

Haowei Wang

Professor
Department of Mechanical Engineering
California State University Fullerton
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Education

Ph.D., Mechanical Engineering, Rensselaer Polytechnic Institute, Troy, NY, 2012
M.S., Mechanical Engineering, Rensselaer Polytechnic Institute, Troy, NY, 2009
B.Eng., Thermal Energy and Power Engineering, Southeast University, Nanjing, China, 2008

Professional Experience

Professor, Department of Mechanical Engineering
California State University Fullerton, Fullerton, CA 8/2022-Present

Associate Professor, Department of Mechanical Engineering
California State University Fullerton, Fullerton, CA 8/2017-8/2022

Assistant Professor, Department of Mechanical Engineering
California State University Fullerton, Fullerton, CA 8/2012-8/2017

Research and Development Intern, Combustion Laboratory
General Electric Global Research Center, Niskayuna, NY 5/2010-8/2010

- Designed, prepared, and conducted tests for two gasifier combustor design projects. Worked closely with engineers, technicians, and vendors located worldwide to design, test, and improve gasifier nozzles.
- Set up optics and beam light for image capture. Wrote codes to process high-speed camera images of gasifier flows to optimize image quality for data extraction. Studied the fluid dynamics, formulated and organized results, performed analysis, and made recommendations for the commercialization of gasifier technology for stationary power generation.

Graduate Research Assistant, Advisor: Matt Oehlschlaeger
Rensselaer Polytechnic Institute, Troy, NY 8/2008-5/2012

- Developed experimental facilities (shock tube) and techniques for the measurement of autoignition delay times for heavy low vapor pressure hydrocarbon compounds and jet fuels. Set up data acquisition system. Simulation with Chemkin.
- Investigated the oxidation and ignition of individual hydrocarbon compounds, fuel surrogate mixtures, and traditional and alternative transportation fuels. Focused primarily on biodiesel, jet fuels (Jet-A (commercial), JP-8 (U.S. Military), alternative Fischer-Tropsch synthetic jet fuels)

and jet fuel surrogates to aid in the development and validation of fuel chemical kinetic models used in engine development and design.

- Research funded by United States Air Force Office of Scientific Research.

Undergraduate Researcher, Department of Thermal Energy and Power Engineering

Southeast University, Nanjing, China

2006-2008

- Experiments and CFD modeling of the fundamentals of gas-solid two-phase flows for fluidized bed applications in clean energy technology. Fluidized bed reactor design using 3D CAD and fluid simulation using FLUENT with Gambit mesh generation; results published in journal and in B.Eng. thesis.
- Assessment of the technical and economic feasibility of CO₂ Capture and Sequestration as part of a climate change study; literature review, modeling, and data analysis of CO₂ emissions from different coal sources found in China.

Teaching

California State University Fullerton

- **Digital Computation**, EGME 205: Freshman level requirement for mechanical engineering majors. Focus is on computer programming with Matlab of importance to engineers. Arrays, operation, loops, regression, application in mathematics.
- **Thermodynamics**, EGME 304: Junior level requirement for mechanical engineering majors. This course covers fundamental energy relationships, thermodynamic properties, first and second laws of thermodynamics and power generation.
- **Fluids & Thermal Laboratory**, EGME 306B: Experimental studies of fluid friction and heat exchanger performance. Use of computers in data acquisition, reduction and analysis.
- **Fluid Mechanics**, EGME 333: Junior level requirement for mechanical engineering majors. Focus is on fluid properties, hydrostatic forces, conservation of mass, energy and momentum, Bernoulli Equation and Navier-Stokes equation, boundary layer and fluid flow in pipes and ducts.
- **Heat Transfer**, EGME 407: Junior and senior level requirement for mechanical engineering majors. This course covers conduction heat transfer, convection heat transfer, radiation heat transfer and heat exchangers.
- **Combustion**, EGME 434: Introduction to flame propagation, explosions, detonations, and droplet combustion. Discussion of internal and external combustion engines.
- **Propulsion Systems**, EGME 435: Fundamental concepts from thermodynamics and fluid mechanics to predict the general performance characteristics of propulsion systems used in aircraft and spacecraft.
- **Computer Application in Engineering Design**, EGME 540: Using ANSYS to design and optimize the design of various mechanical engineering problems in structure, heat transfer, fluid mechanics and dynamics.

