Research Statement

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Background

The percentage of unstructured data is on the rise. According to *International Data Group*, 80% of the world's data will be unstructured by 2025. Data-driven culture is one of the key drivers for organizational success. To increase agility and make fast and strategical decisions, firms need to understand the increasingly important unstructured data to build the foundations for accurate data insights.

Research Areas

My education background in information systems, statistics, and accounting enables me to examine a broad range of questions that can aid C-suite executives in improving the management of information, especially during the unstructured data era. My recent research focuses on the value implications and market efficiency of unstructured information (e.g., corporate narrative disclosure, conference call transcripts, social media, online consumer reviews, audio, and video). By applying a combination of theories and methodologies from computer science, information economics, accounting, finance, marketing, sociology, and psychology, I investigate 1) how to extract and quantify value relevant features from unstructured data? 2) the determinants and consequences of such features; and 3) how can decision makers combine machine learning and econometrics to enhance decision quality, operation efficiency, firm valuation, employee productivity, and to fortify causal inference?

Utilizing deep learning and natural language processing methods, I have developed many kinds of textual measures, including but not limited to management accounting index, corporate strategy, narrative innovation, aging risk, trade-war risk, climate risk, and employee friendless, financial fraud risk, etc. For example, we have examined how firms react to trade policy effect uncertainty (TPEU), a less studied type of firm specific perceived environmental uncertainty in which managers have difficulty predicting how potential policy changes will affect their operations. To captures *the degree to which a firm lacks understanding of the specific impacts of trade policy changes on its own businesses*, we apply Bidirectional Encoder Representations from Transformers (BERT), a state-of-the-art deep learning approach, to construct a text-based and context-dependent measure of time-varying, firm-specific (idiosyncratic) measure of TPEU. The results of the econometric analyses show that firms experiencing higher TPEU tend to reduce innovation investments. Furthermore, this effect is more evident for firms within industries with lower competition, not owned by the state, and involving more foreign sales. Our findings help to explain prior mixed findings by demonstrating that policy effect uncertainty is a particularly relevant influence on firms' innovation investment decisions, and by highlighting resource dependent factors as important contingencies. Methodologically, this study provides an early demonstration of the potential of adopting deep learning methods (e.g.,

Bidirectional Encoder Representations from Transformer BERT) in operation and management fields facing the challenges of extracting measures from textual data. Our validation of the TPEU measure is useful in further research involving firm-specific policy uncertainty.

Besides above example, I aim to bridge the research gaps by constructing novel textual measures of management accounting practices (*MAP*s) from a large-scale and holistic perspective. Even though the design of MAPs is very important in terms of gaining continuous improvement and ultimately achieving organizational objectives, empirical research on *MAP*s has remained nascent due to the lack of publicly available high-quality data. Hence, I develop firm-level textual measures of *MAP*s with a content analysis approach of Word2Vec. A battery of validations are conducted to verify the measures truly reflect companies' actual choices on MAPs, including content, convergent, discriminant, persistence, reliability and mobility, and external validity. I then propose theoretically ideal models of MAPs across life cycle stages to obtain the Fit index and compute the cosine similarity between textual *MAP*s and ideal models. A high similarity indicates a high level of *Fit*. Consistent with the argument that contingent fit is a source of competitive advantage and superior performance, I find that *Fit* positively influences current performance and earnings persistence.

In addition, I have developed textual style metrics and thematic content, which better explain the fraud process from the dimensions of why, how, and the ultimate fraud manifestation. And the research results indicate that fraud risk estimated by the metrics is incremental informative about corporate operational efficiency and analyst forecasting error, and can be used to form a zero-investment portfolio to generate abnormal stock returns.

In my future research, I see myself continuing cross-disciplinary research nature by bridging the gap between the fields of accounting/finance and information system using Large Language Models (LLMs). Due to the nature of the evolvement of big data and the increasingly important roles of unstructured data in corporate decision making, corporate disclosure, investors' buy and sale, technologies will play a critical role in cross-disciplinary research. More importantly, AI is just a tool, and tool cannot replace business school graduate and generate sustainable competitive advantage unless we, as decision makers, use it correctly to make the decisions. Hence, in the future, the management aspects of AI, the bias and the fairness, and the behavioral aspects of AI (e.g., the interaction between AI and accountant) will become much more important teaching and research topics for IS scholars.

Selected Publications and Outputs

Impact of Government Outsourcing Contracts on High-Tech Vendors: An Empirical Study", Dong, Yi, Hu, Nan, Ji,Yonghua, Ni, Chenkai, Xie, Jing, **Journal of Management Information Systems**, Volume 41, Issue 2, 2024 **UTD 24, FT-50, and ABDC A***

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Swink, **Journal of Operations Management**, Volume 70, Issue 2, 2024. **ABS 4, UTD 24, FT-50, and ABDC A***

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Does CEO agreeableness personality mitigate real earnings management?", Shan Liu, Xingying Wu, Nan Hu，**International Review of Financial Analysis**, Volume 95, Part B, October 2024

The information content of financial statement fraud risk: An ensemble learning approach", Wei Duan, Nan Hu, Fujing Xue, **Decision Support Systems**, Volume 182, July 2024

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Not all those glitters is gold: The effect of attention and blogs on the investors' investing behaviors, by Nan Hu, Yi Dong, Ling Liu, and Lee J. Yao 2011, *Journal of Accounting, Auditing & Finance*, 2012, doi:10.1177/0148558X12459606 **-ABS 3 and ABDC A**

The impact of IFRS on accounting quality in a regulated market: an empirical study of China, by Chunhui Liu, Lee J. Yao, Nan Hu, and Ling Liu, 2011, *Journal of Accounting, Auditing & Finance*, October, 2011 vol. 26 no. 4 **-ABS 3 and ABDC A**

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