量的提升,为人机协同翻译开辟新模式。

二、国内外研究综述

目前,关于ChatGPT翻译的研究主要集中为两类,一类是对于ChatGPT翻译特点的探索,另一类是有关ChatGPT翻译Prompt的优化路径研究。

(一) ChatGPT 翻译特点的探索

Robinson et al. (2023) 运用FLORES-200语言集进行了翻译测试,发现ChatGPT在翻译高资源语言的表现时要更好。Jiao et al. (2023) 发现,如果翻译的目标语言和源语言的语系不同,翻译的表现会比翻译相同语系语言的表现差。Guerreiro et al. (2023) 发现,运用LLM翻译时可能会产生幻觉,表现为翻译质量极低或翻译内容脱离原文。通过后续的研究,发现在翻译高资源语言,幻觉出现较少。Huang et al. (2023) 认为幻觉可能来源于数据瑕疵或利用率低、模型预训练存在问题、模型解码存在缺陷等原因。Zhu et al. (2023) 发现,ChatGPT翻译存在三大典型问题:翻译目标语言混淆、幻觉、单调的翻译。

(二) ChatGPT 翻译 Prompt 的优化路径研究

Jiao et al. (2023) 通过引导ChatGPT自行产生翻译的Prompt并进行测试,得出目标语言的Prompt翻译表现最优。在后续研究中,Jiao et al. (2023) 提出一种Prompt撰写方法——Pivot Prompting,该方法有助于缓解漏译问题。Peng et al.、Lyu et al.和Marasu Yamada (2023) 均发现在Prompt中加入对翻译任务的详细描述和对翻译内容所属领域的介绍,如翻译意图、医疗文件、读者信息等,都可以显著提升ChatGPT的翻译表现。Gao et al. (2023) 发现,在待译文本中加入词性标注,并进行提示或加入五个例子进行上下文学习,可以提升ChatGPT的翻译

表现。

三、Prompt 指令设计

(一) Temperature 参数

Temperature参数是GPT模型的参数之一,用于调整随机性的数字。参数较高时,模型输出结果会有更多样的语言学变化;参数越低,则会输出语法正确和确定性较强的文本。在Peng et al. (2023) 的研究中,作者得出Temperature值在0-1之间与翻译结果的COMET值(评估翻译质量,得分越高翻译效果越好)呈负相关,且Temperature为0时,翻译质量最高。

鉴于Temperature控制随机性的特征,其可以在一定程度上用于控制译文的特征。在需要确保译文的严谨、准确性时,可以将Temperature的数值定在0,以确保译文的严谨性。但受限于ChatGPT背后数据的庞杂与可能存在的偏见,随机性的降低也可能导致翻译输出更加偏向于因模型数据原因而导致的可能存在的错误。而在需要提高译文的特殊性,如翻译童话故事、诗歌、广告词等更需要意译的翻译场景下,可以适当提高模型的Temperature值,使得译文更加多变,具有特色。

(二) 设定角色、身份信息

与传统机器翻译系统相比,ChatGPT可以通过输入提示、纳入更多信息如角色、身份信息。例如,“You are a professional translator that translates …… (specific domain)”等引导ChatGPT明确任务信息,优化任务目标,改进翻译语段,激发其翻译潜能。

对于大语言模型而言,身份是一个重要的属性,在调用ChatGPT的API使用时会专门有身份选项供用户进行定制。在翻译时指定GPT的身份信息可以使得翻译的输出结果相对更加符合原文的特征与翻译的需求,更好地理解在Prompt中提出的任务与要求。

(三) 描述翻译原文

在设定角色、身份信息,明确任务目标之后,为进一步提升其翻译质量,译者可向ChatGPT提供文本来源、类型、主要内容、语言风格等信息描述翻译原文,帮助其了解文本类型与特点,使其根据翻译的特殊需求做出更准确的翻译。

在提供原文的内容描述与翻译要求后,

ChatGPT可以根据用户提供的信息更好地翻译，如在翻译时要求对法律文本翻译得更加准确、忠于原文或者将童话故事翻译得更加有想象力，以及根据文段的内容选用更加准确的用词。但是对于原文的描述与翻译要求存在一定的主观性，如果对于原文的描述存在一定的偏差，也可能导致翻译结果变差。

（四）上下文学习（In Context Learning）

即模型根据Prompt中提供的输入-输出示例样本进行学习，并学会如何更好地模仿示例执行下游任务，使得大语言模型无需改变参数即可应对多种任务，也使其能调整策略，预测并生成更符合用户撰写的Prompt的输出。与此同时，在面对未曾学习过的任务时，模型也可以通过学习样本来获得一定的解决该任务的能力。

