

# Curriculum Vitae

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# Curriculum vitae

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## RESEARCH INTEREST

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Computational and data-enabled science and engineering (CDS&E) and its applications in multiphysics and multiscale systems engineering, including thermal and fluid, energy, aeroservoelasticity, autonomous vehicle/systems, biomedical, and others.

- Physics-based adaptive modeling, from high-fidelity multiphysics CFD/FEM analysis to reduced order modeling and closed-form modeling for real-time simulation, trade space exploration, and process control
- Data-driven multi-fidelity surrogate modeling for multidisciplinary analysis and optimization, large-scale system-level simulation, adaptive model integration, etc.
- Massive and real-time data analytics, discovery, and management, including engineering data mining, parameter estimation, uncertainty quantification, machine learning, and green computing & visualization
- Cyberphysical systems, including model development, AI, system design, control synthesis, hardware development, and experimentation with the long-term goal towards autonomous systems and engineering intelligence

## EDUCATION

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**Ph.D.**, Mechanical Engineering, **Carnegie Mellon University**, *U.S.A.*, Dec. 2005

**M.S.**, Refrigeration and Cryogenics, **Shanghai Jiao Tong University**, *China*, Dec. 2000

**B.S.**, Refrigeration and Cryogenics, **Shanghai Jiao Tong University**, *China*, Jul. 1998

## EMPLOYMENT HISTORY

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<b>University of South Carolina</b>	Columbia, South Carolina
Department of Mechanical Engineering	
<b>Professor</b>	Jan. 2024 – Present
<b>Associate Professor</b>	Aug. 2017 – Dec. 2023
<b>CFD Research Corporation</b>	Huntsville, Alabama
<b>Director</b>	Aug. 2014 – Aug. 2017
<b>Manager</b>	Dec. 2011 – Aug. 2014
<b>Group Leader</b>	Dec. 2009 – Dec. 2011
<b>Senior Engineer</b>	Dec. 2007 – Dec. 2009
<b>Engineer</b>	Oct. 2005 – Dec. 2007

## HONORS AND AWARDS

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- **2021 Breakthrough Stars** Award of University of South Carolina, Jan. 2021.
- **AIAA Senior Member**, Mar. 2022.

- **Associate Editor** of SN Applied Sciences (**Springer Nature**), Jan. 2023.
- **Editorial Board Member** of SN Applied Sciences (**Springer Nature**), Sept. 2022.
- **Topical Advisory Panel Members** of Aerospace journal (MDPI), 2021.
- Chair for Track 5: Advances in Aerospace Technology (co-organizing 19 topics), International Mechanical Engineering Congress and Exposition (IMECE), ASME, 2023-Present
- Co-chair for Track 5: Advances in Aerospace Technology (co-organizing 17 topics), International Mechanical Engineering Congress and Exposition (IMECE), ASME, 2022-2023
- **Technical Committee (TC) Member** of Structures and Materials, Aerospace Division, ASME, 2019- Present.
- **Technical Committee (TC) Member** of Non-deterministic Approaches, AIAA, 2023- Present.
- First author recipient of "**Best Paper Award**" of the Modeling Simulation & Software Technical Session in the 13th Ground Vehicle Systems Engineering & Technology Symposium organized by National Defense Industrial Association (NDIA)
- Coauthor for "**Best Industry Paper Award**", The 2020 IEEE International Conference on Prognostics and Health Management.
- Nominated by the Department Chair of Mechanical Engineering for the "**Research Progress Award**" in the College of Engineering and Computing, Oct. 2022 and Oct. 2023.
- Awards to students/postdocs under my supervision:
  - Mr. Ge Song (Ph.D. Candidate): Third Place in **Graduate Student Competition** in 2023 IEEE Southeast Conference.
  - Mr. Junlin Ou (Ph.D. Candidate): Award of **SPARC Graduate Research Grant** in the University of South Carolina for the project entitled "Autonomous Multi-Robot Cooperation and Real-time Planning for Intelligent Manufacturing and Warehousing".
  - Mr. Benjamin Albia (MS Student): 2020 **Army Research Laboratory Student Summer Fellowship**
  - Dr. Jung Il Shu (Postdoc): The second place in **Postdoctoral Poster Session Competition** in the DiscoverUofSC 2022 Technology Showcase.
  - Dr. Jung Il Shu (Postdoc): **ASPIRE-I Award** in the University of South Carolina for the project entitled "A Framework based on Parametric Reduced Order Modeling and Large Computational Data Analytics for Hypersonic Flow Analysis".
  - Dr. Seong Hyeon Hong (Postdoc): **ASPIRE-I Award** in the University of South Carolina for the project entitled "Embedded Machine Learning Platform for Automated Fault Detection and Mitigation in Dynamic Systems".
- **Cover Story** of Analytical Methods (Royal Society of Chemistry), "Identification of Mesenchymal Stem Cell Differentiation State Using Dual-Micropore Microfluidic Impedance Flow Cytometry", Nov. 2016.
- **Cover Story** of Analytical Methods (Royal Society of Chemistry), "Concurrent DNA Preconcentration and Separation in Bipolar Electrode-Based Microfluidic Device", Feb. 2015.
- **NASA Technical Innovation Brief Awards**: "Method and Apparatus for Automated Isolation of Nucleic Acids from Small Cell Samples" MSC-24375-1, 2012.
- **Hot Article** of *Lab on a chip* (Royal Society of Chemistry), "System-Oriented Dispersion Models of General Shaped Electrophoresis Channels". The paper has been recognized as "**very significant**" to the field of integrated biological and chemical microsystems. July 2004
- **Best Poster Award**, Microfluidic/Biosensor Workshop at University of Pennsylvania, June 2003
- **National Excellence Scholarship**, Shanghai Jiao Tong University, P.R. China, Oct. 2000
- **National Excellence Scholarship**, Shanghai Jiao Tong University, P.R. China, Oct. 1999
- **Excellent Graduate**, Shanghai Jiao Tong University, P.R. China, June 1998

- **First Prize of Wanbang & Cao Wenjin Scholarship**, Shanghai Jiao Tong University, Mar. 1998
- **Excellent Student**, Shanghai Jiao Tong University, P.R. China, Oct. 1997
- **Second Prize of the Excellence Scholarship** of Shanghai Jiao Tong University, Sep.1997
- **Third Prize of the Excellence Scholarship** of Shanghai Jiao Tong University, Sep. 1996
- **Excellent Student**, Shanghai Jiao Tong University, P.R. China, Oct. 1995
- **Second Prize of the Excellence Scholarship** of Shanghai Jiao Tong University, Sep. 1995

## RESEARCH SUPERVISION

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### A. Research Faculty and Postdoctoral Fellow

1. Dr. Junlin Ou (01/2024 – **Present**). Topic: Real-time Edge Computing for Autonomous Systems
2. Dr. Xianzhang Xu (09/2023 – **Present**). Topic: Aeroelastic Reduced Order Modeling and Synthesis for Aerostructural Control
3. Dr. Doug Cahl (05/2023 – **Present**). Topic: EO/IR and Radar Data Acquisition in Littorals
4. Dr. Chad Severt (08/2022 – **Present**). Topic: Multifidelity Optimization and Controller Design
5. Dr. Jinhyuk Kim (08/2022 – **Present**). Topic: Aeroelastic Reduced Order Modeling and Energy and Health Monitoring of Manufacturing Systems
6. Dr. Jaechan Lim (07/2022 – 07/2023). Topic: Signal Processing of EO/IR Sensor Data in Littoral Environments and data assimilation of numerical weather prediction.
7. Dr. Jung Shu (09/2019 – 03/2023). Topic: Multiphysics CFD Analysis and Reduced Order Modeling
8. Dr. Seong Hyeon Hong (08/2018–06/2022). Topic: Data driven modeling and online machine learning and model predictive control
9. Dr. Jin Pyo Lee (09/2021-10/2021). Topic: Deep learning modeling and optimization for guided weapons
10. Dr. Zhuocheng Jiang (07/2020–10/2021). Topic: Deep learning and computer vision for intelligent traffic systems.
11. Dr. Roozbeh Golshan (01/2019–05/2019). Topic: Nonlinear reduced order modeling for ground vehicle thermal analysis
12. Dr. Shengwei Zhu (11/2017–02/2019). Topic: Data driven modeling, data analytics, and multiphysics simulation.

### B. Ph.D. Students

1. Feng Bai (08/2017 – 08/2021: **Completed**). Topic: Reduced order modeling based on hybrid snapshot simulation
2. Haizhou Yang (08/2018 – 05/2022: **Completed**). Topic: Multi-Fidelity Surrogate and Reduced-Order Model-Based Microfluidic Concentration Gradient Generator Design
3. Feng Guo (08/2018 – 12/2021: co-advise with his major advisor, Prof. Yu Qian in Civil and Environmental Engineering, **Completed**). Topic: Computer Vision-Based Automatic Railroad Crossing Monitoring and Track Inspection
4. Junlin Ou (01/2020 – 12/2023: **Completed**). Topic: Real-time Edge Computing for Autonomous Systems
5. Fatemeh Hashemian (01/2020-**present**: **Passed Ph.D. Comprehensive Exam**. I became her dissertation research advisor starting in May 2022). Topic: Structural Dynamics Reduced Order Models.
6. Jacob Rains (05/2021–**present**). Topic: Non-intrusive Nonlinear Thermal Reduced Order Modeling of Ground Vehicles.
7. Ge Song (08/2021–**present**). Topic: Computer Vision and Anomaly Detection of Pedestrian Behavior
8. Md Asfiqur Rahman (08/2021–**present**). Topic: Multiphase CFD Investigation on Transport Behavior of Ballast Drainage
9. Jiawei Guo (01/2022–**present**). Topic: Image Processing and Computer Vision for Rail Track Inspection
10. Md Amanullah Kabir Tonmoy (08/2022–**present**). Topic: Multifidelity surrogate modeling and optimization of track-vehicle interaction
11. Yichuan Cao (08/2022 – **Present**). Topic: Modeling and Optimization of Energy Consumption of Robotic Systems
12. Luke Bagan (01/2022 – **Present**). Topic: Reliable Perception for Unmanned Maritime Systems
13. Tristan Kyzer (08/2023 – **Present**). Topic: Autonomous machine learning and localization

