PENGGAO YAN

PhD, Dept. of Aeronautical and Aviation Engineering, The Hong Kong Polytechnic University, Hong Kong, China
peng-gao.yan@connect.polyu.hk | https://jasonyanxx.github.io/ | +86 18271737566

EDUCATION

The Hong Kong Polytechnic University, Dept. of Aeronautical and Aviation Engineering Hong Kong, China
PhD, Satellite Communication and Navigation 2022-Dec 2024 (Expected)

The Hong Kong Polytechnic University, Dept. of Civil and Environmental Engineering Hong Kong, China
PhD, Construction and Transportation 2021-2022

Wuhan University, School of Remote Sensing and Information Engineering Wuhan, China
MSc, Pattern Recognition and Intelligent System 2018-2021

Wuhan University, Electronic Information School Wuhan, China
BSc, Communication Engineering 2014-2018

HONORS & AWARDS

- Best Student Paper Award in ION GNSS+ 2024 2024
- HKSAR Government Scholarship Fund - Reaching Out Award 2024
- ION Student Registration Grants 2023
- PolyU Presidential PhD Fellowship 2021
- Postgraduate Scholarship 2019
- Excellent Bachelor's Thesis 2018
- National Encouragement Scholarship 2017
- Second Price in National College Student Intelligent Car Race 2017
- First Price in National Undergraduate Electronics Design Contest 2017

RESEARCH INTEREST

- Non-Gaussian error modeling, fault detection and integrity monitoring for localization systems
- Control-aided localization for autonomous vehicles in extreme conditions
- Collaborative positioning and integrity monitoring in urban areas

TEACHING EXPERIENCE

Intelligent Positioning and Navigation Laboratory, PolyU Hong Kong, China
Mentor 2023-2024

- Supervise a research assistant to conduct the overbounding research through weekly meetings.
- Provide guidance and feedback to a PhD student on writing conference and journal papers

Electronic Design and Robotics Innovation Laboratory, Wuhan University Wuhan, China
Trainer Summer 2019

- Led undergraduate students to participate in the robot modeling competition, designed the robot to complete the fixed-point firefighting task
- Designed competition plans, organized workshops to discuss and solve technical difficulties, conducted experimental skills training for undergraduates
- One of the three teams that I led won the first prize in the competition

PUBLICATIONS (*: Corresponding author)

8 SCI Journal Papers in JCR Q1 and 6 Conference papers (as of 31 Dec 2024)
Google Scholar Citations: 161 **WOS** Citations: 112

1. **Yan, P.** (2024). Jackknife Test for Faulty GNSS Measurements Detection under Non-Gaussian Noises. In *Proceedings of the 37th International Technical Meeting of the Satellite Division of The Institute of Navigation (ION GNSS+ 2024)* (pp. 1619–1641). (**Best Student Paper Award**)

2. **Yan, P.**, Zhong, Y., & Hsu, L. T. (2024). Principal Gaussian Overbound for Heavy-tailed Error Bounding. *IEEE Transactions on Aerospace and Electronic Systems*. https://doi.org/10.1109/TAES.2024.3448405
3. **Yan, P.**, Hu, Y., Wen, W., & Hsu, L. T. (2024). Isolation of Multiple Faults for GNSS Positioning: An Incrementally Expanding Approach. *IEEE Sensors Journal*. (Accept)
4. **Yan, P.**, Li, Z., Huang, F., Wen, W., & Hsu, L. T. (2024). Fault Detection Algorithm for Gaussian Mixture Noises: An Application in LiDAR/IMU Integrated Localization Systems. Submitted to *NAVIGATION*. (Accept)
5. **Yan, P.**, Xia, X., Brizzi, M., Wen, W., & Hsu, L. T. (2024). Subspace-based Adaptive GMM Error Modeling for Fault-Aware Vehicular GNSS Positioning in Urban Canyons. *IEEE Transactions on Intelligent Vehicles*. https://doi.org/10.1109/TIV.2024.3450198
6. **Yan, P.**, Wen, W., & Hsu, L. T. (2024). Integration of Vehicle Dynamic Model and System Identification Model for Extending the Navigation Service Under Sensor Failures. *IEEE Transactions on Intelligent Vehicles*, 9(1), 2236–2248.
7. Luo, X., **Yan, P.***, Yan, R., & Wang, S. (2024). Covariate balancing for high-dimensional samples in controlled experiments. *Journal of the Operational Research Society*, 1–15.
8. **Yan, P.**, Wen, W., Huang, F., & Hsu, L. T. (2024). A Fault Detection Algorithm for LiDAR/IMU Integrated Localization Systems with Non-Gaussian Noises. In *Proceedings of the 2024 International Technical Meeting of The Institute of Navigation* (pp. 561–574). (**Invited Paper**)
9. **Yan, P.**, Zhong, Y., & Hsu, L. T. (2024). Bounding the Heavy-tailed Pseudorange Error by Leveraging Membership Weights Analysis of Gaussian Mixture Model. In *Proceedings of the ION 2024 Pacific PNT Meeting* (pp. 541–555).
10. Zhang, Y., Wen, W., & **Yan, P.** (2024). Safe-assured Learning-based Deep SE(3) Motion Joint Planning and Control for UAV Interactions with Dynamic Environments. In *Proceedings of 27th IEEE International Conference on Intelligent Transportation Systems (ITSC).*
11. **Yan, P.**, Hsu, L. T., & Wen, W. (2023). Extending Navigation Service under Sensor Failures: An Approach by Integrating System Identification and Vehicle Dynamic Model. In *2023 IEEE/ION Position, Location and Navigation Symposium (PLANS)* (pp. 630–636).
12. **Yan, P.**, Hsu, L. T., & Wen, W. (2023). Integration of Vehicle Dynamic Model and System Identified Model for Navigation in Autonomous Mobile Robots. In *Proceedings of the 2023 International Technical Meeting of The Institute of Navigation* (pp. 153–160).
13. Li, X., Li, Z., Jia, T., **Yan, P.**, Wang, D., & Liu, G. (2021). The Sense of Community Revisited in Hankow, China: Combining the Impacts of Perceptual Factors and Built Environment Attributes. *Cities*, 111, 103108.
14. Jia, T., & **Yan, P.** (2020). Predicting Citywide Road Traffic Flow Using Deep Spatiotemporal Neural Networks. *IEEE Transactions on Intelligent Transportation Systems*, 22(5), 3101–3111.

PUBLICATIONS IN PROGRESS (*: Corresponding author)

1. **Yan, P.**, Wang, R., Wen, W., & Hsu, L. T. Fault Detection for Integrity with Non-Gaussian Nominal Errors. Submitted to *IEEE Transactions on Aerospace and Electronic Systems*.
2. Li Z., **Yan, P.***, & Li-Ta Hsu. Cauchy-Gaussian Overbound for Heavy-tailed Distributions. Submitted to *Measurements*.
3. Zhang, Y., Wang, Y., **Yan, P.**, & Wen, W. Learning Safe, Optimal, Real-Time Flight Interaction with Deep Confidence-enhanced Reachability Guarantee. Submitted to *IEEE Intelligent Transportation Systems Transactions*.

PATENTS

1. Jia, T & **Yan, P.** (2020). Self-adaptive compact image segmentation method of vector road network. (China, CN111815636A).
2. Jia, T & **Yan, P.** (2020). Urban road traffic flow prediction method and device based on space-time deep learning mode. (China, CN111009129A).