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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. **T. Wen**, W. Jiang*. "An information dimension of weighted complex networks," *Physica A: Statistical Mechanics and Its Applications*, vol. 501, pp. 388 – 399, 2018. [PDF]
2. **T. Wen**, M. Song, W. Jiang*. "Evaluating topological vulnerability based on fuzzy fractal dimension," *International Journal of Fuzzy Systems*, vol. 20, no. 6, pp. 1956–1967, 2018. [PDF]
3. S. Duan, **T. Wen**, W. 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. **T. Wen**, W. Jiang*. "Identifying influential nodes based on fuzzy local dimension in complex networks," *Chaos, Solitons & Fractals*, vol. 119, pp. 332-342, 2019. [PDF]
5. **T. Wen**, W. Jiang*. "Measuring the complexity of complex network by Tsallis entropy," *Physica A: Statistical Mechanics and Its Applications*. vol. 526, p. 121054, 2019. [PDF]
6. **T. Wen**, S. Duan, W. Jiang*. "Node similarity measuring in complex networks with relative entropy," *Communications in Nonlinear Science and Numerical Simulation*. vol. 78, p. 104867, 2019. [PDF]
7. **T. Wen**, Y. Deng*. "Identification of influencers in complex network by local information dimension," *Information Sciences*. vol.512, pp. 549-562, 2020. [PDF]
8. **T. Wen**, Y. Deng*. "The vulnerability of community structure in complex network: An entropy approach," *Reliability Engineering & System Safety*. Major Revision. [PDF]
9. **T. Wen**, D. Pelus, Y. Deng*. "Vital Spreaders Identification in Complex Networks with Multi-Local Dimension," *Knowledge-Based Systems*. With Editor. [PDF]
10. Z. Liu†, **T. Wen**†, Y. Deng*, H. Fujita. "Cooperation-guided Experts Importance Identification Model With Fuzzy Framework: A Network Design," *IEEE Transactions on Fuzzy Systems*. Under Review.
11. **T. Wen**, Z. Xu, J. Wu, Y. Zhou, X. Guan*. "GBCVE: Gravity-based Community Vulnerability Evaluation Model in Social Networks," *IEEE Transactions on Cybernetics*. Prepare to submit.

Conference Paper

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

dimension," *The Ninth Chinese Information Fusion Conference*. (In Chinese).

SOFTWARE COPYRIGHT

1. **T. Wen**, S. Liang, W. Jiang. Evaluating Topological Vulnerability Software Based on MATLAB V1.0, 2018SR202109.
2. **T. Wen**, S. Liang, W. Jiang. Measuring Network Complexity Software Based on MATLAB V1.0, 2018SR221765.
3. **T. Wen**, S. Duan, W. Jiang. User Similarity Detecting in Social Network Software Based on MATLAB V1.0, 2019SR0858917.
4. **T. Wen**, S. Duan, W. Jiang. Critical Node Identifying in Information Network Software Based on MATLAB V1.0, 2019SR0858914.
5. S. Duan, **T. Wen**, X. Deng, W. Jiang. Calculating Network Fractal Dimension Software Based on Rényi Entropy V1.0, 2019SR0456722.
6. S. Duan, **T. Wen**, X. Liu, X. Deng, W. 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 dimension 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 of Networks Based on Fuzzy Fractal Dimension 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 Support Vector Machine (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

[Nov. 2019] 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.

[May 2019] The "Challenge Cup" National Undergraduate Extracurricular Academic Science and Technology Contest in Shaanxi Area: **Outstanding Winner** (**TOP 5%**)

Best grade in the field of natural science papers in Northwestern Polytechnical University **so far**.

[Sep. 2018] **China National Scholarship** (**Top 1%**)

Highest honor for students' year achievement in the School of Electronics and Information.

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

Only **10 undergraduates** are awarded among more than 12,000 undergraduates in NWPU in 2018.

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

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

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

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

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

COMPUTER SKILLS

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