

Xinyu Zhao

Curriculum Vitae

August 2017

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DEGREE AWARDED

- 2013 Ph.D. The Pennsylvania State University State College, PA
Department of Mechanical and Nuclear Engineering
with Dr. Daniel C. Haworth
- 2008 M.Sc. Tsinghua University Beijing, China
Department of Thermal Engineering
with Dr. Qiang Yao
- 2006 B.Eng. Tsinghua University Beijing, China
Department of Thermal Engineering

PROFESSIONAL EXPERIENCE

- Feb. 2015 Assistant Professor
– now Department of Mechanical Engineering
University of Connecticut, Storrs, CT
- Jan. 2014 Postdoctoral Research Fellow
– Nov. 2014 Combustion Energy Frontier Research Center
Princeton University, Princeton, NJ
Co-sponsored by Sandia National Laboratories, Livermore, CA
Co-sponsored by Pennsylvania State University, State College, PA
- Jan. 2010 Graduate Research Assistant
– Dec. 2013 Department of Mechanical and Nuclear Engineering
Pennsylvania State University, State College, PA
- Aug. 2008 Graduate Teaching Assistant
– Dec. 2009 Department of Mechanical and Nuclear Engineering
Pennsylvania State University, State College, PA
- Jan. 2006 Graduate Research Assistant
– Jul. 2008 Department of Thermal Engineering
Tsinghua University, Beijing, China

VISITING SCHOLARSHIP

- Jun. 2016 Visiting Scholar
– Jul. 2016 Center for Turbulence Research Summer Program
Stanford University, Palo Alto, CA

RESEARCH GRANTS

- 2016-2018 **Efficient Radiative Heat Transfer Modeling in Large-Scale Combustion Systems**
 Awarding Agency: National Science Foundation
 Investigator: Xinyu Zhao (single PI)
 Award Description: \$175,000
- 2016-2018 **Efficient Radiative Heat Transfer Modeling in Large-Scale Combustion Systems**
 Awarding Agency: National Science Foundation REU-Supplement
 Investigator: Xinyu Zhao (single PI)
 Award Description: \$8,000
- 2016-2017 **Detailed Modeling for Turbulent Fire Simulations.**
 Awarding Agency: FM Global
 Investigator: Xinyu Zhao (single PI)
 Award Description: \$66,977
- 2016-2017 **Large Eddy Simulations of Pulverized Coal Combustion.**
 Awarding Agency: NSF-XSEDE
 Investigator: Xinyu Zhao (single PI)
 Award Description: \$76,172
- 2016-2017 **Direct Temperature Comparison between Experiments and Computations through High-Fidelity Radiation Modeling in Fire.**
 Awarding Agency: Uconn Provost's Research Excellence Program Storrs (REP)
 Investigator: Xinyu Zhao (single PI)
 Award Description: \$25,000
- 2017-2019 **Reduced Kinetic Models with Fuel Sensitivity for Turbulent Combustion Simulations.**
 Awarding Agency: NASA
 Investigator: Xinyu Zhao (Co-PI 50%, lead PI: Dr. Tianfeng Lu at UConn)
 Award Description: \$300,000
- 2017-2019 **A Computational Study of the Lean Blowoff Mechanism for bluff body Stabilized Premixed Flames**
 Awarding Agency: ACS PRF
 Investigator: Xinyu Zhao (single PI)
 Award Description: \$110,000

PROFESSIONAL SERVICES

Member of Committees, Panels and Reviews

- **Panelist** for the National Science Foundation CISE program, 2016 and 2017
- **Abstract Reviewer, presentation Judge** for the annual Graduate Student Post Competition at University of Connecticut in 2016
- **Panelist** for the Graduate Student Career Development Workshop at University of Connecticut in 2015
- **Faculty Judge** for the Demo Day presentation of the senior design programs at University of Connecticut in 2016 and 2017
- **Committee Member** for the department head search committee at Department of Mechanical Engineering, University of Connecticut from 2015 to 2016

