

# Denghui Zhang

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## EDUCATION

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**Rutgers Business School, Rutgers University, New Jersey, USA**

*Sep. 2018 - Jun. 2023*

- Ph.D. in Information Systems, Rutgers Data Mining Lab
- Advisor: Prof. Hui Xiong, Fellow of IEEE and AAAS
- Thesis Title: From General AI to Specialized AI – Domain Knowledge Inspired Deep Learning

**Institute of Computing Technology, Chinese Academy of Sciences, China**

*Sep. 2015 - Jun. 2018*

- M.S. in Computer Science, CAS Key Laboratory of Network Data Science and Technology

**University of Science and Technology Beijing, China**

*Sep. 2011 - Jun. 2015*

- B.E. in Electronic Engineering, School of Computer and Electronic Engineering

## RESEARCH INTEREST

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Artificial intelligence, data mining and natural language processing with applications in business: talent analytics, e-commerce review understanding, fintech, etc.

**ML Methodologies:** Graph Representation Learning, Text Representation Learning, Reinforcement Learning

## PUBLICATIONS

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### Peer-reviewed Conference and Journal Publications (Accepted)

- [21] TKDE **Multi-Faceted Knowledge-Driven Pre-training for Product Representation Learning**  
Denghui Zhang, Yanchi Liu, Zixuan Yuan, Yanjie Fu, Haifeng Chen, Hui Xiong  
*IEEE Transactions on Knowledge and Data Engineering*, 2022.
- [20] AAAI'23 **Human-instructed Deep Hierarchical Generative Learning for Automated Urban Planning**  
Dongjie Wang, Lingfei Wu, Denghui Zhang, Jingbo Zhou, Leilei Sun, Yanjie Fu  
*The 37th AAAI Conference on Artificial Intelligence*, 2023.
- [19] KDD'22 **Towards Learning Disentangled Representations for Time Series**  
Yuening Li, Zhengzhang Chen, Daochen Zha, Mengnan Du, Jingchao Ni, Denghui Zhang,  
Haifeng Chen, Xia Hu. *The 28th ACM SIGKDD Conference on Knowledge Discovery and Data Mining*, 2022. (14.99% acceptance rate)
- [18] CIST'22 **Acqui-hiring or Acqui-quitting: Post-M&A Turnover Prediction via a Dual-fit GNN Model**  
Denghui Zhang, Hao Zhong, Jinyuan Yang  
*INFORMS Conference On Information Systems And Technology (CIST)*, 2022. (In preparation for *Information Systems Research*)

- [17] WDS'22 **AlphaVC: A Reinforcement Learning-based Venture Capital Investment Strategy**  
Zixuan Yuan\*, Denghui Zhang\*, Hao Zhong, Shengming Zhang, Hui Xiong  
INFORMS *Workshop on Data Science* 2022. (\* denotes equal contribution. In preparation for *Management Science*.)
- [16] KDD'21 **Domain-oriented Language Modeling with Adaptive Hybrid Masking and Optimal Transport Alignment**  
Denghui Zhang, Zixuan Yuan, Yanchi Liu, Hao Liu, Fuzhen Z, Hui Xiong, Haifeng Chen  
The 27th ACM *SIGKDD Conference on Knowledge Discovery and Data Mining*, 2021. (Research track, 15.4% acceptance rate)
- [15] AAAI'22 **Learning to Walk with Dual Agents for Knowledge Graph Reasoning**  
Denghui Zhang\*, Zixuan Yuan\*, Hao Liu, Xiaodong Lin, Hui Xiong  
The 36th AAAI *Conference on Artificial Intelligence*, 2021. (Long paper, 15% Acceptance rate)
- [14] AAAI'21 **Self-Supervised Prototype Representation Learning for Event-Based Corporate Profiling**  
Zixuan Yuan, Hao Liu, Renjun Hu, Denghui Zhang, Hui Xiong.  
The 35th AAAI *Conference on Artificial Intelligence*, 2021. (Long paper, 21% acceptance rate)
- [13] TBD **RPT: Toward Transferable Model on Heterogeneous Researcher Data via Pre-Training**  
Ziyue Qiao, Yanjie Fu, Pengyang Wang, Meng Xiao, Zhiyuan Ning, Denghui Zhang, Yi Du, Yuanchun Zhou. *IEEE Transaction on Big Data*
- [12] ICDM'20 **T<sup>2</sup>-Net: A Semi-supervised Deep Model for Turbulence Forecasting**  
Denghui Zhang, Yanchi Liu, Wei Cheng, Bo Zong, Jingchao Ni, Zhengzhang Chen, Haifeng Chen, Hui Xiong  
The 20th IEEE *International Conference on Data Mining*, 2020. (19.7% acceptance rate)
- [11] SIGIR'20 **Spatio-Temporal Dual Graph Attention Network for Query-POI Matching**  
Zixuan Yuan, Hao Liu, Yanchi Liu, Denghui Zhang, Fei Yi, Nengju Zhu, Hui Xiong  
The 43rd ACM SIGIR *International Conference on Research and Development in Information Retrieval*, 2020. (Long paper, 26% acceptance rate)
- [10] CIKM'19 **Job2Vec: Job Title Benchmarking with Collective Multi-View Representation Learning**  
Denghui Zhang, Junming Liu, Hengshu Zhu, Yanchi Liu, Lichen W, Pengyang W, Hui Xiong  
The 28th ACM *International Conference on Information and Knowledge Management*, 2019. (19.7% acceptance rate)
- [9] AAAI'18 **Path-Based Attention Neural Model for Fine-Grained Entity Typing**  
Denghui Zhang, Manling Li, Pengshan Cai, Yantao Jia, Yuanzhuo Wang  
The Thirty-Second AAAI *Conference on Artificial Intelligence*, 2018. (Abstract paper)
- [8] WI'17 **Efficient Parallel Translating Embedding For Knowledge Graphs**  
Denghui Zhang, Manling Li, Yantao Jia, Yuanzhuo Wang, Xueqi Cheng  
The IEEE/WIC/ACM *International Conference on Web Intelligence*, 2017. (Long paper)
- [7] TBD **Link Prediction in Knowledge Graphs: A Hierarchy-Constrained Approach**  
Manling Li, Denghui Zhang, Yantao Jia, Yuanzhuo Wang, Xueqi Cheng  
*IEEE Transaction on Big Data Special Issue on Knowledge Graphs*, 2017.