14. William Krolick (08/2019–08/2021). Topic: State-consistent parametric aeroelastic reduced order model database

### C. M.S. Students

1. Luke Bagan (01/2022– 12/2023: **Completed**). Topic: Wide View And Line Filter For Enhanced Image Gradient Computation And Edge Determination
2. Yichuan Chao (01/2022– 08/2023: **Completed**). Topic: GPU-Enabled Genetic Algorithm Optimization and Path Planning of Robotic Arm for Minimizing Energy Consumption
3. Tristan Kyzer (08/2019– 05/2021: **Completed**). Topic: Instrumentation and Experimentation Development for Robotic Systems
4. Benjamin Albia (08/2019– 12/2021: **Completed**). Topic: Nonlinear Intelligent Model Predictive Control of Mobile Robots
5. Jacob Whisenant (08/2023-Present). Topic: Advanced Perception in Littoral Environments
6. Christian Turner (08/2020– 1/2022, co-advise with his major advisor, Prof. Bin Zhang at Electric Engineering). Topic: Leader-Follower Formation Control based on Computer Vision and Lidar Sensing

## TEACHING ACTIVITIES

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### University of South Carolina:

1. ASEP 466 – **Flight Dynamics and Control** (S 2021 - S2024)
2. EMCH 501– **Engineering Analysis I**: Graduate-level course (F 2019 – F 2023)
3. EMCH 201– **Introduction to Applied Numerical Methods**: Undergraduate-level course (S 2018, F 2018, S 2019, F 2019, S 2020)
4. EMCH 427– **Mechanical Engineering Senior Design**: Serving as Advisor on Senior Design Project (F 2017, F 2018, F 2019, F 2021, F2022, F2023)
5. EMCH 428– **Mechanical Engineering Senior Design**: Serving as Advisor on Senior Design Project and Competition (S 2018, S 2019, S 2020, S 2022, S 2023, S 2024)

## PUBLICATIONS

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### **#. Group members under my supervision**

#### **\* Corresponding author(s)**

### A. Book Chapters

1. **Y. Wang**, Q. Lin\* and T. Mukherjee, "Composable Behavioral Models and Schematic-Based Simulation of Electrokinetic Lab-on-a-Chip Systems," *Design Automation Methods and Tools for Microfluidics-Based Biochips*, 2006, pp. 109-142, K. Chakrabarty and J. Zeng, Eds. Norwell, MA: Springer.
2. A.S. Bedekar, **Y. Wang**, S. Krishnamoorthy\*, S. S. Siddhaye, and S. Sundaram, "System-Level Simulation of Flow-Induced Dispersion in Lab-on-a-Chip Systems," *Design Automation Methods and Tools for Microfluidics-Based Biochips*, 2006, pp. 189-214, K. Chakrabarty and J. Zeng, Eds. Norwell, MA: Springer.

### B. Book Reviews

1. H. Song<sup>#</sup>, **Y. Wang\***, K. Pant, "Model Order Reduction," *Encyclopedia of Micro-and Nano-fluidics*, 2014, pp. 1-16, DOI: 10.1007/978-3-642-27758-0\_1047-3, D. Li, Eds. Springer.
2. **Y. Wang\***, A.S. Bedekar, S. Krishnamoorthy, S. Sundaram, A. K. Singhal, "Model Order Reduction," *Encyclopedia of Micro-and Nano-fluidics*, 2008, pp. 1382-1391, D. Li, Eds. Springer.

## C. Refereed Journal Articles (82 in total)

### 2024:

1. X. Wei, D. Ma, J. Ou<sup>#</sup>, G. Song<sup>#</sup>, J. Guo<sup>#</sup>, J. Robertson, **Y. Wang**, Q. Wang, C. Liu, “Narrowing Signal Distribution by Adamantane Derivatization for Amino Acid Identification Using  $\alpha$ -Hemolysin Nanopore”, Nan Letters, (Accepted)
2. Y. Tang, **Y. Wang**, Y. Qian, “Edge-computing Oriented Real-Time Missing Track Components Detection Transportation Research Board”, Transportation Research Record, (Accepted)
3. J. Rains<sup>#</sup>, **Y. Wang\***, A. House, A.L. Kaminsky, N.A. Tison, V.M. Korivi, “Constrained Optimized Dynamic Mode Decomposition with Control for Physically Stable Systems with Exogeneous Inputs”, Journal of Computational Physics, 496, Paper No. 112604, <https://doi.org/10.1016/j.jcp.2023.112604>.

### 2023:

4. J. Guo<sup>#</sup>, S. Zhang<sup>#</sup>, Y. Qian, and **Y. Wang\***, “An Adaptively Weighted Loss-enabled Lightweight Teacher-Student Model for Real-time Railroad Inspection on Edge Devices”, Neural Computing and Applications, (Accepted).
5. J. Ou<sup>#</sup>, S.H. Hong<sup>#</sup>, G. Song<sup>#</sup>, **Y. Wang\***, "Hybrid Path Planning based on Adaptive Visibility Graph Initialization and Edge Computing for Mobile Robots", Engineering Applications of Artificial Intelligence, <https://doi.org/10.1016/j.engappai.2023.107110>.
6. H. Yang<sup>#</sup>, J. Ou<sup>#</sup>, and **Y. Wang\***, “Neural-physics Multi-fidelity Model with Active Learning and Uncertainty Quantification for GPU-enabled Microfluidic Concentration Gradient Generator Design”, Computer Methods in Applied Mechanics and Engineering, <https://doi.org/10.1016/j.cma.2023.116434>.
7. G. Song<sup>#</sup>, S.H. Hong<sup>#</sup>, T. Kyzer<sup>#</sup>, and **Y. Wang\***, “Energy Consumption Auditing based on a Generative Adversarial Network for Anomaly Detection of Robotic Manipulators”, Future Generation Computer Systems, <https://doi.org/10.1016/j.future.2023.07.034>.
8. F. Hashemian<sup>#</sup>, X. Deng, **Y. Wang**, S. Kim, R. Vaidhyanathan, "A Comprehensive Study of the Effects of Various Design Variables on the Dynamic Behavior and Vibration Characteristics of a Front-Loading Washing Machine", Noise & Vibration Worldwide, <https://doi.org/10.1177/09574565231194312>..
9. G. Song<sup>#</sup>, Y. Qian, and **Y. Wang\***, “Analysis of Abnormal Pedestrian Behaviors at Grade Crossings based on Semi-supervised Generative Adversarial Networks.”, Applied Intelligence, <https://doi.org/10.1007/s10489-023-04639-9>.
10. J. Ou<sup>#</sup>, S.H. Hong<sup>#</sup>, T. Kyzer<sup>#</sup>, H. Yang<sup>#</sup>, X. Zhou, **Y. Wang\***, "A Low-cost Indoor Positioning System based on Data-driven Modeling for Robotics Research and Education", Robotica, <https://doi.org/10.1017/S0263574723000589>.
11. H. Yang<sup>#</sup>, S.H. Hong<sup>#</sup>, Y. Qian, **Y. Wang\***, "Multi-fidelity Surrogate-based Optimization for Microfluidic Concentration Gradient Generator Design", Engineering Computations, <https://doi.org/10.1108/EC-01-2022-0037>.
12. J.I Shu<sup>#</sup>, **Y. Wang\***, A. Brown, and A. Kaminsky, “Genetic Algorithm-Guided Development of Parametric Aeroelastic Reduced-Order Models with State-Consistence Enforcement”, AIAA Journal, <https://doi.org/10.2514/6.2023-1313>.
13. L.M. Lee<sup>#</sup>, G.J. Klarmann, D.W. Haithcock, **Y. Wang**, K.H. Bhatt, B. Prabhakarandian, K. Pant, L.M. Alvarez, and E. Lai, "Label-free Enrichment of Human Adipose-Derived Stem Cells using a Continuous Microfluidic Sorting Cascade", Lab on a Chip, <https://doi.org/10.1039/D2LC01138G>.
14. E.A. Ogunniyi, C. Drnek, S.H. Hong<sup>#</sup>, A. Downey, **Y. Wang**, J. Bakos, P. Avitabile, J. Dodson, "Real-time Structural Model Updating using Local Eigenvalue Modification Procedure for Applications in High-Rate Dynamic Events", Mechanical Systems and Signal Processing, <https://doi.org/10.1016/j.ymssp.2022.100427>.
15. Y. Tang, **Y. Wang**, and Y. Qian\*, “Railroad Crossing Surveillance and Foreground Extraction Network (RC-SAFE)-a weakly supervised AI approach” Transportation Research Record: Journal of the

Transportation Research Board, Transportation Research Board of the National Academies,  
<https://doi.org/10.1177/0361198123115940>.

16. F. Guo<sup>#</sup>, **Y. Wang**, and Y. Qian, "Real-Time Dense Traffic Detection Using Lightweight Backbone and Improved Path Aggregation Feature Pyramid Network." *Journal of Industrial Information Integration*, <https://doi.org/10.1016/j.jii.2022.100427>.