- **Committee Chair** of the qualify exam committee for fluid mechanics at Department of Mechanical Engineering, University of Connecticut since 2016
- **Committee Member** of computational committee at Department of Mechanical Engineering, University of Connecticut since 2015
- **Defense Committee Member** for Cong Li (M.S. 2015), Brian Magda (M.S.2016), Hanyu Song (M.S. 2015), Leonard Poplaski (M.S. 2016), Gotham Kukkadapu (Ph. D. 2016), Michael Kuron (Ph. D. 2016), Kyle Brady (Ph. D. 2016), Bikram Roychowdhury (Ph. D. 2017) at University of Connecticut

Journal or Conference Referee

- Combustion and Flame
- Flow, Turbulence and Combustion
- Combustion Science and Technology
- Combustion Theory and Modeling
- International Journal of Hydrogen Energy
- International Journal of Thermal Science
- Fuel Processing Technology
- Proceedings of Combustion Institute
- AIAA Journal
- International Symposium on Fire Safety Science

Organizer and Chairwoman of Symposia

- **Mini-symposium Co-Organizer** 'MS8 and MS10: High-Ka turbulent premixed flames: Physics and Modeling' (together with H. Kolla) for the 17th International Conference on Numerical Combustion, Orlando, FL. April 03-05, 2017
- **Seminar Coordinator** for the ME Seminar Series at University of Connecticut from 2015 to 2016
- **Session Chair** for US National Combustion Meeting, College Park, MD, April 20-23, 2017
- **Session Chair** for Eastern States Section of the Combustion Institute, Spring Technical Meeting, Princeton, NJ, April 20-23, 2016
- **Session Chair** for the 68th American Physical Society Division of Fluid Dynamics Conference, Boston, MA, November 20-22, 2015

Others

- **Lab tour presenter** for the Women in Engineering Day at University of Connecticut, 2016
- **Booth Presenter** at the School of Engineering Open House at University of Connecticut, 2015

SUPERVISING

2017 - now	Hasret Turkeri	Postdoctoral scholar
2015 - now	Bifen Wu	Doctoral student
2015 - now	Alexandros Mathioudakis	Doctoral student (co-advising after May 2016)
2017 - now	Peiyu Zhang	Doctoral student
2016- now	Andrew Caratenuto	Undergraduate research assistant
2016	Justin DeLarm	Undergraduate SURF awardee
2017 - now	Joeshua Ligutom	Undergraduate student
2015 - 2017	Senior design	2015-2016 (Team 1), 2016-2017 (Team 20)

HONORS AND AWARDS

- 2016 Teaching Excellence Recognition by Office of the Provost, UConn ME3275 (Undergraduate) and ME5311 (Graduate)
- 2014 Princeton University Combustion Energy Research Fellowship
- 2013 Travel Awards to present at the SIAM numerical combustion conference, San Antonio, TX
- 2007 Tsinghua-Guanghua Excellent Student Scholarship for Academic Distinction
- 2004 Tsinghua University Excellent Student Leader
- 2004 Thermal Engineering Student Scholarship for Academic Distinction
- 2003 Tsinghua-CNPC Student Scholarship for Academic Distinction

