November 14, 2019

Tao WEN

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EDUCATIONAL BACKGROUND

Xi'an Jiaotong University — **Xi'an, China**
*Ph.D. in Systems Engineering, Supervisor: Professor **Xiaohong Guan*** — *09/2019-Expected 07/2023*

Northwestern Polytechnical University — **Xi'an, China**
B.S. in Detection, Guidance and Control Technology — 09/2015-07/2019

Australian National University — **Canberra, Australia**
Summer Session — 01/2019-02/2019

RESEARCH PAPERS

Journal Paper

* Corresponding Author; † Contribute equally.

1. **Tao Wen**, Wen Jiang*. "An information dimension of weighted complex networks," *Physica A: Statistical Mechanics and Its Applications*, vol. 501, pp. 388 – 399, 2018. [PDF]
2. **Tao Wen**, Moxian Song, Wen Jiang*. "Evaluating topological vulnerability based on fuzzy fractal dimension," *International Journal of Fuzzy Systems*, vol. 20, no. 6, pp. 1956–1967, 2018. [PDF]
3. Shuyu Duan, **Tao Wen**, Wen Jiang*. "A new information dimension of complex network based on Rényi entropy," *Physica A: Statistical Mechanics and Its Applications*, vol. 516, pp. 529–542, 2019. [PDF]
4. **Tao Wen**, Wen Jiang*. "Identifying influential nodes based on fuzzy local dimension in complex networks," *Chaos, Solitons & Fractals*, vol. 119, pp. 332-342, 2019. [PDF]
5. **Tao Wen**, Wen Jiang*. "Measuring the complexity of complex network by Tsallis entropy," *Physica A: Statistical Mechanics and Its Applications*. vol. 526, p. 121054, 2019. [PDF]
6. **Tao Wen**, Shuyu Duan, Wen Jiang*. "Node similarity measuring in complex networks with relative entropy," *Communications in Nonlinear Science and Numerical Simulation*. vol. 78, p. 104867, 2019. [PDF]
7. **Tao Wen**, Yong Deng*. "Identification of influencers in complex network by local information dimension," *Information Sciences*. Available online. DOI: 10.1016/j.ins.2019.10.003. [PDF]
8. **Tao Wen**, Yong Deng*. "The vulnerability of community structure in complex network: An entropy approach," *Reliability Engineering & System Safety*. Under Review. [PDF]
9. **Tao Wen**, Danilo Pelus, Yong Deng*. "Vital Spreaders Identification in Complex Networks with Multi-Local Dimension," *Communications in Nonlinear Science and Numerical Simulation*. With Editor. [PDF]
10. Zeyi Liu†, **Tao Wen**†, Yong Deng*, Hamido Fujita. "Cooperation-guided Experts Importance Identification Model With Fuzzy Framework: A Network Design," *IEEE Transactions on Fuzzy Systems*. Under Review.
11. **Tao Wen**, Zhanbo Xu, Jiang Wu, Yadong Zhou, Xiaohong Guan*. "GBCVE: Gravity-based Community Vulnerability Evaluation Model in Social Networks," *IEEE Transactions on Cybernetics*. Prepare to submit.

Conference Paper

1. Shuai Xu, Zichang He, **Tao Wen**, Wen Jiang*. "A Physarum-inspired Model for the Path Planning of Uninhabited Combat Air Vehicle," *The Eighth Chinese Information Fusion Conference*. (In Chinese).
2. **Tao Wen**, Shuyu Duan, Wen Jiang*. "Forecasting time series based on visibility graph and relative entropy," *The Ninth Chinese Information Fusion Conference*. (In Chinese).
3. Shuyu Duan, **Tao Wen**, Xinyang Deng, Wen Jiang*. "Identifying influential nodes based on Tsallis entropy and information dimension," *The Ninth Chinese Information Fusion Conference*. (In Chinese).

SOFTWARE COPYRIGHT

1. **Tao Wen**, Shuang Liang, Wen Jiang. Evaluating Topological Vulnerability Software Based on MATLAB V1.0, 2018SR202109.
2. **Tao Wen**, Shuang Liang, Wen Jiang. Measuring Network Complexity Software Based on MATLAB V1.0, 2018SR221765.
3. **Tao Wen**, Shuyu Duan, Wen Jiang. User Similarity Detecting in Social Network Software Based on MATLAB V1.0, 2019SR0858917.
4. **Tao Wen**, Shuyu Duan, Wen Jiang. Critical Node Identifying in Information Network Software Based on MATLAB V1.0, 2019SR0858914.
5. Shuyu Duan, **Tao Wen**, Xinyang Deng, Wen Jiang. Calculating Network Fractal Dimension Software Based on Rényi Entropy V1.0, 2019SR0456722.
6. Shuyu Duan, **Tao Wen**, Xuguang Liu, Xinyang Deng, Wen Jiang. Importance Node Identifying in Network Based on Tsallis Entropy V1.0, 2019SR0858911.