## 2022:

17. J.I. Shu<sup>#</sup>, **Y. Wang**<sup>\*</sup>, W. Krolick<sup>#</sup>, K. Pant, "Aeroelastic Reduced Order Model with State Consistence Enforcement", *AIAA Journal*, <https://doi.org/10.2514/1.J062274>, 2022.
18. H. Yang<sup>#</sup>, **Y. Wang**<sup>\*</sup>, "A Sparse Multi-fidelity Surrogate-based Optimization method with Computational Awareness", *Engineering with Computers*, <https://doi.org/10.1007/s00366-022-01766-8>, 2022.
19. Z. Jiang<sup>#</sup>, S. H. Hong<sup>#</sup>, B. Albia<sup>#</sup>; A. A. Hood, A. J. Hall, J. Cornelius, **Y. Wang**<sup>\*</sup>, "A Multi-feature Fusion Network Model for Bearings Condition Assessment in Accelerated Aging Experiments", *Neural Computing and Applications*, 35, 5923-5937, 2023.
20. J.I. Shu<sup>#</sup>, **Y. Wang**, Y. Qian, J.A Khan, "Analysis of the Effect of Shoulder Cleaning on Particle Migration within Ballast Based on a Coupled CFD-DEM Approach", *Transportation Geotechnics*, <https://doi.org/10.1016/j.trgeo.2022.100855>, 2022.
21. S.H. Hong<sup>#</sup>, J. Ou<sup>#</sup>, **Y. Wang**<sup>\*</sup>, "Physics-guided Neural Network and GPU-Accelerated Nonlinear Model Predictive Control for Quadcopter ", *Neural Computing and Applications*, <https://doi.org/10.1007/s00521-022-07783-4>, 2022.
22. Z. Jiang<sup>#</sup>, G. Song<sup>#</sup>, Y. Qian, **Y. Wang**<sup>\*</sup>, "A deep learning framework for detecting and localizing abnormal pedestrian behaviors at grade crossing", *Neural Computing and Applications*, <https://doi.org/10.1007/s00521-022-07660-0>, 2022.
23. F. Bai<sup>#</sup>, **Y. Wang**<sup>\*</sup>, "DEIM-Embedded Hybrid Snapshot Simulation to Accelerate Reduced Order Model Generation", *Engineering Computations*, DOI (10.1108/EC-11-2021-0647) (Accepted).
24. H. Yang<sup>#</sup>, S.H. Hong<sup>#</sup>, G. Wang, **Y. Wang**<sup>\*</sup>, "Multi-Fidelity Reduced-order Model for GPU-Enabled Microfluidic Concentration Gradient Design", *Engineering with Computers*, <https://doi.org/10.1007/s00366-022-01672-z>, 2022.
25. H. Yang<sup>#</sup>, S.H. Hong<sup>#</sup>, **Y. Wang**<sup>\*</sup>, "A Sequential Multi-Fidelity Surrogate-based Optimization Methodology based on Expected Improvement Reduction", *Structural and Multidisciplinary Optimization*, Vol. 65, Art. No. 153, 2022.
26. F. Bai<sup>#</sup>, **Y. Wang**<sup>\*</sup>, " A reduced order modeling method based on GNAT-embedded hybrid snapshot simulation", *Mathematics and Computers in Simulation*, Vol. 199, pp. 100-132, 2022.
27. J. Ou<sup>#</sup>, S.H. Hong<sup>#</sup>, P. Ziehl, **Y. Wang**<sup>\*</sup>, "GPU-based Global Path Planning using Genetic Algorithm with Near Corner Initialization", *Journal of Intelligent & Robotic Systems*, 104, 34, 2022.
28. F. Guo<sup>#</sup>, Z. Jiang<sup>#</sup>, **Y. Wang**, C. Chen, Y. Qian<sup>\*</sup>, "Dense Traffic Detection at Railroad Grade Crossings", *IEEE Intelligent Transportation Systems Transactions*, <https://ieeexplore.ieee.org/document/9686603>, 2022.
29. S.H. Hong<sup>#</sup>, J.I. Shu<sup>#</sup>, J. Ou<sup>#</sup>, **Y. Wang**<sup>\*</sup>, "GPU-Enabled Microfluidic Design Automation for Concentration Gradient Generators", *Engineering with Computers*, <https://link.springer.com/article/10.1007/s00366-021-01548-8>, 2022.
30. F. Guo<sup>#</sup>, **Y. Wang**, Y. Qian<sup>\*</sup>, "Computer Vision-Based Approach for Smart Traffic Condition Assessment at Railroad Grade Crossing", *Advanced Engineering Informatics*, Vol. 51, Art. No. 101456, 2022.
31. Z. Jiang<sup>#</sup>, F. Guo<sup>#</sup>, Y. Qian, **Y. Wang**<sup>\*</sup>, W. D. Pan, "A Deep Learning-Assisted Mathematical Model for Decongestion Time Prediction at Railroad Grade Crossings", *Neural Computing and Applications*, Vol. 34, pp. 4715–4732, 2022.

## 2021:



32. S.H. Hong<sup>#</sup>, J.I. Shu<sup>#</sup>, **Y. Wang\***, O. Baysal, "Automated Design of Double Heater Convective Polymerase Chain Reaction Devices based on CFD Simulation Database and Artificial Neural Network Model", *Biomedical Microdevices*, Vol. 23, Art. No. 20, 2021.
33. J.I. Shu<sup>#</sup>, **Y. Wang**, Y. Qian<sup>\*</sup>, J.A. Khan, S. Schmidt, "Numerical Analysis of Temporal Effect of Ballast Shoulder Cleaning", *Transportation Geotechnics*, Vol. 28, Art. No. 100532, 2021.
34. W.C. Krolick<sup>#</sup>, J.I. Shu<sup>#</sup>, **Y. Wang\***, K. Pant, "State Consistence of Data-driven Reduced Order Models for parametric Aeroelastic Analysis", *SN Applied Sciences*, Vol. 3, Art. No. 267, 2021.
35. S.H. Hong<sup>#</sup>, J. Cornelius, **Y. Wang\***, K. Pant, "Optimized Artificial Neural Network Model and Compensator in Model Predictive Control for Anomaly Mitigation", *Journal of Dynamic Systems, Measurement and Control*, Vol. 143, No. 5, Art. No. 051005, 2021.
36. J.I. Shu<sup>#</sup>, S.H. Hong<sup>#</sup>, **Y. Wang\***, and O. Baysal, "Surrogate- and Possibility-based Design Optimization for Convective Polymerase Chain Reaction Device", *Microsystem Technologies*, Vol. 27, pp. 2623-2638, 2021.
37. F. Bai<sup>#</sup>, and **Y. Wang\***, "Reduced Order Modeling based on Hybrid Snapshot Simulation", *International Journal of Computational Methods*, Vol. 18, No. 1, Art. No. 2050029, 2021.
38. J. Wang, **Y. Wang**, J. Shi<sup>\*</sup>, "A Time Step Fusion Method with Finite Volume Formulation for Accelerated Thermal Analysis of Selective Laser Melting", *International Journal of Precision Engineering and Manufacturing-Green Technology*, Vol. 8, pp. 1181-1196, 2021.
39. A.L. Kaminsky<sup>\*</sup>, **Y. Wang\***, and K. Pant, An Efficient Batch K-Fold Cross-Validation Voronoi Adaptive Sampling Technique for Global Surrogate Modeling, *Journal of Mechanical Design*, Vol. 143, No. 1, Art. No. 011706, 2021.

#### **2020:**

40. F. Bai<sup>#</sup>, **Y. Wang\***, "DEIM Reduced Order Model Constructed by Hybrid Snapshot Simulation", *SN Applied Sciences*, Vol. 2, Art. No. 2165, 2020.
41. S.H. Hong<sup>#</sup>, H. Yang<sup>#</sup>, and **Y. Wang\***, "Inverse Design of Microfluidic Concentration Gradient Generator using Deep Learning and Physics-based Component Model", *Journal of Microfluidics and Nanofluidics*, Vol. 24, Art. No. 44, 2020.
42. H. Yang<sup>#</sup>, S.H. Hong<sup>#</sup>, R. ZhG, and **Y. Wang\***, "Surrogate-based Optimization with Adaptive Sampling for Microfluidic Concentration Gradient Generator Design", *RSC Advances*, 10, 13799-13814, 2020.
43. J.I. Shu<sup>#</sup>, J.W. Lee, S. Kim, J.L. Lee<sup>\*</sup>, and **Y. Wang**, "Multi-Stage Liquid Rocket Weight Estimation and Optimization for Early Design Stages", *Journal of Aerospace Engineering*, Vol. 33, No. 6, 04020069, 2020.
44. J. Wang, **Y. Wang**, J. Shi<sup>\*</sup>, "On Efficiency and Effectiveness of Finite Volume Method for Thermal Analysis of Selective Laser Melting", *Engineering Computation*, Vol. 37, No. 6, 2155-2175, 2020.
45. P. Borate, G. Wang<sup>\*</sup>, **Y. Wang**, "Data-Driven Structural Health Monitoring Approach Using Guided Lamb Wave Responses", *Journal of Aerospace Engineering*, Vol.33, No.4, 04020033, 2020.

#### **2019:**

46. S.H. Hong<sup>#</sup>, J. Cornelius, **Y. Wang\***, K. Pant, "Fault Compensation by Online Updating of Genetic Algorithm-selected Neural Network Model for Model Predictive Control", *SN Applied Sciences* (Springer), 1:1488, 2019.
47. S. Zhu<sup>#</sup>, **Y. Wang\***, "Scaled Sequential Threshold Least-Squares (S2TLS) Algorithm for Sparse Regression Modeling and Flight Load Prediction", *Aerospace Science and Technology*, Vol. 85, 514-528, 2019.

#### **2018:**

48. E. D. Robertson<sup>#</sup>, **Y. Wang\***, K. Pant, M. J. Grismer, J. A. Cameros, "A Flow Feature Detection Framework for Large-scale Computational Data Based on Incremental Proper Orthogonal Decomposition and Data Mining", *International Journal of Computational Fluid Dynamics*, Vol. 32, 261-277, 2018.
49. L. M. Lee<sup>#</sup>, J. M. Rosano<sup>#</sup>, **Y. Wang\***, G. J. Klarmann, C. J. Garson, B. Prabhakarpaniana, K. Pant<sup>\*</sup>, L. M. Alvarezcd and E. Lai, "Label-Free Mesenchymal Stem Cells Enrichment from Bone Marrow Samples by Inertial Microfluidics", *Analytical Methods*, Vol. 10, 713-721, 2018.

