Frank XING | 邢竹天

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Research Interests

My research focuses on applying machine learning and natural language processing to build intelligent, knowledge-driven financial forecasting and optimization systems (the design science perspective).

I also study **the role of human knowledge in information systems**: (1) how knowledge can be represented and engineered to support decision-making, and (2) what consequences would knowledge-driven algorithms and systems cause to our environment, our mind, and our society.

Professional Appointments

Assistant Professor, National University of Singapore Affiliated to School of Computing (SoC) and Asian Institute of Digital Finance (AIDF)	2021 - now
Presidential Postdoctoral Fellow, Nanyang Technological University Amongst 12 recipients selected from 894 cross-disciplinary applicants worldwide	2019 - 2021
Machine Learning Specialist, Continental AG Acted as a technical lead and mentored innovation projects in NLP and machine learning	2018 - 2019

Academic Qualifications

PhD in Computer Science and Engineering, Nanyang Technological University Thesis: Textual Knowledge Integration for Financial Asset Management	2016 - 2019
BSc in Information Systems / BA in Economics, Peking University Thesis: Weakly Supervised Image Semantic Segmentation with Conditional Random Field	2011 - 2015

Awards and Honors

Presidential Postdoctoral Fellowship Nanyang Technological University	2019
Temasek Research Scholarship Nanyang Technological University	2016
May Fourth Scholarship Peking University	2013
Wang Jin-Yun Scholarship Wuhan No.2 Middle School	2011

Research Grants

Advancing Information-intensive Financial Modeling with NLP Solutions, Role: PI Singapore Ministry of Education AcRF Tier 1, SGD 180,000	2021 - 2024
Innovative Approaches to Portfolio Optimization, Role: PI NTU Presidential Postdoctoral Fellowship Research Grant, SGD 200,000	2019 - 2021
Conti+ Service Chatbot, Role: Staff Continental Internal R&D Project, EUR 30,070	2018
Irony Detection on the Internet, Role: PI PKU President's Undergraduate Research Fellowship, CNY 2,000	2013

Publications

Books and Chapters

1. **Xing, F. Z.**; Cambria, E.; Welsch, R. E. (2019). Intelligent Asset Management. **Springer International Publishing**. In Series "Socio-Affective Computing", ISBN: 978-3-030-30262-7.

Journal Papers

7. Ma, Y.; Nguyen, K. L.; **Xing, F. Z.**; and Cambria, E. (2020). A survey on empathetic dialogue systems. **Information Fusion**. 64, pp 50-70.

6. **Xing, F. Z.**; Cambria, E.; and Zhang, Y. (2019). Sentiment-aware volatility forecasting. **Knowledge-Based Systems**. 176, pp 68-76.

5. **Xing, F. Z.**; Cambria, E.; and Welsch, R. E. (2019). Growing semantic vines for robust asset allocation. **Knowledge-Based Systems**. 165, pp 297-305.

4. **Xing, F. Z.**; Pallucchini, F.; and Cambria, E. (2019). Cognitive-inspired domain adaptation of sentiment lexicons. **Information Processing & Management**. 56(3), pp 554-564. [Honorable Mentions]

3. Malandri, L.; **Xing, F. Z.**; Orsenigo, C.; Vercellis, C.; and Cambria, E. (2018). Public mood-driven asset allocation: The importance of financial sentiment in portfolio management. **Cognitive Computation**. 10(6), pp 1167-1176.

2. **Xing, F. Z.**; Cambria, E.; and Welsch, R.E. (2018). Intelligent asset allocation via market sentiment views. **IEEE Computational Intelligence Magazine**. 13(4), pp 25-34.

1. **Xing, F. Z.**; Cambria, E.; and Welsch, R.E. (2018). Natural language based financial forecasting: A survey. **Artificial Intelligence Review**. 50(1), pp 49-73.

Conference Papers

10. Young, T.; **Xing, F.Z.**; Pandelea, V.; Ni, J.; and Cambria, E. (2022). Fusing task-oriented and open-domain dialogues in conversational agents. **AAAI**. Vancouver, Canada.

9. **Xing, F.Z.**; Hoang, D.-H.; and Vo, D.-V. (2021). High-frequency news sentiment and its application to forex market prediction. **HICSS**. Online.

8. **Xing, F.Z.**; Malandri, L.; Zhang, Y.; and Cambria, E. (2020). Financial sentiment analysis: An investigation into common mistakes and silver bullets. **COLING**. Online.

7. Cambria, E.; Li, Y.; **Xing, F. Z.**, Poria, S.; and Kwok, K. (2020). SenticNet 6: Ensemble application of symbolic and subsymbolic AI for sentiment analysis. **CIKM**. Online.

6. Bai, H.; **Xing, F. Z.**; Cambria, E.; and Huang, W.-B. (2019). Business taxonomy construction using concept-level hierarchical clustering. **FinNLP@IJCAI**. Macao, China.

5. **Xing, F. Z.**; Cambria, E.; Malandri, L.; and Vercellis, C. (2018). Discovering Bayesian market views for intelligent asset allocation. **ECML-PKDD**. Dublin, Ireland.

4. **Xing, F. Z.**; Cambria, E.; and Zou, X. (2017). Predicting evolving chaotic time series with fuzzy neural networks. **IJCNN**. Anchorage, USA.