PUBLICATIONS

Refereed research papers

1. **Zhao, Xinyu**, X. Zhao, and Q. Yao (2007). The modeling of direct carbon fuel cells with solid oxide electrolytes. *Journal of Engineering Thermophysics* (Suppl. 2), 161–164.
2. **Zhao, Xinyu**, Q. Yao, S. Li, and N. Cai (2008). Studies on the carbon reactions in the anode of deposited carbon fuel cells. *Journal of Power Sources* **185**(1), 104–111.
3. **Zhao, Xinyu**, D. C. Haworth, and E. D. Huckaby (2012). Transported PDF modeling of non-premixed turbulent CO/H₂/N₂ Jet Flames. *Combustion Science and Technology* **184**(5), 676–693.
4. **Zhao, Xinyu**, D. C. Haworth, T. Ren, and M. F. Modest (2013). A transported probability density function photon Monte Carlo method for high-temperature oxy-natural gas combustion with spectral gas and wall radiation. *Combustion Theory and Modelling* **17**(2), 354–381.
5. **Zhao, Xinyu** and D. C. Haworth (2014). Transported PDF modeling of pulverized coal jet flames. *Combustion and Flame* **161**(7), 1866–1882.
6. Jangi, M., **Zhao, Xinyu**, D. C. Haworth, and X.-S. Bai (2015). Stabilization and liftoff length of a non-premixed methane/air jet flame discharging into a high-temperature environment: An accelerated transported PDF method. *Combustion and Flame* **162**(2), 408–419.
7. Kolla, H., **Zhao, Xinyu**, J. H. Chen, and N. Swaminathan (2016). Velocity and reactive scalar dissipation spectra in turbulent premixed flames. *Combustion Science and Technology* (9), 1424–1439.
8. **Zhao, Xinyu**, A. Bhagatwala, J. H. Chen, D. C. Haworth, and S. B. Pope (2016). An *a priori* DNS study of the shadow-position mixing model. *Combustion and Flame* **165**, 223–245.
9. Wu, B., S. Roy, **Zhao, Xinyu**, and M. Modest (2017). Effect of multiphase radiation on coal combustion in a pulverized coal jet flame. *Journal of Quantitative Spectroscopy and Radiative Transfer*. <https://doi.org/10.1016/j.jqsrt.2017.03.017>.

Papers in conference proceedings

1. **Zhao, Xinyu** and Haworth, Dan and Gupta, Ankur (2011). PDF-based modeling of nonpremixed turbulent CO/H₂/N₂ flames. In: *7th U. S. National Combustion Meeting*. poster presentation. Atlanta, GA.
2. **Zhao, Xinyu**, D. C. Haworth, and E. D. Huckaby (2011). Transported PDF modeling of non-premixed turbulent syngas flames and 0.8 MW oxy-natural gas furnace. In: *Eastern States Section of the Combustion Institute Fall Technical Meeting*. Storrs, CT.
3. Woodside, C. R., Richards, G., Huckaby, E. D., Marzouk, O. A., Haworth, D. C., Celik, I. B., Ochs, T., Oryshchyn, D., Strakey, P. A., Casleton, K. H., Pepper, J., Escobar-Vargas, J., **Zhao, Xinyu** (2012). Direct power extraction with oxy-combustion: An overview of magnetohydrodynamic research activities at the NETL-Regional University Alliance (RUA) Authors. In: *29th Annual International Pittsburgh Coal Conference*. Pittsburgh, PA.
4. **Zhao, Xinyu** and Haworth, Dan (2013). Transported PDF modeling of a pulverized coal jet flame. In: *14th SIAM International Conference on Numerical Combustion*. San Antonio, TX.
5. **Zhao, Xinyu** and D. C. Haworth (2013). Transported PDF modeling for pulverized coal combustion. In: *Bulletin of the American Physical Society*. Pittsburgh, PA.