## 2017:

50. J. Zhu<sup>#</sup>, **Y. Wang**<sup>\*</sup>, K. Pant, P.M. Suh, M.J. Brenner, "Genetic Algorithm-based Model Order Reduction of Aeroservoelastic Systems with Consistent States", *Journal of Aircraft*, Vol. 54, pp. 1443-1453, 2017
51. H. Song<sup>#</sup>, J.M.Rosano<sup>#</sup>, **Y.Wang**<sup>\*</sup>, C.J. Garson, B. Prabhakarpanidian, K. Pant, G.J. Klarmann, L. M. Alvarez, E. Lai, "Spiral-shaped inertial stem cell device for high-throughput enrichment of iPSC-derived neural stem cells", *Microfluid Nanofluid*, Vol. 21: 64. DOI:10.1007/s10404-017-1896-5, 2017

## 2016:

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65. **Y. Wang\***, Q. Lin, J. Hoburg and T. Mukherjee, "Modeling of Joule Heating in Electrophoretic Separation Microchips", *5th International Conference on Modeling and Simulation of Microsystems*, pp. 80-83, 2002.
66. X. Zhou\*, **Y. Wang**, J. Xia, B. Shen, "Research on Dynamic Characteristics of Double Evaporators in VRV Air Conditioner", *2000 International Conference of Air Conditioning in High Rise Buildings (ACHRB)*, pp. 279-283, 2000.
67. J. Xia\*, F. Xiao, X. Jin, **Y. Wang**, G. Huang, "Optimal Sizing Analysis of Water Chillers in Large Air Conditioning System", *2000 International Conference of Air Conditioning in High Rise Buildings (ACHRB)*, pp. 145-149, 2000.
68. B. Shen\*, Z. Su, **Y. Wang**, "Control of Air-Conditioner with Inverter Using Evaporating Pressure as Middle-Target via Fuzzy Method", *2000 International Refrigeration Conference at Purdue*, pp. 457-464, 2000.
69. B. Shen\*, Z. Su, **Y. Wang**, "Research On Characteristics Of Double-Evaporators In VRV Air Conditioner", *2000 International Refrigeration Conference at Purdue*, pp. 135-142, 2000.
70. **Y. Wang**, X. Zhou, J. Xia, and W. Chen, "Study of Fuzzy Self-Adaptive PID Control Method of Electronic Expansion Valve in Air Conditioning Systems with Inverter-aid Compressor", *Annual Conference of Chinese Society of Engineering Thermodynamics*, pp. 54-59, 2000, Beijing, P.R.China (Chinese).
71. **Y. Wang**, X. Zhou, J. Xia, and W. Chen, "Transient Simulation Study of Superheat Degree in Air Conditioning Systems with Inverter-aid Compressor", *Annual Conference of Chinese Society of Engineering Thermodynamics*, pp. 60-65, 2000, Beijing, P.R.China. (Chinese)



## **E. Presentations (80 in total)**

### **Invited Presentations at Professional Meetings (1 total)**

#### **2018:**

1. "Surrogate Modeling and Data Analytics for Flight Load Analysis" at the *49th International Symposium of Society of Flight Test Engineers (SFTE)*, 2018.

### **Contributed Presentations (69 in total)**

#### **2024:**

1. J.C. Rains<sup>#</sup>, D. Huang, **Y. Wang\***, "Residual Dynamic Mode Decomposition with Control for Nonlinear Aeroservoelastic Applications", AIAA SciTech 2024 Forum, No. 2264, <https://arc.aiaa.org/doi/abs/10.2514/6.2024-2264>, 2024.
2. C.D. Chad<sup>#</sup>, J. Kim<sup>#</sup>, J.I. Shu<sup>#</sup>, **Y. Wang\***, J. Simac, A. Kaminsky, "Aerostructural Control based on Parametric State-Consistent Reduced Order Models", AIAA SciTech 2024 Forum, No. 1010, <https://arc.aiaa.org/doi/abs/10.2514/6.2024-1010>, 2024.
3. C.D. Chad<sup>#</sup>, J. Kim<sup>#</sup>, J.I. Shu<sup>#</sup>, **Y. Wang\***, J. Simac, A. Kaminsky, "Optimal Sensor Placement for Field Reconstruction and Aerostructural Control Using State-Consistent Parametric Reduced Order Models", AIAA SciTech 2024 Forum, No. 2797, <https://arc.aiaa.org/doi/abs/10.2514/6.2024-2797>, 2024.
4. J. Kim<sup>#</sup>, J.I. Shu<sup>#</sup>, **Y. Wang\***, J. Simac, A. Kaminsky, "Parametric Aeroservoelastic-Gust Reduced-Order Models with State Consistence Enforcement", AIAA SciTech 2024 Forum, No. 1011, <https://arc.aiaa.org/doi/abs/10.2514/6.2024-1011>, 2024.
5. A.M House, A. Kaminsky, **Y. Wang\***, F. Alam, K. Pant, N. Tison, V. Korivi, "A POD-based input-output reduced-order modeling framework for acceleration of coupled-solver workflows", AIAA SciTech 2024 Forum, No. 0254, <https://arc.aiaa.org/doi/abs/10.2514/6.2024-0254>, 2024.

#### **2023:**

6. J. Guo, S. Zhang, Y. Qian, **Y. Wang\***, "A NanoDet Model with Adaptively Weighted Loss for Real-time Railroad Inspection", Annual Conference of the PHM Society, 15(1), <https://doi.org/10.36001/phmconf.2023.v15i1.3498>, 2023.
7. G. Song, S.H. Hong, T. Kyzer, **Y. Wang\***, "An Energy Consumption Auditing Anomaly Detection System of Robotic Manipulators based on a Generative Adversarial Network". Annual Conference of the PHM Society, 15(1). <https://doi.org/10.36001/phmconf.2023.v15i1.3496>, 2023.
8. F. Hashemian, W. Zhao, **Y. Wang\***, "A Reduced Order Model for Static and Buckling Analysis of Thin-Walled Stiffened Plate on A Non-Conformal Mesh". International Mechanical Engineering Congress and Exposition (IMECE)/ASME, Paper No. IMECE2023-113162, 2023.
9. G. Song<sup>#</sup>, Y. Qian, **Y. Wang\***, "A Deep Generative Adversarial Network (GAN)-enabled Abnormal Pedestrian Behavior Detection at Grade Crossings ", IEEE SoutheastCon, 2023, DOI: 10.1109/SoutheastCon51012.2023.10114963.
10. J. Ou<sup>#</sup>, S.H. Hong, **Y. Wang\***, "Adaptive Visibility Graph Initialization on Edge Computing to Accelerate Hybrid Path Planning for Mobile Robots ", IEEE SoutheastCon, 2023, DOI: 10.1109/SoutheastCon51012.2023.10115186.
11. J. Shu<sup>#</sup>, **Y. Wang\***, W. Krolick, K. Pant, "Genetic Algorithm-Guided Parametric Aeroelastic Reduced-Order Model with State-Consistence Enforcement", AIAA SciTech Conference, Paper No. 2023-1313, 2023.
12. J. Shu<sup>#</sup>, **Y. Wang\***, A. Brown, A. Kaminsky, " Parametric Aeroelastic Reduced-Order Modeling with Hyperparameter Optimization for Flutter Analysis ", AIAA SciTech Conference, Paper No. 2023-2701, 2023.

#### **2022:**

13. **Y. Wang\***, "Development of Parametric Aeroelastic Reduced Order Model Database Based on Genetic Algorithm and State Consistence Enforcement", Aerospace Flutter and Dynamics Council (AFDC) Meeting, San Jose, October 13-14, 2022.
14. H. Yang<sup>#</sup>, S.H. Hong<sup>#</sup>, **Y. Wang\***, "A Novel Adaptive Sampling Method Based on Expected Improvement Reduction", IEEE Southeast Conference, 10.1109/SoutheastCon48659.2022.9764023, 2022.

15. S.H. Hong<sup>#</sup>, K. Kyzer<sup>#</sup>, J. Cornelius, F. Zahiri, **Y. Wang\***, “Intelligent Anomaly Detection of Robot Manipulator Based on Energy Consumption Auditing”, IEEE Aerospace Conference, 10.1109/AERO53065.2022.9843528, 2022.
16. J. Shu<sup>#</sup>, **Y. Wang\***, W. Krolick<sup>#</sup>, and K. Pant, “Aeroelastic Reduced Order Model with State Consistence Enforcement”, AIAA SciTech, Paper No. AIAA 2022-0990, 2022.
17. S.H. Hong<sup>#</sup>, **Y. Wang\***, and Y. Yu, “Model Predictive Control of Quadcopter Using Physics-guided Neural Network”, AIAA SciTech, Paper No. AIAA 2022-1730, 2022.
18. A. Brown, A. Kaminsky, **Y. Wang**, K. Pant, and M. McDaniel, "An Approach for the Automated Adjustment of Local Models for Improved Adaptive Design of Experiments", AIAA SciTech, Paper No. AIAA 2022-0302, 2022.

**2021:**

19. Y. Qian, **Y. Wang**, Kashani, H., and Fanucci, F., “Effect of Ballast Shoulder Cleaning on Fouling Particles Migration within Ballast Matrix” 2021 American Railway Engineering and Maintenance-of-Way Association Annual Conference, Indianapolis, IN, September 2021.
20. F. Guo<sup>#</sup>, Y. Qian\*, **Y. Wang**, D.C. Rizos, and Y. Shi, “Laboratory Study on Frost Heave of Ballast” In: Tutumluer E., Nazarian S., Al-Qadi I., Qamhia I.I. (eds) *Advances in Transportation Geotechnics IV. Lecture Notes in Civil Engineering*, vol 166. Springer, Cham. [https://doi.org/10.1007/978-3-030-77238-3\\_37](https://doi.org/10.1007/978-3-030-77238-3_37).
21. A.L. Kaminsky, I. Wolf, **Y. Wang**, S.H. Hong<sup>#</sup>, K. Pant, K. Flynn, R. Thompson, and C. Jarvis, “A Simulation Framework of Multi-objective Evolutionary Algorithms and Surrogate-based Optimization for Guided Weapon Design”, The 89<sup>th</sup> Military Operations Research Society (MORS) Symposium 2021.
22. S.H. Hong<sup>#</sup>, A. House, A.L. Kaminsky, N. Tison, Y. Ruan, V. Korivi, **Y. Wang\***, K. Pant, "Machine Learning-based Thermal and Flow Simulation on Heterogeneous Platform for Signature Prediction", Ground Vehicle Systems Engineering and Technology Symposium 2021.
23. **Y. Wang\***, W.C. Krolick, A.L. Kaminsky, N. Tison, Y. Ruan, V. Korivi, K. Pant, "A Hybrid Reduced Order Modeling Approach for Rapid Transient Thermal Simulation and Signature Analysis", Ground Vehicle Systems Engineering and Technology Symposium 2021.
24. W.C. Krolick<sup>#</sup>, **Y. Wang\***, K. Pant, “Nonlinear Aeroelastic Reduced Order Modeling Based on Nested Optimization and Regularization”, AIAA SciTech Forum, Paper No. AIAA-2021-1912, 2021.