## Working Papers

- [6] ISR      **Acqui-hiring or Acqui-quitting: Post-M&A Turnover Prediction via a Dual-fit GNN Model**  
Denghui Zhang, Hao Zhong, Jingyuan Yang  
*Information Systems Research*. (Under Review). Accepted by *CIST 2022*, *WITS 2022* and *INFORMS Workshop on Data Science 2022*.
- [5] MNSC      **AlphaVC: A Reinforcement Learning-based Venture Capital Investment Strategy**  
Zixuan Yuan\*, Denghui Zhang\*, Hao Zhong, Shengming Zhang, Hui Xiong  
*Management Science* (In preparation). Accepted by *INFORMS Workshop on Data Science 2022*.  
(\* denotes equal contribution.)
- [4] ICDE'23      **Variation-aware E-commerce Product Linkage with Mix-supervised Pre-training**  
Denghui Zhang, Zhengyang Wang, Pengyang Wang, Yanjie Fu, Zixuan Yuan, Hui Xiong  
IEEE International Conference on Data Engineering, 2023. (**Major Revision**)
- [3] TKDE      **LEVER: Online Adaptive Sequence Learning Framework for High-Frequency Trading**  
Zixuan Yuan, Junming Liu, Haoyi Zhou, Denghui Zhang, Hao Liu, Nengjun Zhu, Hui Xiong  
*IEEE Transactions on Knowledge and Data Engineering*, 2022. (**Major revision**)
- [2] IJCAI'23      **Interpretable Event-Driven Financial Forecasting with Online Knowledge Distillation**  
Zixuan Yuan, Hao Liu, Renjun Hu, Denghui Zhang, Peter Hafez, Xiaodong Lin, Hui Xiong  
The 32nd International Joint Conference on Artificial Intelligence, 2023. (Under review)
- [1] IJCAI'23      **Self-Paced Unified Representation Learning for Hierarchical Multi-Label Classification**  
Zixuan Yuan, Hao Liu, Haoyi Zhou, Denghui Zhang, Xiao Zhang, Hao Wang, Hui Xiong  
The 32nd International Joint Conference on Artificial Intelligence, 2023. (Under review)

## Patents

- US Patent      **Multi-Faceted Knowledge-Driven Pre-training for Product Representation Learning**  
17584638      Yanchi Liu, Bo Zong, Haifeng Chen, Xuchao Zhang, Denghui Zhang (first student author)
- US Patent      **Semi-supervised Deep Model for Turbulence Forecasting**  
17165515      Yanchi Liu, Jingchao Ni, Bo Zong, Haifeng Chen, Zhengzhang Chen, Wei Cheng,  
Denghui Zhang (first student author)
- US Patent      **Multi-scale Multi-granularity Spatial-temporal Traffic Volume Prediction**  
17003112      Yanchi Liu, Wei Cheng, Bo Zong, LuAn Tang, Haifeng Chen, Denghui Zhang (first student author)

