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[\[CV_YYang.pdf\]](#) [\[Google Scholar\]](#) [\[GitHub\]](#) [\[LinkdeIn\]](#) [\[CSDN\]](#) [\[Wechat\]](#)

Research Interest

I work in the field of time-series, industrial signal processing, optical fiber, multi-sensor fusion, data mining, machine learning and deep learning theory. Currently, I focus on the following research topics:

- AI and distributed optical fiber based long-distance pipeline safety early warning system
- Spatio-temporal optical fiber signal processing and identification
- Workload I/O prediction, feature extraction and data prefetching in storage systems
- Time-series forecasting
- Semi-supervised signal processing and signal denoising
- Feature and model fusion

Education and Intern

- 2021.2-2021.8 AI Research Intern in Decision Making & Reasoning Lab, [Huawei Noah'S Ark Lab](#).
- 2019.9-NOW M.E. in [Department of Automation, Tsinghua University](#). GPA 3.98/4.0, Rank 1/65
- 2019.1-2019.2 Exchange student in Artificial intelligence field, [University of Cambridge](#).
- 2015.9-2019.6 B.E. in [School of Artificial Intelligence and Automation, Huazhong University of Science and Technology, HUST](#).
(Experimental Class on Innovation at the Crossroads of Automation and Science) GPA 90.45/100 (3.91/4.0), Rank 10/300

Publications

Journals:

- [3] **Y. Yang**, H. Zhang, Y. Li, "Pipeline Safety Early Warning by Multi-feature-fusion CNN and LightGBM Analysis of Signals from Distributed Optical Fiber Sensors," *IEEE Transactions on Instrumentation and Measurement (TIM)*, 2021. (Accepted) (**Q1**, **IF=4.016**)
- [2] **Y. Yang**, H. Zhang, Y. Li, "Long-Distance Pipeline Safety Early Warning: A Distributed Optical Fiber Sensing Semi-Supervised Learning Method," *IEEE Sensors Journal (IEEE Sensors J)*, 2021. (Accepted and Early Access) (**Q1**, **IF=3.301**) [[Link](#)] [[PDF](#)] [[BibTeX](#)]
- [1] Z.Xu, F. Wu, **Y. Yang**, Y. Li, "ECT Attention Reverse Mapping algorithm: visualization of flow pattern heatmap based on convolutional neural network and its impact on ECT image reconstruction," *Measurement Science and Technology (MST)*, vol. 32, no. 3, pp. 035403, 2020. (**Q1**, **IF=2.046**) [[Link](#)] [[PDF](#)] [[BibTeX](#)]

Conferences:

- [4] X.Li, Q.Shi, G.Hu, L.Chen, H.Mao, **Y. Yang**, M.Yuan, J.Zeng and Z.Cheng, "Block Access Pattern Discovery via Compressed Full Tensor Transformer," *30th ACM International Conference on Information and Knowledge Management (CIKM 2021)*, 2021. (**CCF-B**)
- [3] **Y. Yang**, Y. Li, H. Zhang, "Pipeline Safety Early Warning Method for Distributed Signal using Bilinear CNN and LightGBM," *Proceeding of the IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP 2021)*, 2021. (**CCF-B**) [[Link](#)] [[PDF](#)] [[BibTeX](#)] [[Poster](#)] [[Slides](#)] [[Video](#)] [[Picture_oral](#)]
- [2] **Y. Yang**, Y. Li, T. Zhang, Y. Zhou, and H. Zhang, "Early Safety Warnings for Long-Distance Pipelines: A Distributed Optical Fiber Sensor Machine Learning Approach," *Proceeding of the Thirty-Fifth AAAI Conference on Artificial Intelligence (AAAI 2021)*, 35(17), 14991-14999, 2020. (**CCF-A**) [[Link](#)] [[PDF](#)] [[BibTeX](#)] [[Poster](#)] [[Slides](#)] [[Video](#)] [[Picture_oral](#)]
- [1] H. Zhang, **Y. Yang**, M. Yang, L. Min, Y. Li, X. Zheng, "A Novel CNN Modeling Algorithm for the Instantaneous Flow Rate Measurement of Gas-liquid Multiphase Flow," *Proceedings of the 2020 12th International Conference on Machine Learning and Computing (ICMLC 2020)*, pp. 182-187, 2020. [[Link](#)] [[PDF](#)] [[BibTeX](#)]

Workshops, Posters and Others:

- [3] **Y. Yang**, Y. Li and H. Zhang, "Long-Distance Pipeline Safety Early Warning: A Distributed Optical Fiber Sensor Deep Learning Approach," *2021 IEEE the 6th Optoelectronics Global Conference (OGC 2021)*, 2021. (**Abstract & Presentation**)
- [2] **Y. Yang**, "Long-distance Oil and Gas Transportation Pipeline Safety Early Warning System Based on Deep Learning Approach," *The XVII International Forum-Contest of Students and Young Researchers Topical Issues of Rational Use of Natural Resources*, in