**2020:**

25. J. Cornelius, B. Brockner, S.H. Hong<sup>#</sup>, **Y. Wang**, K. Pant, J. Ball, “Estimating and Leveraging Uncertainties in Deep Neural Networks for Remaining Useful Life Prediction”, 2020 IEEE International Conference on Prognostics and Health Management, 10.1109/ICPHM49022.2020.9187063, 2020.
26. S.H. Hong<sup>#</sup>, C. Drnek, A. Downy\*, **Y. Wang**, J. Dodson, and J. Hong, “Real-Time Model Updating Algorithm for Structures Experiencing High-rate Dynamic Events”, The ASME 2020 Conference on Smart Materials, Adaptive Structures and Intelligent Systems, Paper No. SMASIS2020-2439, 2020.
27. H. Song<sup>#</sup>, **Y. Wang\***, and K. Pant, “Parametric Fluid-structural Interaction Reduced Order Models in Continuous Time Domain for Aeroelastic Analysis of High-speed Vehicles”, Proceedings of AIAA SciTech 2020, Paper No. AIAA 2020-0939, 2020.
28. S. H. Hong<sup>#</sup>; J. Cornelius, **Y. Wang\***, K. Pant, “Online Machine Learning Model Compensator for Model Predictive Control and Anomaly Mitigation of Mechanical Systems”, Proceedings of AIAA SciTech 2020, Paper No. AIAA 2020-2251, 2020.
29. R. DeVine, Y. Qian\*, **Y. Wang**, S. Wang, and D. Rizos, “Characterize Rail Crack Pattern through Image Analysis”, JRC 2020, Paper No. JRC2020-8121.
30. F. Guo<sup>#</sup>, Y. Qian, **Y. Wang**, D.C. Rizos, S. Wang, and H. Yu, “Real-Time Traffic Congestion Assessment and Decongestion Time Prediction at Grade Crossing for the First Responders”, Transportation Research Board 2020 Annual Meeting, 2020.

**2019:**

31. S.H. Hong<sup>#</sup>, H. Yang<sup>#</sup>, and **Y. Wang\***, “Inverse Design of Microfluidic Concentration Gradient Generator using Deep Neural Network and Physics-based Models”, *2019 2nd International Conference on Algorithms, Computing and Artificial Intelligence (ACAI 2019)*, Abstract No.: A25.

32. W.C. Krolick<sup>#</sup>, **Y. Wang\***, K. Pant, "Parametric Data-Driven Reduced Order Models with State Consistency for Aeroelastic Analysis", ASME/IMECE, 2019, Paper No. 11333.
33. C. S. Talley, T. J. Wray, **Y. Wang**, and S. D. Habchi, "Flutter Analysis at Variable Mach and Angle of Attack Utilizing Reduced-Order Models", Proceedings of the International Forum on Aeroelasticity and Structural Dynamics 2019.
34. J. Wang, J. Shi, **Y. Wang**, Y. Bai, "Thermal Analysis and Verification for Direct Metal Deposition of 0Cr18Ni9 Stainless Steel", MSEC2019, ASME Manufacturing Science and Engineering Conference, Paper No.: MSEC2019-2892, 2019.

**2018:**

35. S. Zhu<sup>#</sup>, **Y. Wang\***, "Flight Load Analysis and Prediction Based on Scaled Sequential Threshold Least-Squares ( $S^2$ TLS) Algorithm", ASME/IMECE, 2018.
36. A. L Kaminsky, **Y. Wang\***, K. Pant, W. N. Hashii, A. Atachbarian, "Adaptive sampling techniques for surrogate modeling to create high-dimension aerodynamic loading response surfaces", 2018 Applied Aerodynamics Conference, AIAA AVIATION Forum, Paper ID AIAA 2018-4199, 2018.
37. Y. Qian, S. Zhu<sup>#</sup>, **Y. Wang** and Dimitris C. Rizos, Simulating Fouling Material Transport in Ballast, 2018 Joint Rail Conference, Paper No. JRC2018-6187, 2018.
38. **Y. Wang\***, K. Pant, M.J. Brenner, J.A. Ouellette, "Greedy Sampling and Incremental Surrogate Model-based Tailoring of Aeroservoelastic Model Database for Flexible Aircraft", 59th AIAA Structures, Structural Dynamics, and Material Conference, Paper ID AIAA 2018-1210, 2018.
39. L.M. Lee<sup>#</sup>, **Y. Wang**, C.J. Garson, et. al., "Enrichment of Human Adipose-Derived Stem Cells by a Spiral-shaped Inertial Microfluidic Sorter", The 21st International Conference on Miniaturized Systems for Chemistry and Life Sciences (MicroTAS 2017), Paper No. M188h.
40. J. Zhu<sup>#</sup>, **Y. Wang\***, K. Pant, P.M. Suh, M.J. Brenner, "Genetic Algorithm-Guided, Adaptive Model Order Reduction of Flexible Aircrafts", 58th AIAA/ASCE/AHS/ASC Structures, Structural Dynamics, and Material Conference, Paper ID AIAA 2017-1598, 2017.
41. **Y. Wang\***, H. Song, K. Pant, M.J. Brenner, P. Suh, "Model Order Reduction of Aeroservoelastic Model of Flexible Aircraft", 57th AIAA/ASCE/AHS/ASC Structures, Structural Dynamics, and Material Conference, Paper ID. AIAA 2016-1222, 2016.
42. H. Song<sup>#</sup>, J.M. Rosano<sup>#</sup>, G.J. Klarmann, C.J. Garson, B. Prabhakarandian, L.M. Alvarez, E. Lai, **Y. Wang\***, Kapil Pant, "High Throughput Enrichment of iPSC-Derived Neural Stem Cells using Spiral-shaped Inertial Microfluidic Devices", International Conference of Microfluidics, Nanofluidics and Lab-on-a-Chip, Paper ID. 11-437, 2016.
43. **Y. Wang\***, K. Pant, P. Suh, M. Brenner, "Genetic Algorithm-based Model Order Reduction of Aeroservoelastic Systems with Consistent States for X-56A MUTT", Aerospace Flutter and Dynamics Council Meeting, 2016.
44. H. Song<sup>#</sup>, J.M. Rosano<sup>#</sup>, **Y. Wang\***, et al., "A Continuous-Flow Microfluidic Device for The Separation of Stem Cells and Their Differentiation Progeny Based On Dielectrophoresis", MicroTAS 2015, pp. 361-363, 2015.
45. H. Song<sup>#</sup>, J. Qian<sup>#</sup>, **Y. Wang\*** et al. "Development of Aeroelastic and Aeroservoelastic Reduced Order Models for Active Structural Control", 56th AIAA/ASCE/AHS/ASC Structures, Structural Dynamics, and Material Conference, paper ID: 2015-2055, 2015.
46. **Y. Wang\***, "Parameter-Varying AeroServoElastic Reduced Order Model for X-56A", Aerospace Flutter and Dynamics Council Meeting, 2015.
47. **Y. Wang\***, H. Song<sup>#</sup>, K. Pant, "An Accurate Real-Time Simulation Tool for Generating Missile Hardbody Thermal Histories", National Space & Missile Materials Symposium (NSMMS), 2014.
48. H. Song<sup>#</sup>, **Y. Wang\***, C. Garson, K. Pant, "Nafion film based nanofluidic device for concurrent DNA preconcentration and separation", IEEE NANO, 549-552, 2013.

49. H. Song<sup>#</sup>, **Y. Wang\***, K. Pant, "Three-Dimensional Analytical Model for Pressure-Driven Cross-Stream Diffusion in Microchannels with Arbitrary Aspect Ratios", *ASME 3rd International Conference on Micro/Nanoscale Heat and Mass Transfer (MNHMT)*, pp. 27-37, 2012
50. **Y. Wang\***, H. Song<sup>#</sup>, K. Pant, H. Peabody, J. Ku, and C.D. Butler, "A Projection-Based Model Order Reduction Simulation Tool for Spacecraft Thermal Analysis", *2011 Thermal & Fluids Analysis Workshop (TFAWS)*, Paper ID: TFAWS2011-PT-001, 2011
51. **Y. Wang\***, H. Song<sup>#</sup>, K. Bhatt<sup>#</sup>, K. Pant, "Electrokinetics Models for Micro and Nano Fluidic Impedance Sensors", *27th Annual Army Science Conference*, Paper ID: AP-009, 2010
52. **Y. Wang\***, H. Song<sup>#</sup>, K. Bhatt<sup>#</sup>, J. Rosano<sup>#</sup>, K. Pant, "An Integrated, Electrokinetics-Augmented Microfluidic Device for Forensic DNA Analysis", *Sci. Conf. Chem. Bio. Defense Res.*, 2010.
53. H. Song<sup>#</sup>, **Y. Wang\***, K. Pant, "System-level Simulation of Liquid Filling in Microfluidic Chips", *Lab on a Chip World Congress*, 2010.
54. **Y. Wang\***, K. Pant, "System-Level Modeling of Surface-Immobilized Biomolecular Concentration Gradient Generation", *ASME 1st International Conference on Micro/Nanoscale Heat and Mass Transfer (MNHMT)*, 179-186, 2009.
55. **Y. Wang\***, K. Pant, ZJ Chen, W. Diffey, P. Ashley, S. Sundaram, "Numerical Analysis of Nanofluidic Sample Preconcentration in Hydrodynamic Flow", *11th International Conference on Modeling and Simulation of Microsystems*, pp. 442-445, 2008.
56. **Y. Wang\***, K. Pant ZJ Chen, W. Diffey, P. Ashley, and S. Sundaram. "Numerical Analysis of Electrokinetic Transport at Micro-Nanofluidic Interfaces in Hydrodynamic Flow and Applications in Sample Preconcentration", *Eighth International Electrokinetic Conference*, 2008.
57. **Y. Wang\***, K. Pant, J. Grover, S. Sundaram, "Multi-physics Simulation Analysis of a Novel PCR Micro-Device", *10th International Conference on Modeling and Simulation of Microsystems*, Vol. 3, pp. 456-459, 2007.
58. **Y. Wang**, Q. Lin\* and T. Mukherjee, "System-Level Modeling and Design of Microfluidic Concentration Gradient Generators". *1st IEEE International Conference on Nano/Micro Engineered and Molecular Systems*, pp. 1368-1373, 2006.
59. **Y. Wang\***, A.S. Bedekar, S. Krishnamoorthy *et. al.* "Mixed methodology-based system level simulation of biochemical assays in integrated microfluidic systems", *9th International Conference on Modeling and Simulation of Microsystems*, pp. 546-549, 2006.
60. **Y. Wang**, R. Magargle, Q. Lin, J.F. Hoburg and T. Mukherjee, "System-Oriented Modeling and Simulation of Biofluidic Lab-on-a-chip", *The 13th International Conference on Solid-State Sensors, Actuators and Microsystems (Transducers '05)*, pp. 1280-1283, 2005.
61. **Y. Wang\***, Q. Lin and T. Mukherjee, "System Simulations of Complex Electrokinetic Passive Micromixers", *8th International Conference on Modeling and Simulation of Microsystems*, pp. 579-582, 2005.
62. **Y. Wang\***, Q. Lin and T. Mukherjee, "Applications of Behavioral Modeling and Simulation on Lab-on-a-chip: Micro-Mixer and Separation System", *2004 IEEE International Behavioral Modeling and Simulation Conference*, pp. 1-6, 2004.
63. **Y. Wang\***, Q. Lin and T. Mukherjee, "Models for Joule Heating Dispersion in Complex Electrophoretic Separation Microchannels", *2004 ASME International Mechanical Engineering Congress and Exposition*, No. 60970, 2004.
64. **Y. Wang\***, Q. Lin and T. Mukherjee, "Analytical Models for Complex Electrokinetic Passive Micromixers", *The 8th International Conference on Miniaturized Systems for Chemistry and Life Sciences (MicroTAS)*, pp. 596-598, 2004.
65. **Y. Wang\***, Q. Lin and T. Mukherjee, "Composable System Simulation of Dispersion in Complex Electrophoretic Separation Microchips", *7th International Conference on Modeling and Simulation of Microsystems*, pp. 59-62, 2004.

