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 2021 - now
Affiliated to School of Computing (SoC) and Asian Institute of Digital Finance (AIDF)

Presidential Postdoctoral Fellow, Nanyang Technological University 2019 - 2021
Amongst 12 recipients selected from 894 cross-disciplinary applicants worldwide

Machine Learning Specialist, Continental AG 2018 - 2019
Acted as a technical lead and mentored innovation projects in NLP and machine learning

Academic Qualifications

PhD in Computer Science and Engineering, Nanyang Technological University 2016 - 2019
Thesis: Textual Knowledge Integration for Financial Asset Management

BSc in Information Systems / BA in Economics, Peking University 2011 - 2015
Thesis: Weakly Supervised Image Semantic Segmentation with Conditional Random Field

Awards and Honors

Presidential Postdoctoral Fellowship 2019
Nanyang Technological University

Temasek Research Scholarship 2016
Nanyang Technological University

May Fourth Scholarship 2013
Peking University

Wang Jin-Yun Scholarship 2011
Wuhan No.2 Middle School

Research Grants

Advancing Information-intensive Financial Modeling with NLP Solutions, Role: **PI** 2021 - 2024
Singapore Ministry of Education AcRF Tier 1, SGD 180,000

Innovative Approaches to Portfolio Optimization, Role: **PI** 2019 - 2021
NTU Presidential Postdoctoral Fellowship Research Grant, SGD 200,000

Conti+ Service Chatbot, Role: Staff 2018
Continental Internal R&D Project, EUR 30,070

Irony Detection on the Internet, Role: **PI** 2013
PKU President's Undergraduate Research Fellowship, CNY 2,000

Publications

Citations

Web of Science	count: 441	h-index: 8
Scopus	count: 560	h-index: 9
Google Scholar	count: 840	h-index: 10

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

8. Chen, X. and **Xing, F. Z.** (2022). Financial Risk Tolerance Profiling from Text. **Under review, Expert Systems with Applications**.
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. (2022). Soft computing for recommender systems and sentiment analysis. **Applied Soft Computing**. 118, 108246.
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 [New module individually developed] — 2022
National University of Singapore, Spring

Co-instructor, IS6000: Topics in Information Systems and Analytics Research — 2021
National University of Singapore, Fall (Student evaluation: n.a.)

Co-instructor, CZ4034: Introduction to Information Retrieval — 2021
Nanyang Technological University, Spring (Student evaluation: 4.3/5)

Teaching Assistant, CZ2002: Object Oriented Design & Programming in Java — 2016
Nanyang Technological University, Spring

Teaching Assistant, CZ4034: Introduction to Information Retrieval — 2016
Nanyang Technological University, Spring

Supervision

PhD student:
Qi Qi (2021-)
Chung-I Lu (2021-), co-advising with K.-W. Huang
Kelvin Du (2022-), co-advising with E. Cambria

Research Assistant/Associate:
Xiuyu Chen (2020-2021), Placement: PhD student @ Hong Kong University

Master/BComp Dissertation student:
GE Siqi, CHEN Siyi, Tarcius WEE (2022-)
Filippo Pallucchini (2018-2019), Placement: Research Fellow @ University of Milano-Bicocca

IIP (Industry Internship Programme) student:
Leow Yong Sen and Wang Xingpeng (2022)

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, vol 118, special issue (2022)
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)
Information Processing & Management (IPM)
International Journal of Forecasting (IJoF)
Journal of Business Analytics (JBA)
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 (2021-2022)
Interviewer, Discretionary Admission and Scholarship Selection, NUS School of Computing (2021-2022)

Member, Publication Ranking Committee, NUS School of Computing (2021-2022)
Final Year Project Evaluator, NUS School of Computing (2021-2022)

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: Mar 2022.