Rensselaer Polytechnic Institute

- Teaching Assistant for Modeling and Analysis of Uncertainty (Fall 2008): conducted both group and one-on-one student instruction on probability and statistics and the application of the software Minitab.
- Teaching Assistant for Heat Transfer (Fall 2008): Led office hour sessions to help students with assignments and the software COMSOL.
- Teaching Assistant for Combustion (Spring 2010): Graded quizzes, homework and exams and held office hours.
- Teaching Assistant for Propulsion Systems (Fall 2011): Graded homework and exams and guest lectured.

Research Interests

Heat Transfer, Energy, Combustion, Alternative Fuels, Engineering Education.

Refereed Journal Publications

1. Guitao Zhang, Kangjun Lu, Yifan Wang, **Haowei Wang**, Qian Chen, “Mechanical and electronic properties of α - M_2X_3 (M =Ga, In; X =S, Se) monolayers”, Phys. Rev. B 105, 235303 (2022)
2. **Haowei Wang**, Matthew A. Oehlschlaeger, “Shock tube ignition delay time measurements for methyl propanoate and methyl acrylate: influence of saturation on small methyl ester high-temperature reactivity”, International Journal of Chemical Kinetics, 1-11 (2020)
3. **Haowei Wang**, Hope Weiss, Chean Chin Ngo, Sang June Oh, “A Comparison of Student Performance and Confidence between a Traditional and Hybrid Thermodynamics Class”, International Journal of Engineering Sciences & Management Research, 7(3), 1-7 (2020).
4. Yitian Wang, Chenghuan Jiang, Qian Chen, Qionghua Zhou, **Haowei Wang**, Jianguo Wan, Liang Ma, Jinlan Wang, “Highly Promoted Carrier Mobility and Intrinsic Stability by Rolling Up Monolayer Black Phosphorus into Nanoscrolls”, The Journal of Physical Chemistry Letters, 9, (2018).
5. Chenghuan Jiang, Yitian Wang, Yehui Zhang, **Haowei Wang**, Qian Chen, Jianguo Wan, “Robust Half-Metallic Magnetism in Two-Dimensional Fe/MoS₂”, The Journal of Physical Chemistry C, 122(37), (2018).
6. Chenghua Jiang, Yitian Wang, Rongqing Zhou, **Haowei Wang**, Qian Chen, “Air Molecules in $XPbI_3$ (X =MA, FA, Cs) Perovskite: A Degradation Mechanism Based on First-principles Calculations”, Journal of Applied Physics, 124(8), (2018).

