The Current Situation of Computer-aided Translation and its Application

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Abstract. Based on 631 articles about "computer-aided translation" collected in CNKI from 1988 to 2019, this paper makes statistical analysis on teaching by drawing keyword co-occurrence network with relevant software. Translation technology, translation software and their applications are summarized. On this basis, some suggestions are put forward for the future research of cat.

Keywords: Current Situation, Computer-aided Translation, Translation Application, CNKI

1. Introduction
The study of computer-aided translation (CAT) started earlier in foreign countries. In 1946, Weaver, an American scientist, published a memorandum. He first proposed the idea of using computers to translate. Then a large number of machine translation research institutions emerged with the support of some western countries, and the academic research on machine translation flourished. However, in 1966, the American language automatic processing Advisory Committee published a report, which suggested that the funding for the research of automatic machine translation should be stopped, and that the development of machine-aided tools for translators should be suggested instead, so that cat would become another branch of research [1]. In 1980, Kay proposed the concept of "translator workstation / set" and "translator scribe". At the same time, mellby put forward the idea of designing a multilevel two-way interactive computer-aided translation system. Since the 1980s, with the emergence of corpus and other new methods, as well as the increasing requirements of translation market for translation efficiency, cat has entered a new era by learning from machine translation methods to strengthen the management of translation memory and term base [2].

At the beginning of the 20th century, translation corpus was first developed and constructed by universities in China. As early as 1957, machine translation has been listed in the national scientific development program. However, it was not until the last decade of the 20th century that computer and Internet came into the vision of the Chinese public and China continued to deepen the wave of globalization [3]. With the increasing demand for localized translation, computer-aided translation began to develop.
2. Basic Research on Computer-aided Translation

Computer-aided translation is a set of human-computer cooperation system. As a tool to assist translators, computers can help translators improve translation efficiency, ensure translation quality and optimize translation process when dealing with translation work with high repetition rate. Translation memory is the core of computer-aided translation. Translation memory is zero at the beginning. With continuous learning and storage, it becomes more and more "smart" and efficient. In addition, translation memory can also be shared, and the combination of language technology and system plays an important role in the translation project management of engineering translation [4].

The simple translation process is shown in Figure 1: the user makes use of the existing, original and translation, and aligns the two languages in sentences to build a translation memory. In the process of translation, the system will automatically retrieve the translation resources of the translation memory. If there is a translation completely matched with the original in the memory, the translation will be output directly. If there is no translation completely matched with the original in the memory, the translation will be output directly. The translation will automatically match the translation with a higher degree of similarity to give a reference translation, which can be used directly or modified by the translator.

![Diagram of Computer Aided Translation](image)

**Figure 1. Flow Chart of Computer Aided Translation**

3. Statistics of Related Documents in Computer-aided Translation

The key words are set as "computer-aided translation", "machine-aided translation", "machine-aided translation", "auxiliary translation" and "computer-aided translation", respectively. 631 articles in 1988-2019 are retrieved by precise matching in CNKI, and further statistical analysis results are made with reference to CNKI's quantitative visualization analysis and other tools. The author finds that cat is mainly supported by the National Social Science Foundation, the National Natural Science Foundation and the national education science plan, and the number of articles has been growing rapidly since 2012. The total amount of research in 2012-2019 accounts for 58.6% of the total. From the perspective of research level, basic research accounts for 52.2%, mainly focusing on the three university disciplines of Chinese language, foreign language, computer software and its application. From the distribution of the authors, Wang Huashu of Beijing Normal University, Xu Bin of Shandong Normal University, Yu Jingsong of Beijing University and Yu Jun of Xiamen Institute of technology are all active, with the output of more than five articles.

| Table 1. Statistical Table of Literature Quantity of Research Subject Keywords |
|---------------------------------------------------------------|
| Research Subject | Keywords          | N   | Sum | %   |
| Teaching         | CAT Teaching     | 18  | 90  | 28.40% |
We can find that "machine translation" and "translation teaching" are the central nodes of cat research. Among them, "translation teaching" and "master of translation" and "Curriculum" special research "machine translation" extend "translation memory" and "corpus" two important nodes with high correlation, which are the core of CAT technology. The two central nodes also have "translation soft" In addition, these cross nodes are extended to peripheral nodes in specific application fields such as localization, translation ability and term library. According to the three themes of teaching, translation technology, translation software and their applications, the author removes the three keywords of cat, which cannot be classified. The frequency of occurrence in the article is 10 times The above key words are summarized and analyzed (Table 1), and the three aspects are evaluated respectively. On this basis, some suggestions on the future research direction of cat are put forward.

4. The Prospect of Computer-aided Translation
CAT originated from machine translation and is closely related to machine translation. Therefore, the research of CAT technology focuses on the theoretical research of cat and machine translation. The future direction of translation technology research should be to integrate multiple research methods, complement each others advantages and build hybrid models. Human translators can use machine translation as an auxiliary means to greatly improve the efficiency and quality of translation. However, from the current technical point of view, machine translation can only be a kind of auxiliary means, rather than a complete replacement of human translation, and machine translation technology needs to be further improved.

It should be pointed out that the emergence and use of CAT tools are due to the continuous improvement of translation efficiency and translation quality demand in the translation market. The translators in the translation industry have great enthusiasm for CAT tools and have a lot of practical experience and insights. Therefore, from the source of the article, the research on CAT tools and applications is no longer limited to colleges and universities. There are a large number of articles from some localization companies and professional translators who have a deep understanding of the development of the software industry and provide a broader perspective for the promotion and use of CAT tools and their development trend.

5. Suggestions on the Development of Computer-aided Translation
The research of CAT technology and tools has experienced more and more mature research methods based on rules, corpus and statistics, but it is not deep enough in some problems. First, the relevant achievements of the research on Chinese grammar and semantic composition are more complicated
than that of English. Researchers need to consider the particularity of Chinese to make further attempts. Second, with the development of China's socialist market economy, the communication between the mainland and other countries is increasingly frequent, and the service demand of minority languages is growing rapidly.

One is the study of cat textbooks. Cat teaching materials play a central role in the essential elements of cat courses. Teachers' mastery of teaching content and their own ability, students' mastery of knowledge and skills, and innovation of teaching methods all come from the compilation of teaching materials. But the research of cat textbook is very weak. Therefore, it is of great practical and long-term significance to strengthen the research of cat textbooks.

The second is the training of cat teachers. There is a serious shortage of cat teachers who not only master computer related technology, but also have the basic knowledge and skills of translation. It is urgent to speed up the cultivation of composite cat teachers, change the situation that translation teachers do not understand technology and computer teachers do not understand translation.

Third, the exploration of school enterprise cooperation and joint training. For example, Xi'an Translation College and Sidi Software Technology Co., Ltd. jointly built Trados translation laboratory. In order to realize the common demands of both sides in the training of modern professional translators, schools and enterprises should carry out in-depth cooperation, expand the mechanism of order based training, cooperative curriculum development, and joint construction of teaching teams to shorten the distance between teaching and employment.

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