- [1] **Y. Yang**, H. Zhang, Y. Li, "Pipeline safety warning system based on distributed optical fiber sensing," *The 13th Doctoral Candidate Nanshan Academic Forum of Guangdong-Hong Kong-Macau Grand Bay District & No. 635 Doctoral Forum, Tsinghua University*, in Shenzhen, China, 2021. (**Oral & First prize**) [[PDF](#)]

Patents:

- [2] **Y. Yang**, H. Zhang, Y. Li, "A method for feature extraction of optical fiber warning signals for oil and gas long-distance pipelines", Chinese invention patents, 2021.
- [1] M. Zhang, G. Wu, Y. Li, **Y. Yang**, "A complex multi-frequency real-time capacitance tomography imaging method based on multiple measurement vectors", Chinese invention patents, 2020.

Projects

Open-Source Projects:

- **Easy-RL**: A deep reinforcement learning tutorial and has already collected **2.4k more stars** on GitHub, which includes [an e-book](#) and [an online tutorials](#). Also, here are some introductions to our tutorials. [[Link1](#)] [[Link2](#)] [[Link3](#)]
- **AcademicTrends Analysis**: An data-mining-based tutorial on the analysis of academic frontier trends of arxiv platform. I am the main person in charge. Here is [a video](#) and [a competition](#) on Aliyun Tianchi. Also, here are some introductions to our tutorials. [[Poster](#)] [[Link1](#)] [[Link2](#)]
- **Ensemble Learning**: An ensemble learning tutorial. And there is [a video](#) of case study and introductions to our tutorials. [[Link](#)]
- Original and translated articles in the field of data science as follows. [[SVP: An efficient data selection method for deep learning.](#)] [[Four types of classification tasks in machine learning.](#)] [[Handling missing values in data.](#)] [[Deriving decision tree algorithms.](#)] [[NLP-based COVID-19 Fake News Detection.](#)] [[Original | AI-based intelligent detection of acute intracranial haemorrhage types.](#)]
- More open source content can be found on [CSDN](#) and [GitHub](#).

Research Projects:

- 2019, **Inter-prediction for Multiview video coding**. [[PDF](#)] [[Slides](#)]
- 2019-2020, Research on long-distance fiber optic safety monitoring and early warning technology for pipelines in complex environments with PetroChina.
- 2020, Teaching assistant of [Rakesh Kumar](#), professor of electrical and computer engineering at [UIUC](#), USA. The class name is "Artificial Intelligence for Undergraduate". [[Certification](#)]
- 2020, Teaching assistant of [Nicholas Lane](#), professor of computer science at [Cambridge](#), UK. The class name is "Introduction to Deep Learning". [[Certification](#)]
- 2021, Conducted research on workload I/O time-series prediction for storage systems in Decision Making & Reasoning Lab, Huawei Noah'S Ark Lab. The work is summarised in a paper that will be submitted to AAAI22.

Awards

- Kaggle Competitions Expert, Top 1,000 (0.7%).
- 2020, National Second Prize in the 17th National Postgraduate Mathematical Modelling Competition.
- 2020, Second Prize Scholarship, Tsinghua University.
- 2019, Outstanding Undergraduate, HUST.
- 2018, First Prize in the 13th National Student Smart Car Competition, Wireless Energy Saving Category (**National Champion**).
- 2018, First(Grand) Prize of Goodix Scholarship, HUST.
- 2018, National Encouragement Scholarship, Ministry of Education in China.
- 2018, Outstanding Individual of Innovation and Entrepreneurship Activities, HUST.
- 2017, First Prize in the South China of the 12th National Student Intelligent Vehicle Competition, Opto-electronic Balance Category.

Activities and Volunteering

- 2020, During the Covid-19 epidemic, as a volunteer of the Tsinghua University Graduate Student Association's anti-epidemic activities, I provided one-on-one support to the children of frontline medical staff in Wuhan for their studies.
- 2020, During the covid-19 epidemic, I recorded an original song "Into the Spring" with TAP Choir. [[News](#)]
- 2019, Debate chairman of the Shenzhen government-sponsored university debate tournament. [[Picture](#)]
- 2019, Member of the Tsinghua University Shenzhen TAP Choir, participating in the "Ode to the Motherland" performance in Shenzhen (at Shenzhen Grand Theater).
- 2018, Participants representing more than 100 universities took the oath at the 13th National Student Smart Car Competition South China Region. [[News](#)]
- 2017, Top 10 Singers of the School of Artificial Intelligence and Automation, HUST.
- 2015-2019, Member of the College's hosting team and hosted two welcome parties and a graduation party.
- 2010, As a representative of middle school students from Shijiazhuang, Hebei Province, I went on a half-month government-to-government visit to the friendly cities of Nagano-ken, Japan.