Yiqing Li

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General Information

Nationality: China
Birth: 06/23/1994
Degree: PhD in Power Engineering

Skills:
Programming (Python, Matlab, Fortran, Simulink, C, Labview);
Computational Fluid Dynamics (Ansys, Altair HyperWorks, in-home solvers);
High-performance computing (Open MPI); Others (Latex, Linux).

GoogleScholar:
https://scholar.google.com/citations?user=Lvx2U8sAAAAJ&hl=en

Research Topics: Flow control, Optimization, Machine learning, Jets and wakes, Room flow, Airborne diseases

Professional Experience

2025/04 – Now	**Research Fellow** in Fluid Mechanics, Dept of Mechanical Engineering, University College London, London, UK (Supervisor: Prof. Manish Tiwari)
2022/12 – 2023/03	**Visiting Scholar**, Chair of Fluid Dynamics, Technical University of Berlin, Berlin, Germany (Supervisor: Prof. Oliver Paschereit)
2017/09 – 2020/04	**Assistant Engineer**, Shanghai Automotive Wind Tunnel Center, Shanghai, China (Supervisor: Prof. Zhigang Yang)

Education

2020/09 – 2025/03	**Ph.D.** in Power Engineering, School of Mechanical Engineering & Automation, Harbin Institute of Technology, Shenzhen, China (Supervisor: Prof. Bernd Noack)
2017/09 – 2020/04	**M.Sc.** in Power Engineering, School of Mechanical Engineering, Tongji University, Shanghai, China (Supervisor: Prof. Zhigang Yang)
2012/09 – 2016/06	**B.Eng.** in Air conditioning, School of Environmental Science and Technology, Suzhou University of Science and Technology, Suzhou, China

Teaching

2017 – 2020	Teaching Assistant in "Parallelize Computer Clusters with Redhat", Partners for the Advancement of Collaborative Engineering (Pace) Center, Tongji University.

Awards & Honors

2025	Provincial Outstanding Graduates, Hei Longjiang Province, China
2022	National Scholarship, China
2013-2016	Outstanding Graduate & Merit Student & The First-Class Scholarships, Suzhou University of Science and Technology, Suzhou, China

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Research Experience

1. **A programme to prevent aerosol borne respiratory diseases using Artificial Intelligence (participant), UK National Institute for Health Research, 2024.** I contributed to developing an interpretable air-safety decision tool based on artificial intelligence and computational simulations. The tool enables accurate assessment and risk control of aerosol transmission in hospitals through laboratory and clinical validation.
2. **Key Technologies for Urban Low-Altitude Environment Simulation and Dynamic Monitoring Based on Digital Twins (participant), Shenzhen Major Science and Technology Project, 2024.** I contributed to a high-fidelity numerical simulation platform for urban low-altitude building environments, optimization algorithms for constructing reduced-order flow models and selecting critical flow-field sensors.
3. **Automobile drag reduction technology based on distributed sensing-excitation and artificial intelligence (participate), Shenzhen Basic Research Project, 2022.** I contributed to the design of distributed actuation at the rear of a vehicle, the development of machine learning algorithms, and the construction of numerical prototypes. The study demonstrated the excellent performance of boat-tail structures in wake drag reduction, achieving a 20% drag reduction on a simplified vehicle model.
4. **Research on cavity flow control based on active and passive combination of distributed excitation system and machine learning (participate), National Natural Science Foundation of China, 2022.** I contributed to the development of gradient-enriched genetic programming for feedback control. This approach improves the learning efficiency of classical genetic programming by an order of magnitude.
5. **Research on flexible surface and microfluidic controlled jet hybrid enhancement based on machine learning algorithms (participate), Natural Science Foundation of Guangdong Province, 2022.** I developed a machine learning control platform based on high-fidelity numerical simulations and developed deep learning-based active learning algorithms. The study identified bouquet-shaped and double-helix jet structures and, achieving a fourfold improvement in mixing efficiency.
6. **Aerodynamic design and drag reduction of autonomous split-type car (participate), National Natural Science Foundation of China, 2019.** I contribute to the design of track width, wheelbase, ground clearance of a baseline split-type autonomous vehicle, with 10% drag reduction.

Publications

[1] **Li, Y.**, Noack, B.R., Wang, T., Cornejo Maceda, G., Pickering, E. & Tyliszczak, A. (2024). Jet mixing enhancement with Bayesian optimization, deep learning and persistent data topology. J. Fluid Mech., 991, A5. DOI: https://doi.org/10.1017/jfm.2024.525.

[2] Reumschuessel, J.M., **Li, Y. (joint first author)**, Zur Nedden, P., Paschereit, C.O., Noack B.R. (2024). Experimental jet control with Bayesian optimization and persistent data topology. Phys. Fluids, 36 (9): 095164. DOI: https://doi.org/10.1063/5.0217519.