6. **Zhao, Xinyu** and D. C. Haworth (2013). Transported PDF modeling of a pulverized coal jet flame. In: *8th National Combustion Meeting*. Park City, UT.
7. **Zhao, Xinyu**, A. Bhagatwala, J. Chen, D. Haworth, and S. B. Pope (2014). *A priori* DNS evaluation of the shadow-position mixing model in turbulent reactive flows. In: *Bulletin of the American Physical Society*. San Francisco, CA.
8. **Zhao, Xinyu**, A. Bhagatwala, A. M. Steinberg, and J. H. Chen (2014). Principal strain-rate transport in turbulent non-premixed DME flames: a comparative study using DNS and tomographic particle image velocimetry. In: *12th Turbulent Nonpremixed Flame Workshop*. poster presentation. Pleasanton, CA.
9. Cai, J., **Zhao, Xinyu**, M. F. Modest, and D. C. Haworth (2015). Nongray radiation modelings in Eulerian-Lagrangian methods for pulverized coal flames. In: *1st Thermal and Fluids Engineering Summer Conference: Paper No. TFESC-12950*. New York, NY.
10. **Zhao, Xinyu** and Bhagatwala, Ankit and Chen, Jacqueline and Haworth, Daniel C. and Pope, Stephen B. (2015). *A priori* DNS study of the shadow position mixing model. In: *9th U. S. National Combustion Meeting*. Cincinnati, OH.
11. **Zhao, Xinyu** and A. Mathioudakis (2015). DNS evaluation of Reynolds stress models and generalized Langevin models using velocity-acceleration correlation. In: *Bulletin of the American Physical Society*. Boston, MA.
12. Mathioudakis, A. and **Zhao, Xinyu** (2016). *A priori* evaluation of the generalized Langevin models under the influence of flames. In: *Eastern States Section of the Combustion Institute Spring Technical Meeting*. Princeton, NJ.
13. Roy, S., B. Wu, M. Modest, and **Zhao, Xinyu** (2016). Monte Carlo modeling of radiative transfer in a pulverized coal jet flame. In: *Bulletin of the American Physical Society*. Portland, OR.
14. Wang, Q., **Zhao, Xinyu**, L. Esclapez, P. Govindaraju, and M. Ihme (2016). Evaluation of subgrid dispersion models for LES of spray flames. In: *Bulletin of the American Physical Society*. Portland, OR.
15. Wu, B., S. P. Roy, **Zhao, Xinyu**, and M. F. Modest (2016). A computational study of radiative heat transfer in pulverized coal jet flame. In: *Eastern States Section of the Combustion Institute Spring Technical Meeting*. Princeton, NJ.
16. Wu, B., S. Roy, M. F. Modest, and **Zhao, Xinyu** (2016). Monte Carlo modeling of radiative transfer in a pulverized coal jet flame. In: *Proceedings of the 8th International Symposium on Radiative transfer, RAD-16*. Cappadocia, Turkey.
17. Wu, B., **Zhao, Xinyu**, X. Chao, T. Lu, and J. Chen (2016). Real fuel effects on flame extinction and re-ignition. In: *Bulletin of the American Physical Society*. Portland, OR.
18. Turkeri, Hasret and **Zhao, Xinyu** and Kolla, Hemanth (2017). Scalar gradient statistics for regime independent modeling. In: *16th SIAM International Conference on Numerical Combustion*. Orlando, FL.
19. Wu, Bifen and **Zhao, Xinyu** and Choudhury, Bikram R. and Cetegen, Baki (2017). Large eddy simulations of a bluff-body stabilized flame. In: *16th SIAM International Conference on Numerical Combustion*. Orlando, FL.
20. Wu, B. and **Zhao, Xinyu** (2017). Radiation characteristics of fire-inspired heterogeneous mixtures: a Monte Carlo ray tracing study. In: *10th U. S. National Combustion Meeting*. College Park, MD.

INVITED TALKS

- June 2017 High fidelity modeling for reactive-diffusion systems.
Beacon Fire Series Seminar, Tsinghua University, Beijing, China.
- May 2017 Radiative heat transfer under engine-relevant conditions:
high-fidelity and reduced-order modeling.
at United Technology Research Center, East Hartford, CT.
- May 2017 The radiative interactions between nongrey gas, soot,
water mist and turbulence: a Monte Carlo ray tracing study.
at 9th FM Global Open Source CFD Fire Modeling Workshop. Norwood, Ma.
- Nov. 2016 Computational Combustion: Challenges and Opportunities.
at Pi Tau Sigma General Meeting. University of Connecticut, CT.
- Oct. 2016 Computational Thermal Fluids: Challenges and Opportunities.
at AIAA Student Chapter Meeting. University of Connecticut, CT.
- May 2016 Monte Carlo Ray Tracing for Fire Radiation Modeling.
at 8th FM Global Open Source CFD Fire Modeling Workshop. Norwood, Ma.
- Nov. 2015 Turbulence Modeling in Reactive Flows.
at 1st Applied Mechanics Symposium. University of Connecticut, CT.
- Apr. 2015 Transported Probability Density Function Modeling of Pulverized Coal Combustion.
at 15th International Conference on Numerical Combustion. Avignon, France.

PROFESSIONAL SOCIETIES

- Since 2010 The Combustion Institute
- Since 2013 American Physical Society
- Since 2013 Society for Industrial and Applied Mathematics
- Since 2016 The American Institute of Aeronautics and Astronautics