Shilei Cao

+8613413674036 | j799017232@gmail.com | shileicao.github.io

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), Data Structures and Algorithms (87)

Research Experience

An Adaptive Training Tool for Critical Paper Reading *Guangdong, China*

Human-computer Interaction Laboratory, School of Artificial Intelligence, 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 help them learn how to raise critical thoughts.
- **Main Responsibilities:**
  1. **Formative Study:** Conducted interviews with 52 participants to recognize the difficulties that novice researchers encounter during critical paper reading; derived the design requirements for the tool based on the results of the literature review and interviews
  2. **Summarization Model:** Deployed the BRIO model to generate reference summaries of the paper 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 Model**: Utilized a sentence classification model to classify sentences; used the YAKE model for keyword extraction to fill the template critical question based on the corresponding sentence type to provide reference 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
  6. **Data Analysis:** Perform reliability tests and 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
- **Project Outcome:** Implemented a plugin based on the Google Docs platform, which can be used collaboratively by multiple people and save user-submitted records and backend-related data

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

Interests

Basketball: The captain of the basketball team of the School of Artificial Intelligence, Sun Yat-sen University

Sailing: The member of the sailing school team of Sun Yat-sen University