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Design of a Smart Teaching English Translation System Based on Big Data Machine Learning

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ABSTRACT

In the context of artificial intelligence, the use of machine translation in English reading classroom teaching is a more common learning method. In traditional teaching methods, machine translation is more convenient and faster than human translation, but it often deviates from the original text in terms of grammar and sentence pattern. Based on the perspective of English reading class, this paper compares traditional and machine translation, and discusses the future development trend and influence mechanism of the current situation of using machine translation in English reading class under the effect of artificial intelligence.

KEYWORDS

Artificial Intelligence, English Translation, Intelligent Robot, Machine Learning, Smart Teaching

INTRODUCTION

With the enhancement of China's comprehensive national strength and international competitiveness and the deepening of trade and cultural exchanges with countries around the world, English, as the most widely used language, has become a bridge between China and other countries. Therefore, it is important to learn English well (Wairagkar et al., 2021). In the actual process of teaching English, reading is the most important means for people to obtain information today (Church et al., 2021) The acquisition of new knowledge, the improvement of thinking ability, and the enhancement of social adaptability are closely related to reading (Gröls, 2022). In the teaching of English reading, students will inevitably encounter unfamiliar words and sentence patterns in the learning process, and the function of translation is essential here (Nguyen et al., 2022). It is not difficult to find that machine translation is quietly changing the way people learn (Arumugam & Kumar, 2021). From international conferences to daily life, Chinese-English language conversion is essential (Kang, 2021). With the rise of Artificial Intelligence, there is

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a gradual shift towards machine translation in the English classroom (Bondaryk et al., 2021). Some scholars have indicated that "simultaneous interpretation profession will be replaced by machine translation" (Dämmer, 2022, p.20). In the actual English teaching classroom, the use of machine translation and the use of computers to convert Chinese into English are the main ways students choose to learn English (Kailasam, 2022).

At first, deep learning technology was applied in the field of image processing, which can extract the most relevant features of the target from many images without manual settings. Later, it was applied to the field of machine translation to produce machine translation based on neural networks, which processes complex information by simulating the "hierarchical learning" of the human brain. Compared with traditional statistics-based machine translation methods, the quality of neural machine translation (NMT) has been significantly improved, and it has become the core technology of commercial machine translation systems. In addition, thanks to the rapid development of computer technology and artificial intelligence technology, neural machine translation methods are also making continuous progress and self-innovation to generate higher-level translations. This progress has included the initial methods based on a recurrent neural network (RNN) to transformer-based methods to the current popular cross-language-based pre-training model methods, such as mBART, T5, and mBERT models (Eludiora et al, 2021). Although the quality of the models is constantly improving, the structure, parameter, quantity, and data size of the model are correspondingly becoming larger and more complex, and the machine translation method has also changed from the original experience-based knowledge-driven approach to the data-driven approach (Wen, 2020). Therefore, large-scale and high-quality bilingual parallel corpora are the basis for improving the performance of the model (Chen, 2022).

Machine translation uses "direct translation," "syntax conversion," "semantic conversion," and other technical means to make the target language approach the source language as much as possible and try to maintain its fluency and accuracy (Song, 2021). At present, machine translation can be divided into the following three categories: rule-based machine translation, statistics-based machine translation, and neural network-based machine translation (Liu, 2021). In the early 1990s, due to the success of deep learning and neural networks in the field of artificial intelligence, machine translation introduced these new technologies, so statistical machine translation developed into neural machine translation (Xia, 2020). The main characteristics of the artificial neural network are the distributed storage of information and the parallelization of information processing (Izaz, 2022). It adopts the connectionism method and has the abilities of self-organization and self-learning, which enable people to use machines to process information in new ways and solves some problems that are difficult to solve with the traditional symbolism method (Samadi & Jond, 2021). Currently, most of the translation tasks are low resource tasks (Zhang, 2020). Due to the lack of a corpus to provide sufficient knowledge for the model, no matter what structure and training method the model adopts, it is difficult to significantly improve the quality of the translation (Doltsinis et al., 2020).

This paper starts from the need to improve the quality of low resource language machine translation. First, it summarizes some problems of low resource tasks at this stage, and expounds some mainstream low resource neural machine translation methods, such as transfer learning methods and pre-training methods (Yuan, 2020). Taking advantage of the rich language materials of high resource languages, the problem of low translation quality of low resource languages can be solved by means of two transfer learning and word list integration. Secondly, from the perspective of decreasing generalization ability during model domain migration (Kun et al., 2021), the model was fine-tuned twice to improve the generalization ability of low resource language translation models. This paper aims to provide some reference and help for the follow-up exploration and research in the field of machine translation.

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