66. **Y. Wang\***, Q. Lin and T. Mukherjee, “Analytical Dispersion Models for Efficient Simulation of Complex Microchip Electrophoresis Systems”, *The 7th International Conference on Miniaturized Systems for Chemistry and Life Sciences (MicroTAS)*, pp. 135-138, 2003.
67. **Y. Wang\***, Q. Lin and T. Mukherjee, “Universal Joule Heating Model in Electrophoretic Separation Microchips”, *The 6th International Conference on Miniaturized Systems for Chemistry and Life Sciences (MicroTAS)*, pp. 82-84, 2002.
68. **Y. Wang\***, Q. Lin, J. Hoburg and T. Mukherjee, “Modeling of Joule Heating in Electrophoretic Separation Microchips”, *5th International Conference on Modeling and Simulation of Microsystems*, pp. 80-83, 2002.
69. X. Zhou\*, **Y. Wang**, J. Xia, B. Shen, “Research on Dynamic Characteristics of Double Evaporators in VRV Air Conditioner”, *2000 International Conference of Air Conditioning in High Rise Buildings (ACHRB)*, pp. 279-283, 2000.

### Seminars

1. “Configurable Parametric Aeroservoelastic Reduced-order Models for Aerostructural Sensing and Control”, Oklahoma State University, April 21<sup>st</sup>, 2023.
2. “Automated Development of Parametric Aeroelastic Reduced Order Models Across Broad Flight Regimes”, Worcester Polytechnic Institute (WPI), February 3<sup>rd</sup>, 2023.
3. “Genetic Algorithm-guided Parametric Aeroelastic Reduced Order Models with State Consistence Enforcement”, North Carolina State University, September 23, 2022.
4. “Reduced-Order Modeling Approaches for Thermal and Flow Simulation and Signature Analysis”, Ground Vehicle Systems Center, US Army, June 6, 2022.
5. “Intelligent Multi-fidelity Surrogate-based Optimization Framework for Microfluidic Concentration Gradient Generator Design”, New Jersey Institute of Technology, April 22, 2022.
6. “Parametric Aeroelastic Reduced Order Models with State Consistence Enforcement (SCE)”, Penn State University, April 4, 2022.
7. “DEIM Reduced Order Model Constructed by Hybrid Snapshot Simulation”, [SN Applied Sciences Webinar, Springer Nature](#), June 17<sup>th</sup>, 2021.
8. “An Intelligent Framework for State-consistent Model Order Reduction and Control Synthesis of Flexible Aircraft”, Arizona State University, March 26, 2021.
9. “Computational and Data-enabled Science and Engineering for Engineering Applications”, Invited Seminar at the School of Mechanical Engineering, Hefei University of Technology, July 17<sup>th</sup>, 2019
10. “A Flow Feature Detection Framework for Massive Computational Data Analytics”, Invited Seminar at the Computer Science & Engineering Department, University of South Carolina, December 7<sup>th</sup>, 2018
11. “Computational and Data-enabled Science and Engineering for Complex Multiphysics Systems”, Invited Seminar at the Mathematics Department, University of South Carolina, October 23<sup>rd</sup>, 2017
12. “Computational and Data-Enabled Science and Engineering for Multiphysics Systems”, Invited Seminar at the Iowa State University, March 9<sup>th</sup>, 2017
13. “Computational and Data-Enabled Science and Engineering for Multiphysics Systems”, Invited Seminar at the University of Cincinnati, January 27<sup>th</sup>, 2017
14. "A Review of Reduced Order Modeling (ROM) and Real-Time Simulation Techniques for Engineering Applications", Invited Seminar at the Hunan University of Science and Technology (HNUST), July 1st, 2016, Hunan, PR China.
15. "Reduced Order Modeling (ROM) Techniques for Aerospace Applications", Invited Seminar at the University of Alabama, March 10th, 2016, Tuscaloosa, Alabama.
16. "Multiphysics Variable-Fidelity Modeling and Simulation (MVF-M&S) for Biomedical Devices", Invited Seminar at Novartis Co., Sept. 16th, 2015, East Hanover, New Jersey.

## GRANTS AND CONTRACTS

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### 66 awards with a total value of \$30.38 Million

1. **Title:** Software Tool for Surrogate Modeling and Design of Experiments  
**Funding Agency:** DOD/OSD (UofSC Proposal No: 155400-23-64551) **Role:** PI  
**Amount:** \$400,033 (UofSC total & my share) **Award Period:** 09/14/2023-09/13/2025
2. **Title:** Advanced Perception for Autonomous Platforms in the Littorals  
**Funding Agency:** ONR (UofSC Proposal No: 155400-23-61396) **Role:** PI  
**Amount:** \$7,140,000 & 2,000,000 (my share) **Award Period:** 08/11/2023-08/10/2026
3. **Title:** Configurable Parametric Aeroservoelastic Reduced Order Models for Aerostructural Sensing and Control – Phase 2  
**Funding Agency:** NASA (UofSC Proposal No: 155400-23-63751) **Role:** PI  
**Amount:** \$300,003 (UofSC total & my share) **Award Period:** 05/23/2023-05/22/2025
4. **Title:** Improving Data Assimilation in Numerical Weather Prediction of Winter Cyclones using Artificial Intelligence and Machine Learning  
**Funding Agency:** NASA (UofSC Proposal No: 155400-22-60754) **Role:** PI (CoPI: Jung Shu-my postdoc)  
**Amount:** \$35,999 (UofSC total & my share) **Award Period:** 07/25/2022-01/25/2023
5. **Title:** Configurable Parametric Aeroservoelastic Reduced Order Models for Aerostructural Sensing and Control  
**Funding Agency:** NASA (UofSC Proposal No: 155400-22-60700) **Role:** PI (CoPI: Jung Shu-my postdoc)  
**Amount:** \$43,996 (UofSC total & my share) **Award Period:** 07/25/2022-01/25/2023
6. **Title:** A Deep Learning Framework for Real-Time Health and Security Monitoring and Diagnosis of Manufacturing Systems Based on Energy Consumption Auditing  
**Funding Agency:** Air Force (UofSC Proposal No: 155400-22-60324) **Role:** PI (Sole)  
**Amount:** \$359,892 (UofSC total & my share) **Award Period:** 05/09/2022-02/09/2024
7. **Title:** Parametric Reduced Order Models-based Uncertainty Quantification in Aeroelasticity  
**Funding Agency:** NASA (UofSC Proposal No: 155400-22-59633) **Role:** PI (Sole)  
**Amount:** \$250,009 (UofSC total & my share) **Award Period:** 04/28/2022-04/27/2024
8. **Title:** Reliable Perception for Unmanned Maritime Systems  
**Funding Agency:** ONR/DoD (UofSC Proposal No: 155400-21-57553) **Role:** PI (CoPIs: David Matolak, Yan Tong, Bin Zhang, Josh Knight)  
**Amount:** \$4,750,000 & \$1,442,218 (my share) **Award Period:** 11/15/2021- 11/14/2024
9. **Title:** Autonomous Power-efficient Track Inspection System (APTIS)  
**Funding Agency:** FRA (UofSC Proposal No: 155200-20-54526) **Role:** Co-PI (PI: Yu Qian)  
**Amount:** \$350,000 & \$110,000 (my share) **Award Period:** 09/10/2021- 09/09/2024
10. **Title:** Quantitative Assessment of the Influence of Drainage on Track Support  
**Funding Agency:** FRA (UofSC Proposal No: 155200-20-54527) **Role:** Co-PI (PI: Yu Qian)  
**Amount:** \$415,000 & \$150,088 (my share) **Award Period:** 08/16/2021-08/15/2024
11. **Title:** A Framework for Embedded Statistical Model Validation and Guided Data Collection  
**Funding Agency:** MDA (UofSC Proposal No: 155400-21-58261) **Role:** PI (CoPI: Seong Hyeon Hong-my postdoc)  
**Amount:** \$50,094 (UofSC total & my share) **Award Period:** 12/06/2021-08/05/2023
12. **Title:** Parametric Reduced Order Models-based Uncertainty Quantification in Aeroelasticity  
**Funding Agency:** NASA (UofSC Proposal No: 155400-21-56648) **Role:** PI (Sole)  
**Amount:** \$36,892 (UofSC total & my share) **Award Period:** 05/19/2021-11/18/2022
13. **Title:** An Intelligent Framework for Integrated State-consistent Aeroservoelstic Reduced Order Model Development and Control Synthesis  
**Funding Agency:** NASA (UofSC Proposal No: 155400-20-53909) **Role:** PI (Sole)  
**Amount:** \$35,145 (UofSC total & my share) **Award Period:** 08/31/2020- 03/01/2022
14. **Title:** Intelligent Abnormal Situation Awareness Platform (i-ASAP)