3. **Xing, F. Z.**; Ho, D; Hamzah, D; and Cambria, E. (2017). Classifying World Englishes from a lexical perspective: A corpus-based approach. **CICLing**. Budapest, Hungary.

2. **Xing, F. Z.**; Cambria, E.; Huang, W.-B.; and Xu, Y. (2016). Weakly supervised semantic segmentation with superpixel embedding. **ICIP**. Phoenix, USA.

1. **Xing, F. Z.** and Xu, Y. (2015). A logistic regression model of irony detection in Chinese internet texts. **CICLing**. Cairo, Egypt.

Guest Editorials

2. Malandri, L.; Porcel, C.; **Xing, F. Z.**; Serrano-Guerrero, J.; and Cambria, E. (2021). Soft Computing for Recommender Systems and Sentiment Analysis. **Applied Soft Computing**. forthcoming.

1. **Xing, F. Z.**; Poria, S.; Cambria, E.; and Welsch, R. (2020). Social media marketing and financial forecasting. **Information Processing & Management**. 57(5), 102314.

Invited Talks

"Financial Sentiment Analysis: A Neurosymbolic Approach", University of Essex	2021
"Clustering in Financial Analysis", National University of Singapore Seminar	2021
"Financial Sentiment Analysis", Singapore Symposium on Sentiment Analysis	2021
"Intelligent Asset Management and NLP", CFE-CMStatistics Conference	2020
"Managing your Finances with AI", NTU Institute of Advanced Studies Webinar	2020
"Three interfaces between NLP and asset allocation", Lund University	2020
"Stock market prediction meets uncertainty and high-dimension", Westlake University	2019
"From informatization to intelligence", Peking University	2019
"Sentiment and sentiment time series", Wuhan University of Technology	2019

Teaching

Instructor, IS3107: Data Engineering National University of Singapore, Spring	2022
Co-instructor, IS6000: Topics in Information Systems and Analytics Research National University of Singapore, Fall	2021
Co-instructor, CZ4034: Introduction to Information Retrieval Nanyang Technological University, Spring (Student evaluation: 4.3/5)	2021
Teaching Assistant, CZ2002: Object Oriented Design & Programming in Java Nanyang Technological University, Spring	2016
Teaching Assistant, CZ4034: Introduction to Information Retrieval Nanyang Technological University, Spring	2016

Supervision

Qi Qi, PhD student	2021
Chung-I Lu, PhD student (co-advising with K.W. Huang)	2021
Xiuyu Chen, Research Associate Placement: PhD student @ Hong Kong University	2020
Filippo Pallucchini, Master Student Placement: Research Fellow @ University of Milano-Bicocca	2018

Academic and Departmental Services

Editorial Board, Journal Guest Editor, and Conference Area/Track Chair
IEEE Transactions on Affective Computing (TAC), forthcoming special issue (2022)
IEEE Transactions on Artificial Intelligence (TAI), forthcoming special issue (2021)
Applied Soft Computing, forthcoming special issue (2021)
Information Processing & Management, vol 57, special issue 5 (2020)

Sentiment Analysis Area Chair, International Conference on Computational Linguistics (2020)

Journal Reviewer and Conference PC Member
Information Fusion -Outstanding Contribution Award	2019
Knowledge-Based Systems -Outstanding Contribution Award	2018

European Journal of Finance (EJoF)
Expert Systems With Applications (ESWA)
Financial Innovation (FIN)
IEEE Transactions on Affective Computing (TAC)
IEEE Transactions on Engineering Management (TEM)
IEEE Computational Intelligence Magazine (CIM)
International Journal of Forecasting (IJoF)
Journal of the Association for Information Science and Technology (JASIST)
etc.

AAAI Conference on Artificial Intelligence (AAAI)	2021 - 2022
Annual Meeting of the Association for Computational Linguistics (ACL)	2021 - 2022
International Conference on Artificial Intelligence and Statistics (AISTATS)	2021
Economics and Natural Language Processing Workshop (ECONLP)	2021
Hawaii International Conference on System Sciences (HICSS)	2021 - 2022
International Joint Conference on Artificial Intelligence (IJCAI)	2021 - 2022
International Workshop on Natural Language Processing for Social Media (SocialNLP)	2021

etc.

Grant Proposal Reviewer
The Czech Science Foundation: Standard Project 22-*****S

Professional Society Membership
AIS SIG on Decision Support and Analytics (2021-2022)
INFORMS Information Systems Society (2020-2022)
IEEE Computational Intelligence Society (2016-2017)

Administrative Roles
Interviewer, Faculty Candidate Evaluation, NUS School of Computing (2021)
Interviewer, Discretionary Admission and Scholarship Selection, NUS School of Computing (2021)
Member, Publication Ranking Committee, NUS School of Computing (2021)
Final Year Project Evaluator, NUS School of Computing (2021)

Media Coverage

Using News Sentiments in the High-Frequency Forex Market (by Simon Rodda), **Dow Jones: Dec 14**	2020
Machine Learning apply to Quantitative Investment no.62, **QIML: Jul 12**	2018

Referees

Available upon request.   Last updated: Dec 2021.