Shilei Cao

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Education

Sun Yat-sen University
Guangdong, China

B.E. in Artificial Intelligence
Sept 2020 - Present

- **GPA:** 3.8/4.0 (Top 20%)
- **Honors/Awards:**
  1. The Meritorious Winner award in the Mathematical Contest in Modeling (May 2023)
  2. The third-class University Scholarship (Oct 2021, Oct 2022)
  3. The third prize in the Asia and Pacific Mathematical Contest in Modeling (Jan 2022)
  4. The second price in the Epropulsion Cup Sailing Invitational Race (Oct 2022)
- **Courses:** Mathematical Analysis (97), Linear Algebra (98), Complex Functions (99), Matlab Language and Applications (94), Advanced Programming and Methods (92), Principles of Artificial Intelligence (91), Principles of Operating System (91), Pattern Recognition and Computer Vision (88.5), Natural Language Processing (87)

Research Experience

An Adaptive Training Tool for Critical Paper Reading
Guangdong, China

Human-computer Interaction Laboratory, Sun Yat-sen University
Sept 2022 - Apr 2023
Research Assistant, Advisor: Zhenhui Peng

- **Accepted by UIST 2023 (CCF-A) as the co-first author**
- **Project description:** Develop a training tool for critical paper reading, which leverages text summarization techniques to train readers' skills in grasping the paper's main ideas and utilizes template-based generated questions to facilitate critical thoughts.
- **Main Responsibilities:**
  1. **Formative Study:** Conducted interviews with 52 participants to recognize the difficulties that researchers encounter during critical paper reading; derived the design requirements for the tool based on literature review and interviews
  2. **Summarization Model:** Deployed the BRIO model to generate reference summaries of the content; used the Bert model to evaluate the semantic similarity of sentences to prompt users of possible omissions or redundancies in the original text
  3. **Critical Question Generation:** Utilized a classification model to classify sentences; used the YAKE model for keyword extraction to fill the critical question template based on the corresponding sentence type to generate critical questions
  4. **Backend Implementation:** Implemented the backend of the tool through Flask framework to interact with the frontend
  5. **User Experiment:** Conducted a mix-method and between-subject experiments after dividing 24 participants into two groups Perform Mann-Whitney tests on the experimental data in SPSS, and concluded that the tool could better improve participants' critical paper reading skills in raising more understandable, relevant, and critical questions after the training

Publications

Conference Proceedings

1. CriTrainer: An Adaptive Training Tool for Critical Paper Reading
   Kangyu Yuan*, Hehai Lin*, **Shilei Cao***, Zhenhui Peng, Qingyu Guo, and Xiaojuan Ma (*equal contribution)
   ACM Symposium on User Interface Software and Technology (UIST), 2023

Patents

1. Yunxiao Shan, Guohao Li, Jundong Zhang, **Shilei Cao**, Xinlong Du, Zijie He, Wei Qiu. 基于椭圆鲁棒性控制的多机器人协同追捕方法及系统. 2023101368382. (2023, in Chinese Patent filing process)
2. Yunxiao Shan, Haotian Bai, Guohao Li, **Shilei Cao**, Xinlong Du, Zijie He, Wei Qiu. 一种基于泰森多边形的多机器人追逃避障的方法及系统. 2023101532796. (2023, in Chinese Patent filing process)

Skills

Programming: Python (Pandas, PyTorch, NumPy, Scikit-learn. etc.), C/C++, Matlab, SQL
AI Algorithm: Machine Learning, Natural Language Processing, Computer Vision, Statistical Analysis and Modeling