虽然已有研究证明ChatGPT具备一定的翻译能力，但ChatGPT作为对话模型，其更强调交互性与对话性的任务，对于翻译这类综合性任务缺少一定的学习。提供示例供ChatGPT学习，可以使翻译结果更忠于参考译文的翻译方式，使得翻译结果更加可控，提升翻译质量。然而，选择不同的语段进行上下文学习可能会对翻译效果的提升产生影响，并且ChatGPT对这一任务的学习能力也存在未知性。

（五）思维链（Chain of Thought）

简称CoT，是一种特殊的上下文学习办法，即在Prompt中要求或给予推理过程。一般而言，思维链可分为存在推理案例（如One-shot、Few-shot）和无推理案例（不给予模型例子，只告知其进行一步步的思考，即“Think step by step”）。由于思维链强调推理过程，能激活大语言模型的推理能力和逻辑能力，目前更多的被用于处理数学题目等更强调推理的问题。

对于翻译任务，要求模型进行逐步翻译有助于更好地把握语块与语块之间的关系及语段内部的逻辑关系。然而，翻译任务与数学问题、推理问题等存在本质上的差异，对逻辑与推理的需求相对较少，思维链的提升可能较为有限。

（六）引导 ChatGPT 对翻译结果进行自我纠错

在先前的研究中，Siu（2023）与耿芳、胡健（2023）发现ChatGPT可通过Prompt引导对自己的译文进行解释、修改、纠错、润色等。Koemi et

al.（2023）研究发现，ChatGPT具备评估译文的能力，可以对翻译质量进行评估，且在一定程度上替代人工评估。基于这些研究，可以设计Prompt使ChatGPT对自己产生的译文进行重新评估与修改，提升翻译质量。

此步骤可使ChatGPT对自己的译文进行进一步的改正，纠正翻译中的错误，提高翻译质量。然而，对于语段较短或错误较少的语段，要求ChatGPT进行纠错可能会使其做出不必要的修改。

四、Prompt 示例

文本样例：【持续推进备案审查信息化建设。建设好、使用好全国统一的备案审查信息平台，完善在线提出审查建议、电子备案、在线审查等平台功能，拓展信息平台的数据收集和立法服务功能，逐步实现备案审查工作数字化、智能化。】

参考译文：Continuously advancing the informatization construction of recordation review. A unified national recordation review information platform shall be effectively built and used, platform functions such as online offering of review recommendations, electronic recordation, and online review shall be improved, and the data collection and legislative service functions of the information platform shall be expanded to gradually realize the digitization and intelligence of the recordation review work.

（一）Zero-shot

Prompt: Please translate the following text into English: 【文本样例】

Translation: Continue to promote the informatization construction of the filing and review process. Build and utilize well the national unified platform for filing and review information improve platform functions such as online submission of review suggestions electronic filing and online review expand the data collection and legislative service functions of the information platform and gradually realize the digitization and intelligitization of the filing and review work.

（二）设定角色身份信息

Prompt: You are a professional translator, please translate the following text into English: 【文本样例】

Translation: Continue to promote the informatization

construction of the filing and review process. Build and make good use of the national unified filing and review information platform improve platform functions such as online submission of review suggestions electronic filing and online review expand the data collection and legislative service functions of the information platform and gradually realize the digitization and intelligentization of the filing and review work.

（三）描述翻译原文

1. 阐述文本类型与主要内容

Prompt: You are a professional translator

Context information: It is extracted from an law text telling about Decision of the Standing Committee of the National People's Congress to Improve and Strengthen the Recordation Review System. Considering the context information, please translate the following text into English: 【文本样例】

Translation: Continuously promote the informatization construction of the recordation review system. Construct and utilize the national unified recordation review information platform effectively improve platform functions such as online submission of review suggestions electronic recordation and online review expand the data collection and legislative service functions of the information platform and gradually realize the digitization and intelligentization of the recordation review work.

2. 描述文本翻译风格与要求

Prompt: You are a professional translator

Context information: It is extracted from an law text telling about Decision of the Standing Committee of the National People's Congress to Improve and Strengthen the Recordation Review System. Considering the context information, please translate the following text into English in a faithful and rigorous style: 【文本样例】

Translation: Continuously advance the informatization construction of the recordation review system. Construct and utilize well the national unified recordation review information platform improve platform functions such as online submission of review suggestions electronic recordation and online review expand the data collection and legislative service functions of the information platform

and gradually realize the digitization and intelligentization of the recordation review work.

