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RESEARCH INTERESTS

Knowledge diffusion; Scholarly communication; Interdisciplinary research; Quantitative science studies; Scientometrics

EDUCATION

Ph.D. student in Information Science 2020 - Present
School of Information Management
Wuhan University, Wuhan, China

Visiting Ph.D. student 2022 - 2023
Centre for Science and Technology Studies
Leiden University, Leiden, Netherlands

Master's Degree in Information Science 2018 - 2020
School of Information Management
Wuhan University, Wuhan, China

Bachelor's Degree in Management 2014 - 2018
School of Information Management
Sun Yat-sen University, Guangzhou, China

RESEARCH EXPERIENCE

- **Cross-disciplinary knowledge flow identification**. We developed an automatic program to download and parse bibliographic records of Web of Science and Scopus. Taking Medical Informatics (MI) and related disciplines that form its knowledge foundation as a case study, we identified knowledge units (represented by n-grams) that cross the disciplinary boundary and persist in MI. We constructed the diffusion cascade for each knowledge meme. The preferential attachment pattern was observed in the diffusion process, with disciplinary differences.

- **Time-series forecasting**. To predict emerging research topics, we first applied a frequency- and morphological-based approach to extract representative topics from bibliographic data. We then extracted temporal patterns of these topics and performed pre-processing to transform them into suitable inputs for forecasting models. The future patterns were predicted by neural networks (LSTM and NNAR model). We manually evaluated the nominated emerging topics and found them consistent with scientific prizes and news.

- **Citation context analysis**. Citation count is a flawed metric in the bibliometric analysis as citations have varied motivations and are content-dependent. Also, citation networks can be contextualized based on how the literature is cited/mentioned. We downloaded full-text articles in XML format from PubMed Central and developed a pipeline for identifying section functions and extracting the citation context. Taking Alzheimer's Disease as an example, we proposed a network model to represent how knowledge entities (e.g., disease, drug, and gene) were created/discovered and used by successors based on the citation context. We plan to adopt the Subject-Action-Object (SAO) model and analyze how the sentiment and uncertainty of knowledge relation change over time.

PUBLICATIONS Peer-reviewed journal articles

[J12] **Liang, Z.**, Ba, Z.*, Mao, J., Li, G. (2023) Research complexity increases with scientists' academic age: Evidence from library and information science. *Journal of Informetrics*, 17(1), 101375.

[J11] **Liang, Z.,** Mao, J.*, Li, G. (2023) Bias against scientific novelty: A pre-publication perspective. *Journal of the Association for Information Science and Technology*, 74(1), 99-114.

[J10] Wang, S., Ma, Y.*, Mao, J.*, Bai, Y., **Liang, Z.**, & Li, G. (2023) Quantifying scientific breakthroughs by a novel disruption indicator based on knowledge entities. *Journal of the Association for Information Science and Technology*, 74(2), 150-167.

[J9] Gao, Q., Huang, X.*, Dong, K., **Liang, Z.**, & Wu, J. (2022). Semantic-enhanced topic evolution analysis: a combination of the dynamic topic model and word2vec. *Scientometrics*, 127(3), 1543-1563.

[J8] **Liang, Z.**, Mao, J.*, Lu, K., & Li, G. (2021). Finding citations for PubMed: a large-scale comparison between five freely available bibliographic data sources. *Scientometrics*, 126(12), 9519-9542.

[J7] **Liang, Z.**, Mao, J.*, Lu, K., Ba, Z., & Li, G. (2021). Combining deep neural network and bibliometric indicator for emerging research topic prediction. *Information Processing & Management*, 58(5), 102611.

[J6] Ba, Z., Mao, J., Ma, Y.*, & **Liang, Z.** (2021). Exploring the effect of city-level collaboration and knowledge networks on innovation: Evidence from energy conservation field. *Journal of Informetrics*, 15(3), 101198.

[J5] Gao, Q., **Liang, Z.**, Wang, P., Hou, J., Chen, X., Liu, M. (2021). Potential index: Revealing the future impact of research topics based on current knowledge networks. *Journal of Informetrics*, 15(3), 101165

[J4] Ba, Z. & **Liang, Z.*** (2021). A novel approach to measuring science-technology linkage: From the perspective of knowledge network coupling. *Journal of Informetrics*, 15(3), 101167. (*corresponding author)

[J3] Mao, J., **Liang, Z.***, Cao, Y., & Li, G. (2020). Quantifying cross-disciplinary knowledge flow from the perspective of content: Introducing an approach based on knowledge memes. *Journal of Informetrics*, 14(4), 101092. (*corresponding author)

[J2] **Liang, Z.**, Mao, J.*, Cao, Y., & Li, G. (2020). Knowledge diffusion pattern analysis based on knowledge meme cascade networks. *Information Studies: Theory & Application*, 43(4), 39-46. (in Chinese)

[J1] **Liang, Z.**, Ba, Z., & Xu, J.* (2019). Development path of interdisciplinary field based on citation analysis: A case study of eye-tracking. *Library and Information Service*, 63(23), 65-78. (in Chinese)

Refereed conference papers

[C2] **Liang, Z.**, Liu, F., Mao, J., & Lu, K.* (2021). A knowledge representation model for studying knowledge creation, usage, and evolution. In *iConference 2021.* (full paper, finalists for the Lee Dirks Award for Best Full Research Paper)

[C1] **Liang, Z.**, Mao, J.*, Cao, Y., & Li, G. (2019). Idea diffusion patterns: SNA on knowledge meme cascade network. In *17th International Conference on Scientometrics and Informetrics.* (poster).

AWARDS

The First Prize Scholarship (top 10%) 2019, 2021
Wuhan University

Outstanding Student (top 5%) 2019
Wuhan University

Graduation with Distinction (top 5%) 2018
Sun Yat-sen University

SKILLS

- **Programming:** Python, Java
- **Database:** MySQL, SQLServer, MongoDB
- **Others:** Apache Spark, Machine learning, Network analysis

LANGUAGE TEST	IELTS – 8.0 (Listening 8.5, Reading 9.0, Writing 7.5, Speaking 6.5)