RESEARCH EXPERIENCE

Finding important properties of nodes and communities in complex network June 2019 – Sep. 2019

Research Assistant ***Advisor: Professor Yong Deng***

- Proposed local information dimension to identify the influential spreaders in complex network, which considered the quasi-local information of nodes and reduced the computational complexity.
- Combined the internal factors and external factors of community to measure the vulnerability of each community, and improved the recognition accuracy in real-world complex network application.
- Assisted Prof. Yong Deng in reviewing the papers submitted for *IEEE Transactions on Industrial Informatics*, *Scientific Reports*, *Fractals*, *Complexity*, *IEEE Access*, *PLoS One*, *Physics A*, *Physics Letters A*, *Computer Science*, *Chinese Journal of Physics*, *Arabian Journal for Science and Engineering*, *International Journal of Modern Physics B*, etc.

Energy optimizing: Improving building energy efficiency through microgrid July 2018 – Aug. 2018

Research Assistant ***Advisor: Professor Xiaohong Guan & Professor Zhanbo Xu***

- Research interests: (i) building energy saving, (ii) optimized operation and management strategy
- Combined the building energy savings with optimization theory (convex optimization), and explored the huge potential for building energy saving through efficient operation.
- Simulated the energy consumption in building energy system through mixed integer programming and scenario tree method based on CPLEX.

Network mining: Exploring the properties of network by applying different dimensions May 2016 – June 2019

Research Assistant ***Advisor: Professor Wen Jiang***

- Promoted information dimension and Rényi dimension into weighted complex network, and explored the fractal and self-similarity properties of complex network.
- Developed several recognition models based on local dimension and fractal dimension, and measured the complexity and vulnerability of complex network, and the similarity and importance of nodes.
- Assisted Prof. Wen Jiang in reviewing the papers submitted for *Applied Intelligence* and *Defence Science Journal*, etc.

Evaluating Topological Vulnerability Based on Fuzzy Fractal Dimension of Complex Networks May 2017 – May 2018

Team Leader National Undergraduate Training Programs for Innovation and Entrepreneurship

- Collected a great deal of data about the American airline networks from Bureau of Transportation Statistics, and processed the network data.
- Proposed a novel method to evaluate topological vulnerability of complex networks based on the fuzzy sets, fractal dimension, and average edge betweenness, and analyzed the vulnerability change of the American airline networks from

2005 to 2013.

An Autonomous Landing Scheme for Cargo Drone Based on Computer Vision May 2017 – May 2018

Researcher National Undergraduate Training Programs for Innovation and Entrepreneurship

- Used Pixhawk as the flight control platform, and processed the images from pan-tilt-zoom (PTZ) camera through airborne computer card.
- Proposed a novel method based on SVM to identify the landing sign and estimate the cargo drone's pose to guide its autonomous landing.

Exploring the Composition and Future Scalability of Smart House Jan. 2019 – Feb. 2019

Course Project Australian National University Summer Session

- Explored the composition of subsystems in smart house based on the Canberra situation, and sought the relationship between different subsystems.
- Designed the detail model of each subsystem, and obtained smart house model based on the trade-off between different component.

HONORS AND AWARDS

The "Challenge Cup" National Undergraduate Extracurricular Academic Science and Technology Contest: **Special First Prize** (**Top 8%**, **Highest award** in the field of information science in natural science papers) Nov. 2019

The "Challenge Cup" National Undergraduate Extracurricular Academic Science and Technology Contest in Shaanxi Area: **Outstanding Winner (TOP 5%**, **Highest award** in the field of natural science papers in NWPU **so far**) May 2019

China National Scholarship (Top 1%) Sep. 2018

Outstanding Student Pacemaker in Northwestern Polytechnical University (TOP 0.1%) Sep. 2018

Global Mathematical Contest in Modeling: **Meritorious Winner** Feb. 2018

Mathematical Contest in Modeling for Chinese Undergraduate Students in Shaanxi Area: **First Prize** Oct. 2017

First Prize scholarship of Northwestern Polytechnical University (**TOP 10%**) Sep. 2017

Second Prize scholarship of AVIC Optronics Institute (**TOP 5%**) Sep. 2017

Global Mathematical Contest in Modeling: **Honorable Mention** Feb. 2017

COMPUTER SKILLS

MATLAB, C language, CPLEX, SPSS, LaTex, Gephi, Origin, Visio, Excel