3. 阐述文本类型与内容且描述翻译风格与要求

Prompt: You are a professional translator

Context information: It is extracted from an law text telling about Decision of the Standing Committee of the National People's Congress to Improve and Strengthen the Recordation Review System. The lexical features of it are the use of vague words, legal terms and loan words. The syntactic features are the use of long and complicated sentences, passive voice sentences and conditional clauses. Considering the context information, please translate the following text into English: 【文本样例】

Translation: Continue to promote the informatization construction of the recordation review system. Construct and utilize the national unified recordation review information platform effectively enhance the platform functions such as online submission of review suggestions electronic recordation and online review expand the data collection and legislative service functions of the information platform and gradually realize the digitization and intelligentization of the recordation review work.

（四）上下文学习

Prompt: Translate “第四条 本办法所称分类监管是指监管机构根据汽车金融公司监管评级结果，参考汽车金融公司季度风险分级和公司治理监管评估情况，对不同评级级别的汽车金融公司在市场准入、监管措施以及监管资源配置等方面实施有所区别的监管政策。” into “Article 4 For the purposes of these Measures, ‘classified regulation’ means that a regulatory authority implements differentiated regulatory policies for auto finance companies with different ratings in terms of market access, regulatory measures, allocation of regulatory resources, and other respects, based on the regulatory rating results of auto finance companies, and by taking into account auto finance companies’ quarterly risk classification and regulatory assessment of corporate governance.” Considering the few-shot example, please translate the following text into English: 【文本样例】

Translation: Continue to promote the informatization

construction of the filing and review process. Properly build and utilize the national unified filing and review information platform enhance the platform functions such as online submission of review suggestions electronic filing and online review expand the data collection and legislative service functions of the information platform and gradually realize the digitization and intelligentization of the filing and review work.

(五) 思维链

Prompt: Please translate the following sentence into English step by step and then translate the complete sentence: 【文本样例】

Translation: Let's break down the sentence into smaller parts for a step-by-step translation, and then I'll provide the complete translation at the end.

1. 十八 – Eighteen
 2. 持续推进 – continue to promote
 3. 备案审查 – record-filing review
 4. 信息化建设 – informatization construction
 5. 建设好、使用好 – build well and use well
 6. 全国统一的 – nationwide unified
 7. 备案审查信息平台 – record-filing review information platform
 8. 完善 – improve
 9. 在线提出审查建议 – propose review suggestions online
 10. 电子备案 – electronic record-filing
 11. 在线审查 – online review
 12. 等平台功能 – and other platform functions
 13. 拓展 – expand
 14. 信息平台的数据收集 – data collection of the information platform
 15. 和立法服务功能 – and legislative service functions
 16. 逐步实现 – gradually realize
 17. 备案审查工作 – the work of record-filing review
 18. 数字化、智能化 – digitalization and intelligence
- Now, putting it all together for the complete sentence:
Continue to promote the informatization construction

of the record-filing review. Build and use well the nationwide unified record-filing review information platform, improve the platform functions such as proposing review suggestions online, electronic record-filing, and online review, expand the data collection and legislative service functions of the information platform, and gradually realize the digitalization and intelligence of the record-filing review work.

(六) 引导 ChatGPT 对翻译结果进行自我纠错

Prompt: Please translate the following text into English. After translating, please check and proofread the translation to ensure that no errors have been made: 【文本样例】

Translation: Continuously advancing the informatization construction of the filing and review process. Build and effectively utilize the national unified platform for filing and review information, improve platform functions such as online submission of review suggestions, electronic filing, and online review, expand the data collection and legislative service functions of the information platform, and gradually realize the digitization and intelligentization of the filing and review work.

从句法层面看，参考译文多用“shall be”句型强调了原文中“统一的备案审查信息平台”等名词，而以上ChatGPT所翻译的语段均采用动宾结构，并无明显的强调意味，说明机器翻译过程中，并没有进行原文重点的突出及轻重的划分。从语义层面上看，参考译文将原文的“逐步实现”译成“to gradually realize”的因果关系，但以上语段均翻译为“and gradually realize”这一并列关系，表明机器翻译过程中没有深入地理解原文的内在逻辑关系。从词汇层面上说，参考译文将原文的“在线提出审查建议”译为online offering of review recommendations”，而示例则将其译成“online submission of review suggestions”，表明机器翻译时并未完全理解这一法律术语导致用词并不准确。而对于“备案”一词，参考译文译成“recording”，但示例1、2、4、5、6均翻成filing，只有示例3的三种译文翻译成recording。表明当采用prompt描述文本内容和类型时，ChatGPT能将专业词汇翻译得更为准确，且示例3的译文在

