Haobin Ke

School of Automation
Central South University
Changsha, China
Cell phone: (+86) 135-2849-6581
Email: haobin.ke@outlook.com or
haobin.ke@csu.edu.cn

Research Interests

- Machine Learning & Graph Learning
- Data-driven fault diagnosis (i.e., anomaly detection)
- Computational intelligence

Education Background

- 09/2021-Now: M.E. student in Control Science and Engineering, School of Automation,
  Central South University, Changsha, China
  Skills Gained: Weighed average marks 87.3 (Degree A);
  1) Designing intelligence fault diagnosis algorithms (mainly Graph learning-based methods) for mechanical or electric systems;
  2) Developing real-time miner action recognition algorithms based on advanced computer vision methods (such as YoloV5);
  3) Operating and maintaining mine safety monitoring system based on Python;
  4) Developing information management system by WPF framework and SQL database;
  5) Enhancing skills of writing and reviewing academic papers and invention patents; Developing oral and poster presentation skills;
  6) Applying and independently accomplishing an innovation project for postgraduate students;
  7) Working as a research assistant, mainly responsible for equipment maintenance and freshmen technical guidance.
- 09/2017-06/2021: BEng in Automation (Outstanding Graduates), School of Automation,
  Guangdong University of Technology, Guangdong, China
  Skills Gained: Weighed average marks 89.36 (Ranked 3rd in major); Developing clear interest in electronic design and computer science; Software skills including Python, C#, SQL and SCM programme.

Language Level

- CET4/CET6: 568/432
- IELTS: 6.5 overall (Reading:7.5; Writing:6.5)

Publications （* In the college of applicant, if the supervisor is the first or corresponding author, the research student who is the second author is often seen as a co-first author who contributed equally to the work.）

Journal Papers

1. Z. Chen, **H. Ke,** etc., "Multi-Channel Domain Adaptation Graph Convolutional Networks-Based Fault Diagnosis Method and With Its Application," *IEEE Transactions on Industrial Informatics* (JCR-Q1, IF=11.648), 2023, vol. 19, no. 6, pp. 7790-7800, 2023. (Supervisor as the first author).

2. J. Xu, **H. Ke,** Z. Chen, etc., "Over-smoothing Relief Graph Convolutional Network-Based Fault Diagnosis Method With Application to the Rectifier of High-Speed Trains," *IEEE Transactions on Industrial Informatics* (JCR-Q1, IF=11.648), vol. 19, no. 1, pp. 771-779, 2022. (Supervisor as the corresponding author).

3. **H. Ke,** Z. Chen, etc., "Self-adaptive Selection Graph Pooling Based Fault Diagnosis Method with Its Robustness and Interpretability Analysis," *IEEE Transactions on Neural Networks and Learning Systems* (JCR-Q1, IF=14.255), (Under Review).

Conference Papers

1. **H. Ke,** Z. Chen, etc., "Time-frequency Hypergraph Neural Network for Rotating Machinery Fault Diagnosis with Limited Data," *The 2023 IEEE 12th Data Driven Control and Learning Systems Conference* (EI conference), 2023. **(Best paper award finalist)**
2. Z. Chen, J. Xu, **H. Ke,** etc., "Graph Convolution Network-Based Fault Diagnosis Method for The Rectifier of The High-speed Train," *The 2021 4th IEEE International Conference on Industrial Cyber-Physical Systems* (EI conference), 2021, pp. 491-497.

Invention Patents

1. **H. Ke,** Han. W, etc., "An Electrospinning Dual Channel Syringe with Its Instructions," China Patent, CN109989120B (Authorised), September. 2021.

2. **H. Ke,** Xin. X, etc., "A Fitting Platform Based on Three-dimensional Rotating Scanning," China Patent, CN111536922B (Authorised), May. 2022.

3. Z. Chen, **H. Ke,** etc., "A Novel Fault Diagnosis Method of High-speed Train Traction System Under Varying Working Conditions," China Patent, CN114994426A (Under Pending), September. 2022, (Supervisor as the first inventor).

Research Funding/Projects

1) The Program of National Natural Science Foundation of China & Fundamental Research Foundation for Postgraduate Student. "Research on Few Samples Fault Diagnosis of Railway Electric Traction System Based on Graph Network" Jan.2021-Dec.2023 (Participator). *Responsibilities*: a) Construct graph topology of traction system based on physical mechanism and data similarity b) Adopt the graph mapping method to analyse the fault diagnosability of traction systems; c) Establish advanced graph learning methods for high-precision health monitoring for the rail transit traction drive systems.

2) Corporate Partnership Project, "Intelligent monitoring platform for coal mine safety production" Dec. 2021-Now (Main member in charge). *Responsibilities*: a) Communicate and report project progress with partner enterprise. (The monitoring platform has been deployed to several coal mines in Hunan Province and connected with the National Mine Safety Administration); b) Participate in the whole process development of the monitoring platform, including equipment adjusting, system scheme design, model training, alarm logic construction, algorithm deployment, on-site testing, etc;

Awards

- First Class Undergraduate Scholarship in 2017, 2018 and 2019.

- Model Student of Academic Records in 2017, 2018 and 2019.

- Honourable Winner of Mathematical Contest in Modelling in 2019.

- Outstanding Graduate of Guangdong University of Technology in 2021.

- Top Ten Outstanding Graduates in School of Automation, 2021.

- Outstanding Undergraduate Theses of Guangdong University of Technology in 2021.

- Postgraduate Scholarship in 2021, 2022, 2023.

- The 2nd Prize of the 19th China Postgraduate Mathematical Contest in Modelling, 2022.

- The best paper award finalist in the 2023 IEEE 12th Data Driven Control and Learning Systems Conference