## HONORS & AWARDS

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- Baidu Research PhD Fellowship Finalist (20 students around the world), 2022
- Dean's Dissertation Fellowship at Rutgers University
- AAAI-23 Student Scholar
- Student Scholarship from INFORMS Workshop on Data Science
- National Scholarship (Top 2%, the most prestigious scholarship in China)
- National Motivational Scholarship (Top 5%)
- Freshman Scholarship at Chinese Academy of Sciences (Top 10%)
- Excellent Student Awards at Chinese Academy of Sciences (Top 5%)

## PROFESSIONAL EXPERIENCES ---

### Product Graph Team, Amazon Science, Applied Scientist Intern

*May-August 2021*

- Mix-supervised pre-training for variation-aware entity linkage: Proposed a mix-supervised pre-training framework and delivered a pre-trained e-commerce domain language model, which is less label-intensive and can be easily fine-tuned to detect both duplicate (i.e., exact match) and variation entities.

### Data Science Department, NEC Laboratories America, Research Intern

*May-August 2020*

- Deep contextualized product semantic learning: Proposed to adapt language model pre-training to the scenario of product matching, product search, etc., enhancing language modeling of product domain with product knowledge.

### Data Science Department, NEC Laboratories America, Research Intern

*May-August 2019*

- Spatiotemporal traffic volume prediction: Proposed Spatial-Temporal Multi-Scale Multi-Granularity Network (ST-MSGN) for site-level traffic volume prediction, by modeling the complex spatial and temporal dependencies and their interactions. Conduct experiments on real-world datasets (NYC-Bike and NYC-Taxi) to validate the effectiveness of the model.

### Baidu Talent Intelligence Center, Research Intern

*June-August 2018*

- Resume distribution: Developed resume recommender system for Baidu HR department, using NLP techniques to obtain the resume-job similarities and distribute resumes according to similarity scores and the headcount of different departments.
- Job title benchmarking: Developed a data-driven approach to match job titles with similar expertise levels across various companies.

## TEACHING EXPERIENCES ---

### Course Lecturer at Rutgers University

- 29:623:335:01, Data Warehousing & Data Mining (31 students), Spring 2022
- Hybrid teaching (in-person and zoom).
- Teaching Effectiveness Evaluation: **4.53/5** (department average score 4.29/5).

## Teaching Assistant at Rutgers University

- 29:623:345:01, Cyber Security, Fall 2021, Spring 2022
- 29:623:335:01, Data Warehousing & Data Mining, Spring 2021
- 33:136:485:02, Time Series Model, 2020 Fall

## PROFESSIONAL SERVICES

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### Session Chairs

- The 28th ACM SIGKDD Conference (2022)  
Session Chair of “Graph Learning and Social Networks”
- INFORMS Annual Meeting (2022)  
Session Chair of “AI-driven Business Analytics: New Advances and Applications”

### Program Committee Members

- AAAI Conference on Artificial Intelligence (AAAI), 2022, 2021.
- ACM Conference on Knowledge Discovery and Data Mining (SIGKDD), 2022, 2021.
- International Joint Conference on Artificial Intelligence (IJCAI), 2022, 2021.
- Association for Computational Linguistics (ACL) Rolling Review, 2022, 2021.
- ACM International Conference on Web Search and Data Mining (WSDM), 2022, 2021.
- International Conference on Information and Knowledge Management (CIKM), 2020
- International Conference on Information Systems (ICIS), 2022
- Pacific Asia Conference on Information Systems (PACIS), 2022
- The Workshop on Information Technologies and Systems (WITS), 2022

### Journal Reviewers

- Transactions on Management Information Systems (TMIS), 2022
- Journal of Electronic Commerce Research and Applications (ECRA), 2022
- IEEE Transactions on Knowledge and Data Engineering (TKDE), 2019

## SKILLS

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Language     Python, C/C++, Java, Scala, MySql, Shell, Matlab  
Tools         PyTorch, Tensorflow, Keras, Spark MLlib, Sklearn, Pandas

## REFERENCES

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- Hui Xiong (advisor), Distinguished Professor  
Rutgers Business School, Rutgers University  
**hxiong@rutgers.edu**
- Guiling Wang, Distinguished Professor  
New Jersey Institute of Technology  
**guiling.wang@njit.edu**
- Thomas Lidbetter, Associate professor  
Rutgers Business School, Rutgers University  
**tlidbetter@business.rutgers.edu**