[3] **Li, Y.**, Cui, W., Jia, Q., Li, Q., Yang, Z., Morzynski, M., & Noack, B.R. (2022). Explorative gradient method for active drag reduction of the fluidic pinball and slanted Ahmed body. J. Fluid Mech., 932, A7. DOI: https://doi.org/10.1017/jfm.2021.974.

[4] Blanchard, A.B., Cornejo Maceda, G.Y., Fan, D., **Li Y.**, Zhou, Y., Noack, B. R., & Sapsis, T.P. (2022). Bayesian optimization for active flow control. Acta Mechanica Sinica, 37, 1786–1798. DOI: https://doi.org/10.1007/s10409-021-01149-0.

[5] Cornejo Maceda, G.Y., **Li, Y.**, Lusseyran, F., Morzynski, M., & Noack, B.R. (2021). Stabilization of the fluidic pinball with gradient-enriched machine learning control. J. Fluid Mech., 917, A42. DOI: https://doi.org/10.1017/jfm.2021.301.

[6] Reumschüssel, J.M., von Saldern, J.G., **Li, Y.**, Paschereit, C.O., & Orchini, A. (2021). Gradient-free

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optimization in thermoacoustics: application to a low-order model. J. Eng. Gas Turbines Power, 144(5): 051004. DOI: https://doi.org/10.1115/1.4052087.

[7] Yang, Z., **Li, Y. (corresponding author)**, Cui, W., & Jia, Q. (2019). Effect of driving frequency using synthetic jets on flow control for D-shaped body drag reduction. Journal of Tongji University (Natural Science Edition), 47(z1): 9-13. DOI:CNKI:SUN:TJDZ.0.2019-S1-004.

Conferences

[1] **Li, Y.**, Noack B.R., Wang, T., Cornejo Maceda, G.Y., Pickering, E., Shaqarin, T. & Tyliszczak, A. (2024). Jet flow control with Bayesian optimization enhanced by deep learning. The 26th International Congress for Theoretical and Applied Mechanics (ICTAM 2024), Daegu, Korea.

[2] Kaminski P., **Li Y.**, Wawrzak K., Tyliszczak A. & Noack, B.R. (2024). Machine learning-supported CFD optimization of heat transfer in a pipe with a corrugated wall shape. XXVI Fluid Mechanics Conference. Warsaw, Poland.

[3] **Li, Y.**, Blanchard, A., Pickering, E., Tyliszczak, A., & Noack, B.R. (2023). Bayesian optimization of jet mixing based on large eddy simulations. 16th International Conference on Fluid Control, Measurement and Visualization (FLUCOME2023), Beijing, China.

[4] **Li, Y.**, Yang, Z., Morzynski, M., & Noack, B.R. (2022). Explorative gradient method for high-dimensional actuation parameter spaces. 12th International Symposium on Turbulence and Shear Flow Phenomena (TSFP12), Osaka, Japan.

[5] Li, W., **Li, Y.**, Morzynski, M., Noack, B.R. (2021). Full-state flow field estimation of fluid pinball based on deep neural network. Chinese congress of Theoretical and Applied Mechanics 2021 (CCTAM2021), Chengdu, China.

[6] Xie, S., **Li, Y.**, Deng, N., Morzynski, M., Noack, B.R. (2021). Reinforcement learning of the active flow control of the fluidic pinball. Chinese congress of Theoretical and Applied Mechanics 2021 (CCTAM2021), Chengdu, China.

[7] **Li Y.**, et al. (2021). Explorative gradient method for active drag reduction of a slanted Ahmed body. 4th International Conference in Numerical and Experimental Aerodynamics of Road Vehicles and Trains, Berlin, Germany.

[8] **Li, Y.**, Cui, W., Jia, Q., Li, Q., Yang, Z., Morzynski, M., & Noack, B.R. (2020). Explorative gradient method for active drag reduction of the fluidic pinball and slanted Ahmed body. 73rd Annual Meeting of APS Division of Fluid Dynamics (DFD2020), Chicago, America.

[9] **Li, Y.**, Yang, Z., Morzynski, M., Qiao, Z., Krajnović, S., & Noack, B.R. (2020). Explorative gradient method for multi-actuator flow control. Machine Learning Methods for Prediction and Control of Separation Turbulent Flows, Paris, France.

Referees

Dr. Bernd Rainer Noack, Professor at School of Mechanical Engineering and Automation, Harbin Institute of Technology (Shenzhen), Shenzhen, China

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Dr. Zhigang Yang, Professor at Shanghai Automotive Wind Tunnel Center, Tongji University, Shanghai, China; Chief Designer at Beijing Aeronautic Science and Technology Research Institute, Beijing, China

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