Qi Zhang

CONTACT INFORMATION	School of Safety Science	*Phone*: (+86) 13146951336
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EDUCATION

Tsinghua University (THU)
PhD candidate   September 2021 – Present
• GPA: 3.95/4 (Department Ranking 2nd)
• Research Interests: Characterization, transportation, and toxicological study of thermal runaway particles in lithium-ion batteries.
• Major: Safety Science and Engineering   • Mentor: Professor Xiaole Zhang

China University of Mining and Technology, Beijing (CUMTB)
Bachelor of Engineering   September 2017 – June 2021
• GPA:3.69/4 (Department Ranking within Top 10%)
• Major: Fire Engineering

RESEARCH EXPERIENCE

Program with HTX, Singapore   2024 - Present
• Conducting combustion tests on electric vehicles and vehicle battery packs, then collecting particle matter generated during thermal runaway.
• Analyzing the composition of particle matter generated by thermal runaway of lithium-ion batteries and evaluating the toxicity through oxidation potential assessment.

National Key R&D Program of China   2021-2024
• Modeled the actual 3D structure of a large and complex warehouse and constructed a scenario library containing over 240,000 pieces of simulation data.
• Established a warehouse deep fire traceability and localization model for realizing 3D positioning based on improved LSTM Neural Network.
• Achieved a remarkably low loss of only 3×10^{-3} in quickly calculating the location and intensity of fire, providing effective situational awareness information for firefighters.

Analysis of Monitoring Data for Urban Safe Operation Program   2022
• Drawn Pearson correlation analysis and autocorrelation maps based on the monitoring data of a certain month's water supply pipeline network.
• Used algorithms such as One-Class SVM, Isolation iForest, Elliptic Envelope, DBSCAN, etc. for anomaly detection of temporal data.

Analysis of Population Fertility Intention Assignment   2022
• Improved the SIR fertility structure model applicable to predictions of female structure based on the state transformation process existing in the female fertility stage, the total population accuracy rate by prediction can reach 99.945%.
• Poster session and oral presentation at National Conference on Big Data Social Computing at Hangzhou, China, August 2022.

PUBLICATIONS	**Qi Zhang**, Yongfu Tian, Jianguo Chen*, Xiaole Zhang, Zhang Qi. To ensure the safety of storage: Enhancing accuracy of fire detection in warehouses with deep learning models [J]. ***Process Safety and Environmental Protection***, 2024, 190: 729-743. [https://doi.org/10.1016/j.psep.2024.07.0869] [JCR Q1, IF=6.9]
	Qi Zhang, Difeng Zhu, Heng Zhang, et al. Prediction of female fertility structure and population change in China by modified SIR model [C]. ***Big Data and Social Computing***, 2022: 57-79. [Link] [Ei Compendex]
	Yudie Jianyao, **Qi Zhang**, Liang Ge, et al. Technical methods of national security supervision: Grain storage security as an example [J]. ***Journal of Safety Science and Resilience***, 2023, 4(1): 61-74. [https://doi.org/10.1016/j.jnlssr.2022.09.004] [JCR Q1]
	Yuheng Cheng, **Qi Zhang**, Xiaole Zhang. (2024). Exploring the integration of large language Models and Analytical Hierarchy Process for multi-indicator importance analysis in the safety research [C]. ***IEEE AICON 2024***. [Ei Compendex, in Press]
PATENTS	**Qi Zhang**, Xiaole Zhang, et al. *Particle emission transportation device for lithium battery after thermal runaway*. (Application No. 02411467019.7)
	Qi Zhang, Jianguo Chen, Yongfu tian. *Accurate Fire Source Localization Method and Device Based on Deep Learning*. (Application No. 02411608070.5)
	Qi Zhang, Beijing Xie, Yinuo Sun. *A Combined Sensor End Installation Device for Dynamic Calibration of SHPB*. (Patent No. ZL 201922144592.5)
	Difeng Zhu, **Qi Zhang**, Sijia Sun. *A Novel of Blue Ice Automatic Fireproof Rolling Shutter Door*. (Patent No. ZL 202020823099.6)
	Sijia Sun, **Qi Zhang**. *A Smoke Exhaust Auxiliary Device for Fire Protection Engineering*. (Patent No. ZL 202020810577.x)
	Andong Chen, **Qi Zhang**, et al. *A fire detection device for building cable wells*. (Patent No. ZL 201922278478.1)

AWARDS & HONOR		
	The First Prize Scholarship, Tsinghua University.	2024
	The Second Prize Scholarship, Tsinghua University.	2022
	Outstanding Graduate, CUMTB.	2021
	Individual Scholarship, CUMTB.	2020
	National Encouragement Scholarship, CUMTB.	2020
	The First Prize Scholarship, CUMTB.	2019
	Merit Student, CUMTB.	2018

PERSONAL SKILLS		
	Programming	Python, MATLAB, R, C, LaTeX
	Applications	Origin, SPSS, Neo4j, SQL Server
	Simulation	COMSOL, FDS, CAD, ArcGIS
	Interests	Traveling, Photography, Video Editing
	Languages	Chinese, **English (IELTS: 7)**, Korean