Zeyi Liu

Ph. D. Student
Tsinghua University
Department of Automation
Beijing, 100084
P. R. China

Gender: Male
Tel: +86 153-2163-8693
Date of Birth: Jul. 8^{th}, 1999
E-mail: liuzy21@mails.tsinghua.edu.cn
Personal Academic Homepage: http://liuzy0708.com

EDUCATION

Southwest University, School of Computer and Information Science — Chongqing, P.R. China
Bachelor of Engineering — *Sept. 2017 - Jun. 2021*
Tsinghua University, Department of Automation — Beijing, P.R. China
Ph. D. Candidate in Engineering — *Sept. 2021 - Present*

EXPERIENCE

Research Assistant — Jul. 2019 – Sept. 2019
UESTC, Institute of Fundamental and Frontier Sciences — *Chengdu, Sichuan Province, P.R. China*

Research Assistant — Jan. 2020 – Aug. 2021
Tsinghua University, Department of Automation — *Beijing, P.R. China*

Research Assistant — Jun. 2021 – Aug. 2021
Chongqing University, School of Big Data and Software Engineering — *Chongqing, P.R. China*

PROJECTS

National Natural Science Foundation of China under Grant 61573290, 61503237, 61733009, 61973332 (Participant)
National Key Research and Development Program of China under Grant 2017YFA0700300 (Participant)
Key Project from Natural Sciences Foundation of Guangdong Province under Grant 2018B030311054 (Participant)
Innovative Entrepreneurial Training Plan Program of College Students in Chongqing (Hoster)

AWARDS

Tsinghua University

National Scholarship of P. R. China for Graduates (2022)

Southwest University

Candidate for the 12-th *China Youth Science and Technology Innovation Award* of Chongqing District
Outstanding Graduates of Colleges and Universities in Chongqing (2021)
Outstanding Graduates of Southwest University (2021)
Model to 2019-2020 Academic Year Outstanding Student of Southwest University (2020)
Merit Student Award, Academic Technology Award, Innovation and Entrepreneurship Award (2020)
National Scholarship of P. R. China for Undergraduate Students (2020)
Special Prize Scholarship and First Prize Scholarship of Southwest Univeristy (2020, 2019)
TangLiXin Scholarship (2019)
The 5^{th} China College Students *Internet* + Innovation and Entrepreneurship Competition: National Silver Award
The 28^{th} National Mathematical Contest in Modeling: National Second Prize
MCM/ICM in 2020: Meritorious Winner

RESEARCH FIELDS

Real-time Safety Assessment Approaches of Dynamic Systems in Non-stationary Environment

1) Online active learning methods and its optimization
2) Detection and adaptation methods of concept drift
3) Incremental learning and continual learning technology

Real-time Multi-mode Fault Diagnosis of Dynamic Systems under Variable Operating Conditions

1) Online semi-supervised learning methods and its optimization
2) Imbalance problem in the framework of online learning
3) eXplainable artificial intelligence (XAI) technology

RESEARCH STATS

Google Citation: 220

H-index: 9

i10-index: 9

JOURNAL PUBLICATIONS

1. **Z. Liu**, X. He, Dynamic submodular-based learning strategy in imbalanced drifting streams for real-time safety assessment in nonstationary environments, *IEEE Transactions on Neural Networks and Learning Systems*, In Press, JCR Q1, *IF*: 10.4, CAA-A, CCF-B.
2. M. Xu, G. Zeng, Y. Song, Y. Cao, **Z. Liu**, X. He, Ivrr-PPG: an illumination variation robust remote-PPG algorithm for monitoring heart rate of drivers, *IEEE Transactions on Instrumentation and Measurement*, vol. 72, no. 3515510, pp. 1-10, 2023, JCR Q1, *IF*: 5.6, CAA-B.
3. **Z. Liu**, X. He, Real-time safety assessment for dynamic systems with limited memory and annotations, *IEEE Transactions on Intelligent Transportation Systems*, vol. 23, no. 9, pp. 10076-10086, 2023, In Press, JCR Q1, *IF*: 8.5, CAA-A, CCF-B.
4. **Z. Liu**, Y. Zhang, Z. Ding, X. He, An online active broad learning approach for real-time safety assessment of dynamic systems in nonstationary environments, *IEEE Transactions on Neural Networks and Learning Systems*, 2022, In Press, JCR Q1, *IF*: 10.4, CAA-A, CCF-B.
5. **Z. Liu**, J. Zhang, X. He, Q. Zhang, G. Sun, D.-H. Zhou, Fault diagnosis of rotating machinery with limited expert interaction: a multi-criteria active learning approach based on broad learning system, *IEEE Transactions on Control Systems Technology*, vol. 31, no. 2, pp. 953-960, 2023, JCR Q1, *IF*: 4.8, CAA-A.
6. **Z. Liu**, Y. Deng, R. R. Yager, Measure-based group decision making with principle-guided social interaction influence for incomplete information: a game theoretic perspective, *IEEE Transactions on Fuzzy Systems*, vol. 30, no. 4, pp. 1149-1163, 2022, JCR Q1, *IF*: 11.9, CAA-A, CCF-B.
7. **Z. Liu**, Y. Deng, Y. Zhang, Z. Ding, X. He, Evidential group interaction-based safety assessment for deep-sea manned submersibles, *IEEE Transactions on Instrumentation and Measurement*, vol. 70, no. 3523014, pp. 1-14, 2021, JCR Q1, *IF*: 5.6, CAA-B.
8. **Z. Liu**, F. Xiao, C.-T. Lin, B. Kang, Z. Cao, A generalized golden rule representative value for multiple-criteria decision analysis, *IEEE Transactions on Systems, Man, and Cybernetics: Systems*, vol. 70, no. 5, pp. 3193-3204, 2021, JCR Q1, *IF*: 8.7, CAA-A, CCF-B.
9. **Z. Liu**, X. He, Y. Deng, Network-based evidential three-way theoretic model for large-scale group decision analysis, *Information Sciences*, vol. 547, pp. 689-709, 2021, JCR Q1, *IF*: 8.1, CAA-A$^+$, CCF-B.
10. R. Tao, **Z. Liu**, R. Cai, K. Cheong, A dynamic group MCDM model with intuitionistic fuzzy set: perspective of alternative queuing method, *Information Sciences*, vol. 555, pp. 85-103, 2021, JCR Q1, *IF*: 8.1, CAA-A$^+$, CCF-B.