7. Daniel Argueta*, **Haowei Wang**, "Effects of Biodiesel on Engine Performance and Tailpipe Characteristics", *International Journal of Engineering Sciences and Management*, 7(2), 1-9 (2017) (*CSUF Student).
8. Christopher W. LaMorte*, **Haowei Wang**, "Utilizing Laser Cutting, 3D Printing and 3D Scanning to Create an Affordable Fully Interactive Prototype of a Full Size Animatronic Figure", *Journal of Engineering and Architecture*, 3(1), 1-9 (2015) (*CSUF Student).
9. S.H. Won, S. Dooley, P.S. Veloo, **H. Wang**, M.A. Oehlschlaeger, F.L. Dryer, Y. Ju, "The Combustion Properties of 2,6,10-Trimethyl Dodecane and a Chemical Functional Group Analysis," *Combustion and Flame*, 161, 826-834 (2014).
10. **H. Wang**, W. J. Gerken, W. Wang, and M.A. Oehlschlaeger, "Experimental Study of the High-Temperature Autoignition of Tetralin," *Energy & Fuels*, 27, 5483-5487 (2013).
11. M.A. Oehlschlaeger, **H. Wang** and M.N. Sexton, "Prospects for Biofuels: A Review," *Journal of Thermal Science and Engineering Applications*, 5(2), (2013).
12. **H. Wang** and M.A. Oehlschlaeger, "Autoignition Studies of Conventional and Fischer-Tropsch Jet Fuels," *Fuel*, 98, 249-258 (2012).
13. S. Dooley, S.H. Won, J. Heyne, T.I. Farouk, Y. Ju, F.L. Dryer, K. Kumar, C.J. Sung, **H. Wang**, M.A. Oehlschlaeger, V. Iyer, T.A. Litzinger, R.J. Santoro, T. Malewicki, K. Brezinsky, "The Experimental Evaluation of a Methodology for Surrogate Fuel Formulation to Emulate Gas Phase Combustion Kinetic Phenomena," *Combustion and Flame*, 159, 1444-1466 (2012).
14. S. Dooley, S.H. Won, S. Jahangirian, Y. Ju, F.L. Dryer, **H. Wang**, M.A. Oehlschlaeger, "The Combustion Kinetics of A Synthetic Paraffinic Jet Aviation Fuel and a Fundamentally Formulated, Experimentally Validated Surrogate Fuel," *Combustion and Flame*, 159, 3014-3020 (2012).
15. S.M. Sarathy, C.K. Westbrook, M. Mehl, W.J. Pitz, C. Togbe, P. Dagaut, **H. Wang**, M.A. Oehlschlaeger, U. Niemann, D. Seshadri, P.S. Vello, C. Ji, F.N. Egolfopoulos, T. Lu "Comprehensive Chemical Kinetic Modeling of the Oxidation of 2-Methylalkanes from C₇ to C₂₀," *Combustion and Flame*, 158, 2338-2357 (2011).
16. S. Dooley, S.H. Won, M. Chaos, J. Heyne, Y. Ju, F.L. Dryer, K. Kumar, C.J. Sung, **H. Wang**, M.A. Oehlschlaeger, R.J. Santoro, and T.A. Litzinger, "A Jet Fuel Surrogate Formulated by Real Fuel Properties," *Combustion and Flame*, 157, 2333-2339 (2010).
17. **H. Wang**, S.J. Warner, M.A. Oehlschlaeger, R. Bounaceur, P.A. Glaude, and F. Battin-Leclerc, "An Experimental and Kinetic Modeling Study of the Autoignition of α -

Methylnaphthalene/Air and α -Methylnaphthalene/n-Decane/Air Mixtures at Elevated Pressures,” *Combustion and Flame*, 157, 1976-1988 (2010).

18. **H. Wang**, Y. Zhu, Z. Zhong, and B. Jin, “Three-Dimensional Numerical Simulation of Gas-Solid Injector,” *Energy Research and Utilization*, 1, 17-21 (2008).

Refereed Conference Articles

1. Raul Perez*, Pablo Vazquez*, Joseph Piacenza, **Haowei Wang**. Performance Analysis of Different Carbon Fiber Application Methods on a Sounding Rocket under Certain Drag Conditions. Poster. SCCUR Research Symposium, Claremont, CA (2015) (* CSUF Students)
2. Christopher W. LaMorte*, **H. Wang**, Utilizing Laser Cutting, 3D Printing and 3D Scanning to Create an Affordable Fully Interactive Prototype of Full Size Animatronic Figure, International Conference on Sustainable Materials Science and Technology, Paris, France, (2015) (* CSUF Students)
3. **H. Wang**, Effects of Biodiesel on Engine Performance and Emissions, Council on Undergraduate Research Conference, poster session, Washington, DC, (2014)
4. A. Quilala*, H. Zazueta*, V. Gonzalez*, **H. Wang**, Experimental Study of the Effects of Biodiesel on Engine Performance and Emissions, Spring Meeting of Western States Section of the Combustion Institute, Pasadena, CA, (2014) (* CSUF Students)
5. S.H. Won, S. Dooley, P.S. Veloo, **H. Wang**, M.A. Oehlschlaeger, F.L. Dryer, Y. Ju, Quantification of Molecule Structure Impact on Combustion Properties for Synthetic Diesel Fuel: 2,6,10-Trimethyldodecane, 8th US National Technical Meeting of the Combustion Institute, Salt Lake City, UT, (2013)
6. S. Dooley, S.H. Won, S. Jahangirian, Y. Ju, F.L. Dryer, **H. Wang**, M.A. Oehlschlaeger, An Experimentally Validated Surrogate Fuel for the Combustion Kinetics of S-8, a Synthetic Paraffinic Jet Aviation Fuel, AIAA 2012-619, 50th AIAA Aerospace Sciences Meeting, Nashville, TN, (2012)
7. **H. Wang**, M.A. Oehlschlaeger, S. Dooley, F.L. Dryer, A Shock Tube and Kinetic Modeling Study of the Autoignition of n-Propylbenzene, 7th US National Technical Meeting of the Combustion Institute, Atlanta, GA, (2011)
8. S.M. Sarathy, C.K. Westbrook, M. Mehl, W.J. Pitz, C. Togbe, P. Dagaut, **H. Wang**, M.A. Oehlschlaeger, U. Niemann, K. Seshadri, P.S. Veloo, C. Ji, F. Egolfopoulos, T. Lu, Comprehensive Chemical Kinetic Modeling of the Oxidation of C₈ and larger n-alkanes and 2-methylalkanes, 7th US National Technical Meeting of the Combustion Institute, Atlanta, GA, (2011)

