科技部人文社會科學研究中心
跨領域整合型研究計畫之前置規劃案成果報告

AI 論文撰寫多功能系統 「論文撰寫學習系統」、「論文撰寫輔助系統」及「論文撰寫檢測系統」:以德文及中文語言學期刊論文為例

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目錄

中文摘要

根據 Yang/Allison (2003)學術論文掌握新知識，因此亟需分析學術論文。張俊盛的寫作系統 tango, write ahead 及 Hsu, Chen, Yang,& Liu(2017)主要提供外語表達，但是書寫論文只有外語表達是不夠的，還需要論文的深層知識。目前對於學術論文書寫的著述大都停留在資深教授的經驗談或者論文應具備哪些書寫重點，尚未有被認可的論文研究模式可遵循。本計畫所研發之系統藉由學生改寫論文範本來學習寫論文，以便日後研發達到自動產生學術論文之系統。為了達到此目的，本計畫首先開發知識庫:(1)論文各章節的書寫重點及連接其關鍵句型，藉由深層學習讓系統能辨識哪些書寫重點必須有哪些關鍵句型，且也能由「關鍵句型」偵測學生撰寫哪些重點。再者(2)分析「隱藏式表達」的功能，建置「語言行為知識庫」(3)為了解決書寫論文時的詞窮情況，建置「論文的中性表達知識庫」，提供無論任何主題均可書寫的句子，例如「本論文所提問題值得深入探討」(子計畫 1)。子計畫 2 開發論文文脈連結元素知識庫及論文文脈圖譜，以便系統能解讀文章的文脈結構與發展。子計畫 3 開發論文秘書系統，例如「及時提供論文關鍵句型系統」。本計畫藉由論文結構圖譜，論文文脈圖譜，「預測論文的次序及下個語句」，量子空間模型等，構成多層關係的過濾網絡，以便定位論文的次序的功能，同時也可定位論文上下文應該出現哪些語句。總計畫融合各子計畫的知識庫及系統，研發「論文撰寫模式(產生)系統」，「論文修正系統」及「論文完整性的檢測系統」，以便學生論文可自動被修正及檢測內容是否完整。藉由學生不斷改寫論文及校正系統的判斷，以便持續更新系統，達到永續經營。
此計畫近期目標開發論文撰寫學習系統，最終目標是自動產生論文系統，藉由此系統的人機共學模式收集資料，開發論文的深層知識庫，不但達到人文及 AI 的深度跨領域融合研究，也能解決掌握學術論文精要的重大科學議題的突破。

關鍵詞:學術論文撰寫，RST, 交談分析，AI 技術，論文撰寫模式，論文修正系統，論文完整性的檢測系統

英文摘要

According to Yang & Allison (2003), journal papers produce new knowledge, thus making it important to study them. The writing systems, such as Tango, Write Ahead mainly provide foreign language sentences as assistance to writing. Academic writing is very complicated, and there is no recognized research model for analyzing the essence of academic writing or for developing an academic writing system. This project aims to propose a new system to assist students' academic writing. Students can input any journal papers related to their research topics and revise them to become their own journal papers. Using the human-computer co-learning model, the system of this project can learn from the authors of the journal papers how to rewrite them. Having learned from many authors, it can guide students in how journal papers are written and in this way a system for automatic academic writing can be created in the future. In order to achieve this goal, different knowledge bases need to be developed, namely: (1) the knowledge base for the organization of the journal papers; (2) the knowledge base for the "functions of speech acts"; and (3) the database of the "neutral expressions," which can be written regardless of the subject, in order to solve the problem of exhausted limited words in academic writing. Sub-project 2 constitutes a "context map of discourse structure" to enable the system to interpret the structured discourse of the paper. Sub-project 3 develops an assistant system for academic writing and provides the key sentences in the right place to solve the problem of limited words.

This project uses a map of the structure with the main purposes of journal papers, a map of the discourse's development in journal papers, the technique of "predicting the order and the next sentence of the paper," a quantum space model (hidden vector space), etc. to form a multi-layered relationship filtering network for the writing order of the paper and to locate and identify the occurrence of the next sentence pattern in the context of the paper in order to predict which statements will appear next. This project will integrate the knowledge bases of all sub-projects and will develop systems for "Academic Writing Learning" , for "Academic Writing Detection" and for the evaluation of "the content completeness of the written papers" so that the students' journal papers can be revised automatically. The users of this system will rewrite their papers and correct the assessment of this system constantly, so that its content will be continually updated and its sustainable operation will be achieved. The immediate goal of this project is to develop a learning system for academic writing. The ultimate goal of this project is to develop a system to automatically generate journal papers. This system uses the human-computer co-learning model to collect data and develop a deep knowledge base for academic writing. Thus, a more in-depth collaboration between human scientists and AI professors is an optimal solution to the problems of how to master the essence of academic writing.

Keywords: Academic writing, RST, conversation analysis, AI technology, academic writing mode, revision system for academic writing, detection system for completeness in journal papers