11. **Z. Liu**, F. Xiao, An intuitionistic linguistic MCDM model based on probabilistic exceedance method and evidence theory, *Applied Intelligence*, vol. 50, pp. 1979-1995, 2020, JCR Q1, *IF*: 5.3, CCF-C.
12. **Z. Liu**, F. Xiao, An interval-valued exceedance method in MCDM with uncertain satisfactions, *International Journal of Intelligent Systems*, vol. 34, no. 10, pp. 2676-2691, 2019, JCR Q1, *IF*: 7.0, CAA-A, CCF-C.
13. **Z. Liu**, F. Xiao, An intuitionistic evidential method for weight determination in FMEA based on belief entropy, *Entropy*, vol. 21, no. 211, pp. 1-16, 2019. JCR Q1, *IF*: 2.7.
14. **Z. Liu**, F. Xiao. An evidential aggregation method of intuitionistic fuzzy sets based on belief entropy, *IEEE Access*, vol. 34, no. 10, pp. 68905-68916, 2019, JCR Q1, *IF*: 3.9.

COMFERENCE PUBLICATIONS

1. M. Mao, **Z. Liu**, X. He. A bearing fault diagnosis method based on active learning by feature interpolation, *The 33rd Chinese Process Control Conference, 2022*, in Jul., Urumqi, Xinjiang, China, CAA-A.
2. S. Hu, **Z. Liu**, X. He. Confusion model for real-drift detection in chunk data streams, *Proceedings of 13th EAI International Conference on Sensor Systems and Software, 2022*, in Dec., Dalian, Liaoning, China.
3. **Z. Liu**, S. Hu, X. He. Real-time safety assessment of dynamic systems in non-stationary environments: A review of methods and techniques, *CAA Symposium on Fault Detection, Supervision, and Safety for Technical Processes (SAFEPROCESS), 2023*, in Sept., Yibin, Sichuan, China, CAA-A.
4. C. Li, **Z. Liu**, X. He. An evidential real-time multi-mode fault diagnosis approach based on broad learning system, *The 34th Chinese Process Control Conference, 2023*, in Jul., Guiyang, Guizhou, China, CAA-A.

PATENTS

1. X. He, **Z. Liu**, A real-time safety assessment method based on dynamic submodular learning framework.
2. X. He, **Z. Liu**, A real-time safety assessment method guided by the interpretability of dynamic models.
3. X. He, P. Han, **Z. Liu**, An online semi-supervised fault diagnosis method based on few pseudo-label-first strategy.
4. X. He, C. Li, **Z. Liu**, A real-time fault diagnosis method based on latent variables and broad learning system.
5. X. He, S. Hu, **Z. Liu**, A real-time safety assessment method based on distributional confusion.
6. S. Chen, **Z. Liu**, *et al.*, A dynamic adaptive health status prediction method based on incremental broad learning system.
7. D. Cai, **Z. Liu**, *et al.*, A human-in-the-loop-based dynamic threshold adjustment approach for virtual health indicators.
8. D. Zou, **Z. Liu**, *et al.*, A multi-step prediction method for remaining useful life based on weighted broad learning system.

REVIEW ACTIVITIES

IEEE Transactions on on Pattern Analysis and Machine Intelligence (IEEE TPAMI)	2022 – Present
IEEE Transactions on Neural Networks and Learning Systems (IEEE TNNLS)	2022 – Present
IEEE Transactions on Cybernetics (IEEE TCYB)	2022 – Present
Journal of Computational and Cognitive Engineering (JCCE)	2022 – Present
Systems Science and Control Engineering (SSCE)	2022 – Present
Journal of Engineering (JoE)	2021 – Present
IEEE Congress on Evolutionary Computation (IEEE CEC)	2022, 2023

IEEE Conference on Fuzzy Systems (FUZZ-IEEE)	2022, 2023
International Joint Conference on Neural Network (IJCNN)	2022
Chinese Control Conference (CCC)	2022, 2023
China Automation Congress (CAC)	2022

SOCIAL MEMBERSHIPS

Chinese Association of Automation	Member
Chinese Association for Artificial Intelligence	Member

STUDENT MENTORING

Chen Li	M.E. Candidate
Tsinghua University, Department of Automation	*May. 2022 - Present*
Songqiao Hu	Research Assistant
Beijing Institute of Technology, School of Automation	*Jul. 2022 - Present*
Pengyu Han	Research Assistant
Beijing Institute of Technology, School of Automation	*Sept. 2022 - Present*
Jinghao Yang	Research Assistant
Tsinghua University, Department of Automation	*Oct. 2022 - May. 2023*
Mengfei Mao	Research Assistant
Chongqing University, College of Automation	*Apr. 2022 – Jun. 2022*
Guokai Yan	Research Assistant
Tsinghua University, Department of Automation	*May. 2022 - Jul. 2022*