Xingyu Su

Personal Info

Name:	Xingyu Su (苏星宇)
Email:	suxy15tsinghua@gmail.com
	su-xy19@mails.tsinghua.edu.cn
Phone:	+86 18728785954
Website:	https://suxy15.github.io

Education

2022/03-present	**Unveristy of Sydney**, Sydney, NSW, Australia (Remote) Visiting Ph.D. in School of Aerospace Mechanical & Mechatronic Enginnering
2019/09-present	**Tsinghua Unveristy**, Beijing, P.R. China Ph.D. candidate in Center for Combustion Energy
2018/07-2018/08	**Duke Univeristy**, Durham, NC, USA Research intern in Department of Mechanical Engineering and Materials Science
2015/09-2019/07	**Tsinghua Unveristy**, Beijing, P.R. China Undergratuate major in Department of Energy and Power Engineering Undergratuate minor in Computer Technology and Application

Research Experience

2022/02-present	*Subject*:	Uncertainty quantification of sooting flames
	Advisor:	Prof. Assaad Masri, University of Sydney Prof. Matt. Cleary, University of Sydney
	Keyword:	Soot formation; Sensitivity analysis; Uncertainty quantification
2021/09-2022/05	*Subject*:	A pairwise mixing model with kernel constraint
	Advisor:	Prof. Zhuyin Ren, Tsinghua University
	Keyword:	Transported PDF method; DNS; Turbulent combustion
2020/03-2022/01	*Subject*:	Kinetic parameter optimization via Neural ODE
	Advisor:	Prof. Zhuyin Ren, Tsinghua University
	Keyword:	Neural networks; Kinetics mechanism; Parameter optimization
2018/11-2020/05	*Subject*:	Uncertainty analysis in mechanism reduction
	Advisor:	Prof. Zhuyin Ren, Tsinghua University
	Keyword:	Mechanism reduction; Uncertainty quantification; Active subspace
2018/07-2018/08	*Subject*:	Image processsing based droplet sorter
	Advisor:	Prof. Tony Jun Huang, Duke Univeristy
	Keyword:	Real-time image processing; Droplet tracking; Experiment

Publications

1. **X. Su**, M.J. Cleary, H. Zhou, Z. Ren, A.R. Masri. Uncertainty analysis of soot formation in laminar flames simulated with a sectional method, *Combustion and Flame (CNF)*, under review.
2. **X. Su**, J. Wei, E.R. Hawkes, H. Zhou, Z. Ren. A pairwise mixing model with kernel constraint and its appraisal in transported PDF simulations of ethylene flames, *Combustion and Flame (CNF)*, under review.
3. **X. Su**, M.J. Cleary, H. Zhou, Z. Ren, A.R. Masri. Uncertainty analysis of soot formation in a burner stabilized stagnation flame, *Asia-Pacific Conference on Combustion (ASPACC)*, 2023, accepted.