首句句式上与原文更为接近,译文流畅性更好。而示例4上下文学习相对于示例1(对照组)并没有明显的变化;示例5思维链技术引导下的ChatGPT翻译可以使得模型对于原语句更好地处理,使其将句子切分为词组并先逐步翻译,可以更好地理解句子内部的主谓宾等结构。但从将“建设好、使用好全国统一的……”翻译为“Build and use well the nationwide unified……”这一部分可以体现出思维链技术的缺点,即可能忽略词组与词组之间的关系,从而导致句内搭配不够通顺。示例6在要求ChatGPT对翻译结果进行纠错后,译文做到了无明显语法错误或用词错误,翻译结果也与参考译文更加近似,但仍存在较小的不恰当点,如将“备案审查”翻译为“filling and review”略显冗长。

由以上不同Prompt思路下的翻译实践可以得知,通过对翻译原文进行描述和对翻译结果进行自我纠错的引导后,可以使译文表现在词汇、句式上有所提升,更贴近参考译文;而思维链、上下文学习、设定身份的引导效果则相对有限。因此,采用恰当的Prompt思路引导ChatGPT,能有效激发其翻译潜能,提高其实用性。

参考文献

- [1] Gao Y, Wang R, Hou F. How to Design Translation Prompts for ChatGPT: An Empirical Study [J]. arXiv e-prints, 2023.
- [2] Guerreiro N M, Alves D, Waldendorf J, et al. Hallucinations in large multilingual translation models [J]. arXiv preprint, arXiv:2303.16104, 2023.
- [3] Huang L, Yu W, Ma W, et al. A survey on hallucination in large language models: Principles, taxonomy, challenges, and open questions [J]. arXiv preprint, arXiv:2311.05232, 2023.
- [4] Jiao W, Wang W, Huang J T, et al. Is ChatGPT a good translator? Yes with GPT-4 as the engine [J]. arXiv preprint, arXiv:2301.08745, 2023.
- [5] Jiao W, Wang W, Huang J, et al. Is ChatGPT a good translator? A preliminary study [J]. arXiv preprint, arXiv:2301.08745, 2023.
- [6] Kocmi T, Federmann C. Large language models are state-of-the-art evaluators of translation quality [J]. arXiv preprint, arXiv:2302.14520, 2023.
- [7] Lyu Q, Tan J, Zapadka M E, et al. Translating radiology reports into plain language using chatgpt and gpt-4 with prompt learning: Promising results, limitations, and potential [J]. arXiv preprint, arXiv:2303.09038, 2023.
- [8] Peng K, Ding L, Zhong Q, et al. Towards making the most of chatgpt for machine translation [J]. arXiv preprint, arXiv:2303.13780, 2023.
- [9] Robinson N R, Ogayo P, Mortensen D R, et al. ChatGPT MT: Competitive for High- (but not Low-) Resource Languages [J]. arXiv preprint, arXiv:2309.07423, 2023.
- [10] Siu S C. ChatGPT and GPT-4 for Professional Translators: Exploring the Potential of Large Language Models in Translation [J]. Available at SSRN 4448091, 2023.
- [11] Yamada M. Optimizing Machine Translation through Prompt Engineering: An Investigation into ChatGPT's Customizability [J]. arXiv preprint, arXiv:2308.01391, 2023.
- [12] Zhu W, Liu H, Dong Q, et al. Multilingual machine translation with large language models: Empirical results and analysis [J]. arXiv preprint, arXiv:2304.04675, 2023.
- [13] 耿芳, 胡健. 人工智能辅助译后编辑新方向——基于ChatGPT的翻译实例研究 [J]. 中国外语, 2023, 20(3): 41-47.

The Design of Translation Prompts for Human-Computer Interaction Machine Translation Driven by Large Language Models

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Abstract: The rapid surge of the large language models represented by ChatGPT has stricken the translation industry since 2023, providing new possibilities for the improvement of artificial intelligence translation technology. Designing the specific Prompts and clarifying the translation task based on the intractability of ChatGPT can effectively improve the translation quality and ChatGPT's practicability by stimulating the its potential. The study introduces six design thinking of Prompts and selects sample texts for experiments to explore the effects of different Prompts on the translation effectiveness of ChatGPT.

Key words: Prompt; Machine translation; Large language models