9. S. Dooley, S.H. Won, J. Heyne, Y. Ju, F.L. Dryer, K.I. Kumar, C.J. Sung, **H. Wang**, M.A. Oehlschlaeger, T.A. Litzinger, R.J. Santoro, The Formulation of Surrogate Fuels to Emulate the Combustion Behavior of Real Jet Aviation Fuels, 7th US National Technical Meeting of the Combustion Institute, Atlanta, GA, (2011)
10. S. Dooley, S.H. Won, M. Chaos, J. Heyne, Y. Ju, F.L. Dryer, K. Kumar, C.J. Sung, **H. Wang**, M.A. Oehlschlaeger, R.J. Santoro, and T.A. Litzinger, A Jet Fuel Surrogate Formulated by Real Fuel Properties, *Western States Meeting of the Combustion Institute*, Boulder, CO (2010).

Funding

Awarded External Grants

1. 2024 NASA MUREP MIRO Program
Title: Spacelgnite Center for Advanced Research-Education in Combustion (SPARC Center)
PI. Awarded. Amount: \$4,999,999
2. 2017-18 Course Redesign with Technology Award, CSU Office of the Chancellor.
PI. Awarded. Amount: \$10,948
3. 2016 GFO-16-506 Off-Road Heavy-Duty Natural Gas Vehicle Research and Development Program, California Energy Commission
Title: Research, Development and Demonstration of Low-Emission CNG Engines for Construction Vehicles.
Co-PI in collaboration with Michael Naylor, Olson-Ecologic Engine Testing Laboratories.
Awarded. Amount: \$1.5 Million (\$72,491 allocated to CSUF)
4. 2014 Energy Innovations Small Grant Transportation Program, California Energy Commission
Title: Exhaust Gas Heat Exchanger Model for Mobile ICEs.
Co-PI in collaboration with John Stewart, Cliff Edge Consulting.
Awarded. Amount: \$79,329 (\$54,400 allocated to CSUF)

Awarded Internal Grants

5. 2020-21 Innovation Grant, CSUF
Title: Understanding the Triple Opportunity Male Equity Gap using Long-Form Interviews.
CO-PI. Amount: \$9892
6. 2015-16 Research, Scholarship, and Creative Activity (RSCA) Incentive Award, CSUF
Title: Design of Exhaust Gas Heat Exchanger to Enable Waste Heat Recovery for Mobile Internal Combustion Engines
PI. Awarded. Amount: \$10,000
7. 2014 Faculty Enhancement and Instructional Development Grant, CSUF
Title: Development of a Combustion Systems Course for Mechanical Engineering Majors with 'Hands-on' Lab Experiments.
PI. Awarded. Amount: 3 WTUs Release time + \$500
8. 2013-14 Junior/Senior Intramural Research Grant, CSUF
Title: Effects of Biodiesel and Ethanol on the Performance and Emissions of a Diesel Engine
PI. Awarded. Amount: 3 WTUs Release time + \$1999

