Yi Li

Assistant Professor

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Research Interests

Social Computing, Algorithm Design and Analysis on Social Networks, Optimization Methods and Techniques. Data Analytics, Malicious Information Detection and Propagation, Vehicular ad hoc Network (VANETs), Natural Language Processing

Teaching Interests

Data Structures, Algorithm Design and Analysis, Programming Fundamentals, Database System Design, Data Science, Web Development

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Education

The University of Texas at Dallas (UTD) *Richardson, USA* Ph.D. in Computer Science Advisor: Dr. Weili Wu	01/2015 – 08/2019
The University of Texas at Dallas (UTD) *Richardson, USA* M.S. in Computer Science	01/2014 – 01/2015
The University of Texas at Dallas (UTD) *Richardson, USA* M.A. in Digital Communication and Multimedia Concentration: Emerging Media	08/2010 – 05/2012
Chang'an University (CHD) *Xi'an, China* B.A. in Advertising	09/2006 – 07/2010

Positions

The University of Texas at Tyler (UTTyler) *Tyler, USA* Assistant Professor – Computer Science Department Supervisor: Dr. Stephen B. Rainwater	08/2019 – Present
The University of Texas at Dallas (UTD) *Richardson, USA* Teaching & Research Assistant in Department of Computer Science – Data Communication and Data Management Lab Supervisor: Dr. Ding-Zhu Du & Dr. Weili Wu	01/2016 – 08/2019

The University of Texas at Dallas (UTD) Richardson, USA

01/2015 – 08/2016

Teaching & Research Assistant in Department of Computer Science –
Human Language Technology Research Institute
Supervisor: Dr. Yang Liu

Greatwall Inc. – Universal Mortgage Frisco, USA

05/2012 – 08/2014

Web Developer in Social Media Group
Supervisor: Shan Guo

Awards

Teaching Assistantship (UTD) USA

01/2015 – 08/2019

Research Assistantship (UTD) USA

01/2015 – 08/2019

Robert Armstrong Scholarship (UTD) USA

01/2011 – 05/2012

The Outstanding Student Scholarship (CHD) China

2007, 2008, 2009

Professional Experience

The University of Texas at Tyler (UTTyler) Tyler, USA

08/2019 – Present

Assistant Professor – Computer Science Department

Research:

- Target Users Activation in Social Networks – two problems have been studied in target users' activation research area. First problem examined how to activate a specific set of targeting users with limited budget. We modeled the Activation Probability Maximization (APM) problem and designed a practical Influence Decay Model (IDM) as the information diffusion model. NP-hardness is proved for this problem. Two algorithms (Basic Greedy Approach and Scalable Algorithm) with theoretical bounds are proposed for online large-scale social networks. The simulation on real-life social networks validates the proposed algorithms are both effective and efficient. Second problem studied a minimization problem that protect target users from cyber-attacks.

- Rumor Source Detection – In this research, we identified a single rumormonger based only on a set of observed infection stations under the Independent Cascade (IC) model in a complete snapshot of the network obtained at a specific period. We generated a k-station selection problem with a 2-approximation algorithm and derived that an estimator of the rumor source is chosen to be the root node that leads to the observed infection stations. The algorithm bound is proved theoretically and simulated with real social network datasets.

- Interdisciplinary Study in Computer Science and Civil Engineering – use

smartphone accelerometer, gyroscope, and GPS data to map pavement condition at the network level using Geographical Information System (GIS). In this research, we designed and developed both Android and iOS applications that can be installed on drivers' smartphones and vehicles' on-board computers to automatically collect pavement data on a real-time basis. Then the data is consolidated, analyzed, and translated into roughness for pavement monitoring (deterioration rates analysis) and management (strategic budget allocation and service-life prediction for local or state DOTs), as well as for distresses identification, geolocation, and severity analysis for fast pavement corrective maintenance prioritization and planning.

Teaching:

COSC2336	Data Structures and Algorithms
COSC3385	Database Design
COSC4391	Capstone Project
COSC3325	Algorithm Analysis & Foundation
COSC1307	Introduction to Information System Software
COSC3331	E-Commerce Programming
COSC1336	Programming Fundamentals

01/2015 – 08/2019

The University of Texas at Dallas (UTD) *Tyler, USA*
Teaching & Research Assistant – Computer Science Department

Research:

- *Data Communication and Data Management Lab*
    - Real world applications modeling such as content spread maximization, rumor blocking, link prediction, active friending, cyberbullying, community outliers and viral marketing in social networks.
    - Design algorithms with theoretical bound to solve emerging social network issues.
    - Data networks communication and manipulations, such as mining hidden pattern in social networks.
    - Analyze data engineering and data management problems in database systems.

- *Human language Technology Research Institute*
    - Social Media analysis such as sentiment analysis, using machine learning models to predict social media user's behavior, and event detection
    - Argument mining in natural language processing
    - Disputation behavior analysis in online debating forum

- Other topics related to NLP including context generation, emotion detection, etc.