- Funding Agency:** FRA (UofSC Proposal No: 155200-20-54037) **Role:** Co-PI (PI: Yu Qian)  
**Amount:** \$255,000 (UofSC total) & \$85,410 (my share) **Award Period:** 08/28/2020- 02/27/2023
15. **Title:** Transient CFD- and Model Order Reduction-based Solver for Rapid Thermal Signature Prediction  
**Funding Agency:** Army (UofSC Proposal No: 155400-20-52141) **Role:** PI (Sole)  
**Amount:** \$404,013 (UofSC total & my share) **Award Period:** 05/29/2020- 01/14/2023
16. **Title:** Deep Learning Framework for Real-time Health and Security Monitoring and Diagnosis of Manufacturing Systems based on Energy Consumption Auditing  
**Funding Agency:** Air Force (UofSC Proposal No: 155400-20-52487) **Role:** PI (Sole)  
**Amount:** \$36,268 (UofSC total & my share) **Award Period:** 04/08/2020- 01/08/2022
17. **Title:** Railroad 4.0: intelligent Risk Assessment and Prediction System (i-RAPS)  
**Funding Agency:** FRA (UofSC Proposal No: 155200-20-52348) **Role:** Co-PI (PI: Yu Qian)  
**Amount:** \$395,000 (UofSC total) & \$130,666 (my share) **Award Period:** 6/19/2020-06/18/2023
18. **Title:** A Plug-and-Play (PnP) Tool based on in-site Adaptive Neural Network Models for Real-Time Monitoring and Control of Mechanical Systems  
**Funding Agency:** Army/ARL (UofSC Proposal No.: 15540-19-51372) **Role:** PI (Sole)  
**Amount:** \$376,912 (UofSC total & my share) **Award Period:** 12/05/2019-07/08/2022
19. **Title:** A Simulation Framework of Multi-objective Evolutionary Algorithms and Surrogate-based Optimization for Guided Weapon Design  
**Funding Agency:** Air Force/AFRL (UofSC Proposal No.: 155400-19-51593) **Role:** PI (Sole)  
**Amount:** \$179,917 (UofSC total & my share) **Award Period:** 10/18/2019-01/10/2022
20. **Title:** Multi-fidelity Surrogate Modeling and Data Fusion for Accurate Structural Buffet Load Prediction  
**Funding Agency:** Navy (UofSC Proposal No.: 155400-19-51872) **Role:** PI (Sole)  
**Amount:** \$40,311 (UofSC total & my share) **Award Period:** 08/27/2019-02/26/2021
21. **Title:** An Intelligent Framework to Develop Adaptive Parametric Reduced Order Model Database for Aerostructural Control  
**Funding Agency:** NASA(UofSC Proposal No.: 15540-19-50743) **Role:** PI (Sole)  
**Amount:** \$251,447 (UofSC total & my share) **Award Period:** 8/14/2019-05/13/2022
22. **Title:** Investigation of Fouling Particle Transport and Settlement Mechanism in Railroad Ballast for Shoulder Cleaning Optimization  
**Funding Agency:** Loram (UofSC Proposal No: 155200-20-52161) **Role:** Co-PI (PI: Yu Qian)  
**Amount:** \$172,460 (UofSC total) & \$75,669 (my share) **Award Period:** 01/01/2020- 06/23/2023
23. **Title:** Aluminum Clad Spent Nuclear Fuel Drying Experiments  
**Funding Agency:** DoE (UofSC Proposal No: 15540-20-52130 & 155400-20-53611) **Role:** Co-PI (PI: Travis Knight)  
**Amount:** \$409,590 (UofSC total) & ~\$10,000 (my share) **Award Period:** 08/06/2018- 03/15/2021
24. **Title:** Real-Time Surrogate Model Updating for Structures Experiencing High-Rate Dynamics  
**Funding Agency:** ASPIRE-I (UofSC Proposal No: 15540-19-50764) **Role:** Co-PI (PI: Austin Downey)  
**Amount:** \$15,000 (UofSC total) & ~\$4,000 (my share) **Award Period:** 5/2019- 9/2020
25. **Title:** Intelligent Crossing Assessment and Traffic Sharing System (i-CATSS)  
**Funding Agency:** FRA (UofSC Proposal No: 15520-19-49519) **Role:** Co-PI (PI: Yu Qian)  
**Amount:** \$160,000 (UofSC total) & \$66,686 (my share) **Award Period:** 08/19/2019- 08/18/2021
26. **Title:** Adaptive Surrogate-based Dynamic Modeling & Optimization for Front Loading Washing Machine  
**Funding Agency:** SC Dept. Commerce & Samsung (UofSC Proposal No: 15540-19-51359 & 15540-19-51360) **Role:** PI (CoPI: Xiaoming Deng)  
**Amount:** \$306,192 (UofSC total) & 153,096 (my share) **Award Period:** 05/16/2019-12/31/2022
27. **Title:** Intelligent Camera Aided Railway Emergency System (i-CARES): Center for Connected Multimodal Mobility Tier 1  
**Funding Agency:** FRA (UofSC Proposal No: 155200-19-49367) **Role:** Co-PI (PI: Yu Qian)  
**Amount:** \$50,000 (UofSC total) & ~\$10,000 (my share) **Award Period:** 09/15/2018- 06/15/2020
28. **Title:** Model Order Reduction for Fast and Rapid Simulation of Human and Vehicle Thermal Signatures

- Funding Agency:** Army (UofSC Proposal No: 15540-18-47974) **Role:** PI (Sole)  
**Amount:** \$45,445 (UofSC total & my share) **Award Period:** 10/22/2018-04/30/2020
29. **Title:** Multi-objective Evolutionary Algorithms for Surrogate-based Optimization of Multi-disciplinary Guided Weapon Systems  
**Funding Agency:** Air Force/AFRL (UofSC Proposal No: 15540-18-49074) **Role:** PI (Sole)  
**Amount:** \$25,299 (UofSC total & my share) **Award Period:** 10/23/2018-07/12/2019
30. **Title:** Online Machine Learning for Real-Time Monitoring and Control of Mechanical Systems  
**Funding Agency:** Army (UofSC Proposal No: 15540-19-47917) **Role:** PI (Sole)  
**Amount:** \$40,496 (UofSC total & my share) **Award Period:** 07/25/2018-01/17/2020
31. **Title:** An Intelligent Framework to Develop Adaptive Parametric Reduced Order Model Database for Aerostructural Control  
**Funding Agency:** NASA (UofSC Proposal No: 15540-18-48456) **Role:** PI (Sole)  
**Amount:** \$36,964 (UofSC total & my share) **Award Period:** 07/27/2018-01/25/2020
32. **Title:** Multi-fidelity Surrogate Modeling for Multi-Source Data Consolidation  
**Funding Agency:** NASA (UofSC Proposal No: 15540-18-48430) **Role:** PI (Sole)  
**Amount:** \$36,964 (UofSC total & my share) **Award Period:** 07/27/2018-01/25/2020
33. **Title:** Structural Dynamic and Aerodynamic Reduced Order Models for Aerospace Vehicles Applications  
**Funding Agency:** NASA (UofSC Proposal No: 15540-18-47918) **Role:** PI (Sole)  
**Amount:** \$33,410 (UofSC total & my share) **Award Period:** 2/21/2018-11/30/2019
34. **Title:** Railroad 4.0: intelligent Risk Assessment and Prediction System (i-RAPS)  
**Funding Agency:** ASPIRE-I (UofSC Proposal No: 15520-18-47736) **Role:** Co-PI (PI: Yu Qian)  
**Amount:** \$14,981 (UofSC total) & ~\$2,000 (my share) **Award Period:** 2018-2019
35. **Title:** Algorithms and Module Development for Accurate and Rapid Load Analysis and Design of Experiments  
**Funding Agency:** Army (UofSC Proposal No: 15540-18-47544) **Role:** PI (Sole)  
**Amount:** \$216,954 (UofSC total & my share) **Award Period:** 9/18/2017-11/20/2020
36. **Title:** Nonlinear Parameter-Varying AeroServoElastic Reduced Order Model for Aerostructural Sensing and Control  
**Funding Agency:** NASA (UofSC Proposal No: 15540-18-46255 & 15540-18-47666) **Role:** PI (Sole)  
**Amount:** \$118,290 (UofSC total & my share) **Award Period:** 09/04/2017-11/30/2019
37. **Title:** A Design Automation Tool for Integrated Nanophotonics based on Compact Modeling and Model Order Reduction  
**Funding Agency:** AFOSR (UofSC Proposal No: 15540-18-47063) **Role:** PI (Sole)  
**Amount:** \$60,000 (UofSC total & my share) **Award Period:** 11/15/2017-6/30/2020
38. **Title:** A Real-Time Analysis Tool based on Surrogate Models for Accurate Prediction of Combined Flight External Loads  
**Funding Agency:** Air Force (UofSC Proposal No: 15540-18-46378) **Role:** PI (Sole)  
**Amount:** \$109,515 (UofSC total & my share) **Award Period:** 10/01/2017-05/16/2019
39. **Title:** Software Tool for Accurate and Rapid Load Analysis and Design of Experiments–Phase II  
**Award Period:** 9/18/2017-9/18/2019 **Award Amount:** \$1,000,000 (my share)  
**Funding Agency:** Army/AMRDEC **Role:** PI
40. **Title:** A Design Automation Tool for Integrated Nanophotonics based on Compact Modeling and Model Order Reduction–Phase II  
**Award Period:** 7/1/2019 – 6/30/2019 **Award Amount:** \$750,000 (total) & \$500,000 (my share)  
**Funding Agency:** OSD/AFOSR **Role:** PI
41. **Title:** A Real-Time Analysis Tool based on Surrogate Models for Accurate Prediction of Combined Flight External Loads – Phase II  
**Award Period:** 09/27/2016- 12/26/2018 **Award Amount:** \$750,000  
**Funding Agency:** Air Force/AFTC **Role:** PI
42. **Title:** Electrospray Propulsion Engineering Toolkit (ESPET) – Phase II  
**Award Period:** 4/27/2016-4/26/2018 **Award Amount:** \$750,000 (total) & \$125,000 (my share)