Student Research Supervision

Graduate Students

1. Roger Duran Flores, M.S. Project Advisor, 2024
2. Mariah Theologidy, M.S. Project Advisor 2023
3. Hussein Ryan Dagher, M.S. Project Advisor, 2019-2020
4. Duke Le, M.S. Project Advisor, 2019-2020
5. Anh Nguyen, M.S. Project Advisor, 2016-2017
6. Irving Martinez, M.S. Project Advisor, 2016-2017
7. Jonathan Nguyen, M.S. Project Advisor, 2015-2017
8. Elya Assourian, M.S. Project Advisor, 2014-2016
Topic: Effects of Biodiesel on the Performance of a Diesel Engine and Emissions.
9. Christopher LaMorte, M.S. Project Advisor, 2014-2015
Topic: Design and Constructing a Full-Size Animatronic German Shepherd Dog by: Utilizing Laser Cutting, 3D Printing and 3D Scanning to Create a Fully Interactive Affordable Prototype
10. Ace Quilala, M.S. Project Advisor, 2013-2014

Undergraduate Students

11. Adrian Iniguez, 2014-2016
Funded by LSAMP (Louis Stokes Alliance for Minority Participation) Program.
12. Rafael Teran, 2014-2015
Funded by LSAMP (Louis Stokes Alliance for Minority Participation) Program.
13. Hector Zezueta, 2013-2014
Funded by LSAMP (Louis Stokes Alliance for Minority Participation) Program. Outstanding Research in STEM Award from LSAMP
14. Valeria Gonzalez, Community College Student From Cypress College, Summer 2013
Funded by NSF (STEM)² Program
15. Michael Salas, Summer 2013
16. Jordan Tran, Summer 2013

Service

Department and College Service

Dean's Faculty Fellow	2019-Present
CSU Certificate Program Student Success Analytics –	
Official Team Member for ECS,	8/2019-12/2019
Campus-wide Assessment Liaison for ECS	8/2019-Present
Department Personnel Committee	2017-2018, 2019-2020
Undergraduate Advisor	3/2016-12/2017
Faculty Search Committee Chair	2015-2016
Faculty Search Committee	2013-2018, 2019-2020
Continuous Improvement Committee	2013-2014
Undergraduate Program Committee	2017-2018, 2019-2020
Master's Students Exam Committee	2012-Present

ABET Course Coordinator for EGME 333 and EGME 407	3/2013-8/2014
ABET Co-Coordinator	1/2020-8/2020
Department Website Representative	8/2015-Present
ECS College Career Specialist Search Committee	9/2019-Present
Master Thesis/Project Committee Member	9/2012-Present
Advisor for TITAN Rocket Engineering Society on campus	2015-2018
3 rd place in 2016 senior design,	
1 st place in 2016 MAC Short Engineering Design Competition – SAE Southern California Section	

Campus Wide Service

University Commencement Committee	8/2021-5/2022
University Campaign Congress	Spring 2020 - Present
ECS Dean Search Committee	Spring 2018
Fall 2019 WASC Visit and Preparation subcommittee - Faculty and Staff	Spring 2017 -Fall 2019

Evaluator for BOLD Women's Leadership program	Spring 2017
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Committee member of campus-wide Phase 3 of EPOCHS Faculty/Student Mentoring Program
(Enhancing Postbaccalaureate Opportunities at CSUF for Hispanic Students) 9/2012-4/2013

Professional Community Service – Research Paper and Proposal Reviewing

SAE International Journal of Fuels and Lubricants (2020)
 Fuel (2017, 2013, 2012)
 Council on Undergraduate Research (2013, 2014)
 Energy and Fuel (2013, 2014)
 ASME Journal of Thermal Science and Engineering Applications (2013-2019)
 International Mechanical Engineering Congress & Exposition Conference (2013, 2014)
 ASME Heat Transfer Conference (2013)
 Recent Patents on Mechanical Engineering (2011)
 Recent Patents on Chemical Engineering (2011)
 American Chemical Society, Petroleum Research Fund (2013)
 Faculty Enhancement and Instructional Development Proposals (2015)
 European Research Council (2015)

Professional Community Service – Conference Chairing

Chair of the Laminar Flames session at the Spring Meeting of Western States Section of the Combustion Institute, Pasadena, CA, (2014)

Community Outreach

Instructor of Engineering Innovation - A summer program for high school students offered by Johns Hopkins University and CSUF Partnership.	7/2013
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Professional Society Membership

American Society of Mechanical Engineers (2012-present), member
Combustion Institute (2012-present), member

Honors

Faculty Advisor of Distinction, CSUF 2018
Extraordinary and Sustained Service Award, CSUF, 2017
Faculty Scholarly and Creative Activity Award, CSUF, 2015