Teaching:

CS 6314	Web Programming Language
CS 3377	C/C++ Programming in Unix Environment
CS 7301	Special Topic: Social Computing
CS 4341	Digital Logic and Computer Design
CS 4384	Automata Theory
CS 6360	Database Design

Publications

Book Chapters

1. **Yi Li**, Ruidong Yan, Weili Wu. "Optimization on Content Spread in Social Network Studies." Nonlinear Combinatorial Optimization. Springer, Cham, 2019

2. Weili Wu, **Yi Li**, Panos M. Pardalos, and Ding-Zhu Du. Data-Dependent Approximation in Social Computing. In Panos M. Pardoalos and Athanasios Migdalas, editors, Open Problems in Optimization and Data Anayasis. Springer International Publishing, 2018.

Journal Articles

3. Damien Stephens, Mena Souliman, Matthew M. Vechione, Mukul Shirvaikar, and **Yi Li**. "Preliminary Development of a Smartphone Application as an Asset to Pavement Management Engineers." Transportation Research Record 2022

4. Ruidong Yan, **Yi Li**, Deying Li, Yongcai Wang, Yuqing Zhu, and Weili Wu. "A Stochastic Algorithm Based on Reverse Sampling Technique to Fight Against the Cyber bullying." ACM Transactions on Knowledge Discovery from Data (TKDD). Volume 15 Issue 4, 1-22. 2021

   UT Tyler Journal List: A+

5. Ruidong Yan, **Yi Li**, Deying Li, Weili Wu, and Yongcai Wang. "SSDBA: the Stretch Shrink Distance Based Algorithm for Link Prediction in Social Networks." Frontiers of Computer Science 15, 151301. (2021)

6. Yapu Zhang, **Yi Li**, Wenguo Yang, and Weili Wu. "Effector Detection Problem in Social Networks." IEEE Transactions on Computational Social Systems, 1 – 10, (2020)

7. Ruidong Yan, Hongwei Du, **Yi Li**, Wenping Chen, Yongcai Wang, Yuqing Zhu, and Deying Li. "Target Users Activation Probablity Maximization with Different Seed Set Constraints in Social Networks." Theoretical Computer Science (2020)

   UT Tyler Journal List: A

8. Jianxiong Guo, **Yi Li**, and Weili Wu. "Targeted Protection Maximization in Social Networks." IEEE Transactions on Network Science and Engineering (2019).

9. Ruidong Yan, **Yi Li**, Weili Wu, and Deying Li. "Rumor blocking through online link deletion on social networks." ACM Transaction at TKDD. 2018.

   UT Tyler Journal List: A+

10. Wenguo Yang, Jianmin Ma, **Yi Li**, Ruidong Yan, Jing Yuan, Weili Wu, and Deying Li. "Marginal gains to maximize content spread in social networks." IEEE Transactions on Computational Social Systems 6, no. 3 (2019): 479-490.

Conference Proceedings

11. Ruidong Yan, **Yi Li**, Deying Li, Yuqing Zhu, Yongcai Wang, and Hongwei Du. "Activation Probability Maximization for Target Users Under Influence Decay Model." In International Computing and Combinatorics Conference, pp. 603-614. Springer, Cham, 2019.

12. Damien Stephens, Mena Souliman, Matthew M. Vechione, Mukul Shirvaikar, and **Yi Li**. "Preliminary Development of a Smartphone Application as an Asset to Pavement Management Engineers." In preceeding of 101st Annual Meeting of Transportation Research Record, January 2022

13. Qiufen Ni, **Yi Li**, Chuanhe Huang, Ruiqi Yang, Haizhou Bao, and Bin Fu. "Maximizing Throughput with Minimum Channel Assignment for Cellular-vanet Het-nets." 2019 IEEE 39th International Conference on Distributed Computing Systems (ICDCS).

14. Jing Yuan, Weili Wu, **Yi Li**, and Ding-Zhu Du. Active Friending in Online Social Networks. In Proceedings of the Fourth IEEE/ACM International Conference on Big Data Computing, Applications and Technologies, pages 139-148. ACM, 2017.

15. Zhongyu Wei, Yang Liu, and **Yi Li**. Is This Post Persuasive? Ranking Argumentative Comments in Online Forum. In Proceedings of the 54th Annual Meeting of the Association of Computational Linguistics (Volumd 2: Short Papers), volume 2, 2016.

16. Zhongyu Wei, Yandi Xia, Chen Li, Ynag Liu, Zachary Stallbohm, **Yi Li** and Yang Jin. A Preliminary Study of Disputation Behavior in Online Debating Forum. In Proceedings of the Third Workshop on Argument Mining (ArgMining2016), pages 166-171, 2016.

