# Xingyu Su

## Personal Info


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## Education

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|---|---|
| 2019/09-present | **Tsinghua Unveristy**, Beijing, P.R. China<br>Ph.D. student in Center for Combustion Energy |
| 2018/07-2018/08 | **Duke Univeristy**, Durham, NC, USA<br>Research intern in Department of Mechanical Engineering and Materials Science |
| 2015/09-2019/07 | **Tsinghua Unveristy**, Beijing, P.R. China<br>Undergratuate major in Department of Energy and Power Engineering<br>Undergratuate minor in Computer Technology and Application |

## Research Experience

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| 2022/02-present | *Subject*: | Uncertainty quantification of sooting flames |
| | *Advisor*: | Prof. Assaad Masri, University of Sydney<br>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**, W. Ji, Q. Xie, Z. Ren, C. K. Law. Kinetics parameter optimization via neural ordinary differential equations, in preparation.
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, 2022, under review.
3. 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, 2022, in press.

4. 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, 2022, in press.
5. 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, [paper].
6. L. Zhang, **X. Su**, H. Zhou, X. Wang, Z. Ren. Active Control of Multiple Neural Networks for Oscillating Combustion, AIAA Journal, 2022, 60(6): 3821-3833, [paper].
7. 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.
8. **X. Su**, W. Ji, L. Zhang, W. Wu, Z. Ren, S. Deng. Neural differential equations for inverse modeling in model combustors,, ASME IMECE, 2021, paper 69657, [paper].
9. 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].
10. **X. Su**, W. Ji, Z.Ren. Uncertainty analysis in mechanism reduction via active subspace and transition state analyses, Combustion and Flame, 2021, 227:135-146, [paper], [code].
11. 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, [paper].
12. N. Wang, Q. Xie, **X. Su**, Z. Ren. Quantification of modeling uncertainties in turbulent flames through successive dimension reduction, Combustion and Flame, 2020, 222:476-489, [paper].
13. 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, [paper].
14. 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, [paper].

## Work Experience

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

## Abilities and Skills

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| Program: | C / C++ / Python / Fortran / Rust / JavaScript |
| Software: | Matlab / Fluent / Solidworks / AutoCAD |
| Hardware: | Arduino / Raspberry PI |

## Honors and Awards

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| 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