Zhipeng SHEN

Mobile: (+852)62032640 | Email: zhipeng.shen@connect.polyu.hk | Location: Hong Kong, China

Education

The Hong Kong Polytechnic University, Hong Kong, China Sep. 2022- Present
Department of Aeronautical and Aviation Engineering, Supervisor: Dr. Hailong Huang
PhD Candidate

Beihang University, Beijing, China Sep. 2019- Jul. 2022
School of Automation Science and Electrical Engineering, Supervisor: Prof. Zhang Ren
M.Eng., *Control Engineering*

Northwestern Polytechnical University, Xi'an, China Sep. 2015- Jul. 2019
School of Aeronautics.
B.Eng., *Aircraft Design and Engineering*

Research Interests

- Trajectory optimization and motion planning.
- Guidance and control.
- Optimal control

Academic Papers and Patents

Journal Papers

[1] **Z. Shen**, G. Zhou, H. Huang, C. Huang, Y. Wang and F. -Y. Wang, "Convex Optimization-Based Trajectory Planning for Quadrotors Landing on Aerial Vehicle Carriers," ***IEEE Transactions on Intelligent Vehicles***, vol. 9, no. 1, pp. 138-150, Jan. 2024. **(IF:8.2, Q1)**

[2] **Z. Shen**, J. Yu, X. Dong, Y. Hua, and Z. Ren, "Penetration trajectory optimization for the hypersonic gliding vehicle encountering two interceptors," ***Aerospace Science and Technology***, vol. 121, p. 107363, 2022. **(IF:5.107, Q1)**

[3] H. Huang, **Z. Shen**, C. Huang, Y. Wang and F. -Y. Wang, "Intelligent Vehicle Carriers to Support General Civilian Purposes," ***IEEE Transactions on Intelligent Vehicles***, vol. 8, no. 10, pp. 4292-4295, Oct. 2023. **(IF:8.2, Q1)**

[4] H. Cao, L. Cheng, **Z. Shen**, C. Huang, H. Huang, and F. -Y. Wang, "Detecting and Tracking 6-DoF Motion of Unknown Dynamic Objects in Industrial Environments Using Stereo Visual Sensing," in **IEEE Transactions on Systems, Man, and Cybernetics: Systems**. **(Under Review)**

[5] **Z. Shen**, C. Huang, H. Huang, Y. Wang, F. -Y. Wang, A. Jamalipour, D. T. Pham, L. Vlacic, and A. V. Savkin, "Collaboration between Intelligent Vehicles and Intelligent Vehicle Carriers: From Challenges to Potential Solutions and Applications," in **IEEE Transactions on Systems, Man, and Cybernetics: Systems**. **(Under Review)**

Conference Papers

[1] Z. Shen, C. Huang, H. Huang, Y. Wang, F. -Y. Wang, A. Jamalipour, D. T. Pham, L. Vlacic, and A. V. Savkin, "The Emerging Intelligent Vehicles and Intelligent Vehicle Carriers Collaborative Systems," 2024 35th IEEE Intelligent Vehicles Symposium (IV), 2024. **(Accepted)**

[2] D. Hu, **Z. Shen**, C. Huang, H. Huang, "Enhancing autonomous driving following motion decision-making through model-based policy optimization," International Conference on Electric Vehicle and Vehicle Engineering (CEVVE 2023), 2023, pp. 82-97. **(Best Student Paper)**

[3] **Z. Shen**, S. Zhou, J. Yu, and Hailong Huang, "Neural Network-Accelerated Trajectory Optimization for Launch Vehicle Landing," International Conference on Control Science and Systems Engineering (ICCSSE), 2023.

[4] **Z. Shen**, J. Yu, X. Dong, and Z. Ren, "Deep neural network-based penetration trajectory generation for hypersonic gliding vehicles encountering two interceptors," The 41st Chinese Control Conference (CCC), 2022.

[5] **Z. Shen**, J. Yu, X. Dong, Q. Li, and Z. Ren, "Penetration trajectory optimization of hypersonic gliding vehicles with multiple constraints," The 40th Chinese Control Conference (CCC), 2021, 3633-3638.

[6] S. Zhou, **Z. Shen**, J. Yu, and X. Dong, "Output group formation-tracking control for heterogeneous systems with collision avoidance and connectivity maintenance," The 41st Chinese Control Conference (CCC), 2022.

[7] Z. Shen, G. Zhou, and H. Huang, "Sequential Convex Programming for Time-optimal Quadrotor Waypoint Flight," 2024 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2024. **(Under Review)**

Pending Patents

[1] A multi-constrained penetration trajectory optimization method and system for aircraft **(China National Invention Patent 202110346785.8)**

[2] An aircraft penetration trajectory optimization method and system (**China National Invention Patent 202111240388.9**)

Honors and Awards

Scholarship

- Research Postgraduate Scholarship, The Hong Kong Polytechnic University — Mar. 2022
- Second Prize Scholarship, Beihang University — Nov. 2020

Honors

- Outstanding Intern, China Academy of Space Technology — Jul. 2021
- Outstanding Volunteer, 2020 4th Chinese Conference on Swarm Intelligence and Cooperative Control — Nov. 2020

Awards

- First Prize, Northwestern Polytechnical University Solid Rocket Competition — Mar. 2016

Experience

Internship at China Academy of Space Technology (Beijing Institute of Spacecraft System Engineering) **Jul. 2021**

During the internship, I participated in the approach guidance technology research of on-orbit service spacecraft rendezvous and docking, and finally won the title of **Outstanding Intern**.

- The close approach guidance technology is mainly investigated. The Gaussian pseudospectral method is used for trajectory optimization, and LQR is used to complete the guidance process for Clohessy-Wiltshire (C-W) equations.
- Typical task simulations are completed using Systems Tool Kit (STK). And the guidance error caused by measurement accuracy is analyzed.

Language & Programming Skills

Language: Chinese(native), English(fluent)

Programming and software: MATLAB, Python, C++, STK