Conference Presentation

17. **Yi Li**. "Reverse Sampling Based Stochastic Algorithm to Fight Cyberbullying on Social Network". The 15th International Conference on Algorithmic Aspects in Information and Management (AAIM 2021)

18. Damien Stephens, Mena Souliman, Matthew M. Vechione, Mukul Shirvaikar, and **Yi Li**. SMARTP3M: Smart Pavement Monitoring, Management, and Maintenance

Grants

Presidential Interdisciplinary Grants Program, "SMARTP3M: Smart Pavement Monitoring, Management, and Maintenance", 2020, $13800, Funded

Transportation Consortium of South-Central States, "SMARTP3M: Smart Pavement Monitoring, Management, and Maintenance" 2022, $35,000, Under Review

Activities

Journal Reviewer

IEEE Transaction on Knowledge and Data Engineering

Journal of Combinatorial Optimization

IEEE/ACM transactions on Networking

Theoretical Computer Science

Discrete Mathematics, Algorithms, and Applications

International Journal of Communication Systems

Wireless Communications and Mobile Computing

World Wide Web Journal

Security of Communication and Networks

Wireless Communication and Mobile Computing

Conference Reviewer

International Conference on Algorithmic Aspects in Information and Management (AAIM 2021)

International Conference on Combinatorial Optimization and Applications (COCOA 2020)

IEEE International Conference on Distributed Computing Systems (ICDCS 2019)

ACM SIGKDD Conference on Knowledge Discovery and Data Mining (KDD 2018)

IEEE International Conference on Computer Communications (ICCCN 2018)

IEEE International Conference on Cloud Engineering (IC2E) 2018

Program Committee Chair & Member

International Conference on Algorithmic Aspects in Information and Management (AAIM 2021)

International Conference on Combinatorial Optimization and Applications (COCOA 2020)

IEEE International Conference on Distributed Computing Systems (ICDCS 2019)

International Conference on Algorithmic Aspects in Information and Management (AAIM 2018)

Professional Membership

IEEE Member	2018 - Present
IEEE Young Professionals	2020 - Present
ACM Member	2021 - Present

Professional Development

Certificate in Effective College Instructions (ACUE)

UT Tyler Service

College Faculty/Staff Awards and Research Committee

Teaching Experience

Scale: 5.0-Excellent, 4.0-Above Average, 3.0-Average, 2.0-Below Average, 1.0-Failing

Data Structures and Algorithms

COSC 2336	Spring 2022	In Progress
COSC 2336	Fall 2021	Teacher Rating of 4.31 on a 5.0 scale
COSC 2336	Spring 2021	Teacher Rating of 4.53 on a 5.0 scale
COSC 2336	Fall 2020	Teacher Rating of 4.39 on a 5.0 scale
COSC 2336	Spring 2020	Teacher Rating of 4.36 on a 5.0 scale
COSC2336	Fall 2019	Teacher Rating of 3.35 on a 5.0 scale

Database Design

COSC 3385	Spring 2022	In Progress
COSC 3385	Spring 2021	Teacher Rating of 4.36 on a 5.0 scale

Introduction to Information System Software

COSC 1307	Summer 2021	Teacher Rating of 4.86 on a 5.0 scale
COSC 1307	Spring 2021	Teacher Rating of 4.53 on a 5.0 scale
COSC 1307	Fall 2020	Teacher Rating of 4.40 on a 5.0 scale

Algorithm Analysis and Foundation

COSC 3325	Fall 2021	Teacher Rating of 4.42 on a 5.0 scale

Programming Fundamentals

COSC 1336	Spring 2021	Teacher Rating of 4.5 on a 5.0 scale
COSC 1336	Fall 2019	Teacher Rating of 3.98 on a 5.0 scale

E-Commerce Programming

COSC 3331	Fall 2020	Teacher Rating of 4.09 on a 5.0 scale

Continued Study

Teaching workshops

Spring 2022 – UT Tyler, Designing Courses for Active Learning (Zoom), 1 hour

Spring 2022 – UT Tyler, Online Meetings (Zoom), 1 hour

Spring 2021 – The Faculty Lounge, Engaging Students on the First & Every Day (Web), 0.5 hour

Spring 2021 – The Faculty Lounge, How the Pandemic Made Me a Better Educator (Web), 1 hour

Fall 2020 – UT Tyler, Designing Teaching for Diverse Learners (Zoom), 1.5 hour

Spring 2020 – UT Tyler, Instructional Continuity Q&A Workshop, 1 hour

Spring 2020 – UT Tyler, Proctor U Workshop, 1 hour

Fall 2019 – UT Tyler, What's New in Digital Learning, 1 hour

Teaching Enhancement Course

Summer 2020 to Fall 2020 – ACUE's Course in Effective Teaching Practices (Canvas), 25 hours

Technical Training and Workshops

Fall 2021 – YouTube, MIT 6.006 Dijkstra & Bellman-Ford (Web), 2 hours

Fall 2021 – YouTube, MIT 6.006 Algorithms and Computation (Web), 1 hour

Spring 2021 – YouTube, Microsoft Access – SQL Complete Tutorial (Web), 1 hour

Fall 2020 – AAIM, Profiling Malicious Content Spreaders on online social network (Zoom), 1 hour

Fall 2020 – YouTube, How to Make a WordPress Website (Web), 1 hour