4. M. Zhou, W. Chen, **X. Su**, C.L. Sung, X. Wang, Z. Ren. Data-driven modelling of general fluid density under subcritical and supercritical conditions, *AIAA Journal (AIAAJ)*, 2023, in press, [link].
5. X. Wang, J. Wei, **X. Su**, H. Zhou, Z. Ren. Investigation of reaction-induced subgrid scalar mixing in LES/FDF simulations of turbulent premixed flames, *Physical Review Fluids (PRF)*, 2022, 7(12):124603, [link].
6. J. Wei, **X. Su**, E.R. Hawkes, H. Zhou, Z. Ren. Assessment of critical species for differential mixing in transported PDF simulations of a non-premixed ethylene DNS flame, *Combustion and Flame (CNF)*, 2022, 224:112240, [link].
7. W. Ji, **X. Su**, B. Pang, Y. Li, Z. Ren, S. Deng. SGD-based optimization in modeling combustion kinetics: Case studies in tuning mechanistic and hybrid kinetic models, *Fuel*, 2022, 324:124560, [link].
8. **X. Su**, W. Ji, J. An, Z. Ren, S. Deng C. K. Law. Kinetics parameter optimization of hydrocarbon fuels via neural ordinary differential equations, *Combustion and Flame (CNF)*, under review, [preprint].
9. J. Wei, **X. Su**, X. Wang, H. Zhou, E. R. Hawkes, Z. Ren. A mixing timescale model for differential mixing in transported probability density function simulations of turbulent non-premixed flames, *Physics of Fluids (PoF)*, 2022, 34(6):067122 [link].
10. L. Zhang, **X. Su**, H. Zhou, X. Wang, Z. Ren. Active Control of Multiple Neural Networks for Oscillating Combustion, *AIAA Journal (AIAAJ)*, 2022, 60(6):3821-3833, [link].
11. **X. Su**, W. Ji, L. Zhang, W. Wu, Z. Ren, S. Deng. Neural differential equations for inverse modeling in model combustors, *ASME International Mechanical Engineering Congress & Exposition (IMECE)*, 2021, paper 69657, [link].
12. W. Ji, **X. Su**, B. Pang, S. J. Cassady, A. Ferris, Y. Li, Z. Ren, S. Deng, Arrhenius.jl: A Differentiable Combustion Simulation Package, arXiv:2107.06172, [preprint].
13. N. Wang, Q. Xie, **X. Su**, Z. Ren. Active Subspace Methods for the Analysis and Optimization of Turbulent Combustion, Acta Aeronautica et Astronautica Sinica, 2021, 42:625228 (in Chinese), [paper].
14. **X. Su**, W. Ji, Z.Ren. Uncertainty analysis in mechanism reduction via active subspace and transition state analyses, *Combustion and Flame (CNF)*, 2021, 227:135-146, [link], [code].
15. H. Zhu, P. Zhang, Z. Zhong, J. Xia, J. Rich, J. Mai, **X. Su**, Z. Tian, H. Bachman, J. Rufo, Y. Gu, P. Kang, K. Chakrabarty, T.P. Witelski, T.J. Huang, Acoustohydrodynamic tweezers via spatial arrangement of streaming vortices. *Science Advances*, 2021, 7(2):eabc7885, [link].
16. N. Wang, Q. Xie, **X. Su**, Z. Ren. Quantification of modeling uncertainties in turbulent flames through successive dimension reduction, *Combustion and Flame (CNF)*, 2020, 222:476-489, [link].
17. P. Zhang, W. Wang, H. Fu, J. Rich, **X. Su**, H. Bachman, J. Xia, J. Zhang, S. Zhao, J. Zhou, T.J. Huang. Deterministic droplet coding via acoustofluidics, *Lab on a chip*, 2020, 20(23):4466-4473, [link].
18. P. Zhang, C. Chen, **X. Su**, J. Mai, Y. Gu, Z. Tian, H. Zhu, Z. Zhong, H. Fu, S. Yang, K. Chakrabarty, T.J. Huang. Acoustic streaming vortices enable contactless, digital control of droplets, *Science Advances*, 2020, 6(24):eaba0606, [link].

Work Experience

2017/07-2017/08 Hesai Photonics Technology, work as intern in hardware department

Abilities and Skills

Program:	C / C++ / Python / Fortran / Rust / JavaScript
Software:	Matlab / Fluent / OpenFOAM / Solidworks / AutoCAD
Hardware:	Arduino / Raspberry PI
Language:	Mandarin Chinese / English (IELTS 7.0)

Honors and Awards

2022/12	Best Paper Award of China National Symposium on Combustion, China
2017/11	National First Prize of China Undergraduate Mathematical Contest in Modeling, China
2017/10	Scholarship for Technology Innovation Excellence, Tsinghua University
2017/04	Third Prize of 35th Challenge Cup, Tsinghua University

Extracurricular Activities

2019/07-2020/07 **Club Leader** at Skyworks Club, Tsinghua University

Hobbies

Roller Skating, Skating, Skiing, Swiming