- Funding Agency:** NASA **Role:** CFD Research-PI
43. **Title:** Nonlinear Parameter-Varying AeroServoElastic Reduced Order Model for Aerostructural Sensing and Control – Phase II  
**Award Period:** 5/11/2015 – 5/11/2017 **Award Amount:** \$750,000 (total and my share)  
**Funding Agency:** NASA **Role:** PI
44. **Title:** A fast and high-throughput microfluidic stem cell analyzer – Phase IIE  
**Award Period:** 09/21/15 – 02/20/2018 **Award Amount:** \$1,000,000 (total) and \$840,000 (my share)  
**Funding Agency:** OSD-DHP **Role:** PI
45. **Title:** A Novel, Aerodynamics-augmented Continuous Ionization System for Electrostatic Collection of Bioaerosols–Phase II  
**Award Period:** 01/15/14 –12/15/16 **Award Amount:** \$1,000,000 (total and my share)  
**Funding Agency:** CBD **Role:** PI
46. **Title:** Real-time Parameter-Varying AeroThermoServoElasticity Reduced Order Model–Phase I  
**Award Period:** 8/25/2015 –6/16/2016 **Award Amount:** \$150,000 (total and my share)  
**Funding Agency:** Air Force **Role:** PI
47. **Title:** A Real-Time Analysis Tool based on Surrogate Models for Accurate Prediction of Combined Flight External Loads – Phase I  
**Award Period:** 8/18/2014 –5/17/2015 **Award Amount:** \$150,000 (total and my share)  
**Funding Agency:** Air Force/AFTC **Role:** PI
48. **Title:** Nonlinear Parameter-Varying AeroServoElastic Reduced Order Model for Aerostructural Sensing and Control – Phase I  
**Award Period:** 6/20/2014 – 12/19/2014 **Award Amount:** \$125,000 (total and my share)  
**Funding Agency:** NASA **Role:** PI
49. **Title:** A General-Purpose Software Tool for Multi-disciplinary Simulation Data Management and Learning–Phase II  
**Award Period:** 2/15/2014 –11/14/16 **Award Amount:** \$750,000 (total) and \$535,000 (my share)  
**Funding Agency:** AFOSR **Role:** PI
50. **Title:** A Design Automation Tool for Integrated Nanophotonics based on Compact Modeling and Model Order Reduction–Phase I  
**Award Period:** 6/1/2014 – 11/30/2014 **Award Amount:** \$150,000 (total) and \$117,500 (my share)  
**Funding Agency:** OSD/AFOSR **Role:** PI
51. **Title:** An Integrated Field-deployable Nanofluidic Sequencing Platform for Polypeptides–Phase I  
**Award Period:** 7/9/2014 – 1/8/2015 **Award Amount:** \$100,000 (total) and \$70,000 (my group’s share)  
**Funding Agency:** Army/ARO **Role:** PM
52. **Title:** An automated, high throughput, resin-free device for large scale protein purification–Phase II  
**Award Period:** 5/20/2014 – 2/12/2017 **Award Amount:** \$1,000,000 (total) and \$707,000 (my share)  
**Funding Agency:** CBD **Role:** PM
53. **Title:** A fast and high-throughput microfluidic stem cell analyzer–Phase II  
**Award Period:** 05/13/13 –05/12/15 **Award Amount:** \$1,000,000 (total) and \$817,000 (my share)  
**Funding Agency:** OSD-DHP **Role:** PI
54. **Title:** Software for Automated Generation of Reduced Order Models for Spacecraft Thermal Control–Phase II  
**Award Period:** 06/01/11–02/28/13 **Award Amount:** \$600,000 (total and my share)  
**Funding Agency:** NASA/GSFC **Role:** PI
55. **Title:** A Miniaturized Sensor for Microbial Monitoring of Spacecraft Water Environment–Phase II  
**Award Period:** 06/01/11–02/28/13 **Award Amount:** \$600,000 (total and my share)  
**Funding Agency:** NASA/MSFC **Role:** PI
56. **Title:** A Novel, Aerodynamics-augmented Continuous Ionization System for Electrostatic Collection of Bioaerosols–Phase I  
**Award Period:** 03/21/13–04/30/14 **Award Amount:** \$150,000 (total and my share)

- Funding Agency:** CBD **Role:** PI
57. **Title:** An automated, high throughput, resin-free device for large scale protein purification–Phase I  
**Award Period:** 04/09/13–05/12/14 **Award Amount:** \$150,000 (total and my group’s share)  
**Funding Agency:** CBD **Role:** PM
58. **Title:** Simulation Tool to Rapidly Design Optimize and Prototype Microfluidic Devices–Phase II  
**Award Period:** 07/01/09–06/30/13 **Award Amount:** \$802,500 (total and my share)  
**Funding Agency:** NIH/NHGRI **Role:** PI
59. **Title:** A General-Purpose Software Tool for Multi-disciplinary Simulation Data Management and Learning–Phase I  
**Award Period:** 03/01/12 –12/01/13 **Award Amount:** \$100,000 (total) and \$70,000 (my share)  
**Funding Agency:** AFOSR **Role:** PI
60. **Title:** Nonlinear Aeroservoelastic Reduced Order Model For Active Structural Control–Phase I  
**Award Period:** 02/15/12 –8/13/12 **Award Amount:** \$125,000 (total and my share)  
**Funding Agency:** NASA/DFRC **Role:** PI
61. **Title:** A Fast And High-Throughput Microfluidic Stem Cell Analyzer–Phase I  
**Award Period:** 01/23/12 –08/23/12 **Award Amount:** \$150,000 (total and my share)  
**Funding Agency:** OSD-DHP **Role:** PI
62. **Title:** An Accurate 3D Real-Time Simulation Tool For Generating Hardbody Thermal Histories –Phase I  
**Award Period:** 06/27/11 –12/27/11 **Award Amount:** \$100,000 (total and my share)  
**Funding Agency:** MDA **Role:** PI
63. **Title:** An Automated, High Throughput, Filter-Free Pathogen Preconcentrator –Phase I  
**Award Period:** 09/17/10 –03/30/11 **Award Amount:** \$100,000 (total) and (\$68,000) my share)  
**Funding Agency:** Army/ARO **Role:** PI
64. **Title:** An Integrated, Electrokinetics-augmented Microfluidic Device for Forensic DNA Analysis –Phase I  
**Award Period:** 3/22/2010 – 10/21/2010 **Award Amount:** \$100,000 (total and my share)  
**Funding Agency:** DTRA **Role:** PI
65. **Title:** Miniaturized Sensor for Microbial Monitoring of Spacecraft Water Environment –Phase I  
**Award Period:** 01/29/2010 – 07/29/2010 **Award Amount:** \$100,000 (total and my share)  
**Funding Agency:** NASA/MSFC **Role:** PI
66. **Title:** Software for Automated Generation of Reduced Order Models for Spacecraft Thermal Control–Phase I  
**Award Period:** 01/29/2010 – 07/29/2010 **Award Amount:** \$100,000 (total and my share)  
**Funding Agency:** NASA/GSFC **Role:** PI

## **PATENTS**

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1. “Autonomous Drone for Railroad Track Inspection”, US Application No. 63/317652, 2022.
2. “Miniaturized Electrothermal Flow Induced Infusion Pump”, U.S. Patent No. 9,283,597, **Non-provisional Patent** Filed on Sept. 6, 2006
3. “Electrostatic Aerosol Concentrator”, U.S. Patent No. 8,246,720 B2, **Non-provisional Patent** Filed on Jul. 31, 2007
4. “Microfluidic Biological Extraction Chip”, U.S. Patent No. 8,435,465 B2, **Non-provisional Patent** Filed on Nov.3, 2008
5. “Method and Apparatus for Separating Particles by Dielectrophoresis”, U.S. Patent No. 8,778,160 B2, **Non-provisional Patent** Filed on Jul.26, 2011
6. “Bipolar Electrode Sample Preparation Devices”, U.S. Appl. No. 14/202,105, **Non-provisional Patent** Filed on Mar. 10, 2014

## **PROFESSIONAL ACTIVITIES AND SERVICES**

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### **A. Membership of Professional Societies**

Senior Member, American Institute of Aeronautics and Astronautics (AIAA)

Member, American Society of Mechanical Engineers (ASME)

### **B. Conference Organization**

- **2023-Present:** Track Chair: Advances in Aerospace Technology, Co-organizing 19 topics, IMECE/ASME
- **2022-Present:** Track Co-chair: Advances in Aerospace Technology, Co-organizing 17 topics, IMECE/ASME
- **2022-Present:** Topic co-organizer of ASME Structures, Structural Dynamics, and Materials (SSDM) Conference, 2023
- **2018-Present:** Member of Structures and Materials Technical Committee (TC) of the Aerospace Division, ASME
- **2023-Present:** Member of Non-deterministic Approaches Technical Committee (TC), AIAA
- **2020-2022:** Co-organizer for Track 4 “Advances in Aerospace Technology” in ASME/IMECE
- **2023:** Will be topic organizer and session chair for “Computer Methods and Reduced Order Modeling” in ASME/SSDM
- **2019:** Session Chair for the 2<sup>nd</sup> International Conference on Algorithms, Computing, and Artificial Intelligence
- **2019-2020:** Session Chair/Co-session Chair for the topic “Computational Aerospace Structural Dynamics and Aeroelasticity” in ASME/IMECE
- **2022:** Session Chair/Co-session Chair for topic “General Aerospace” in ASME/IMECE
- **2022:** Session Chair/Co-session Chair for topic “Application of Artificial Intelligence/Machine Learning in Aerospace Engineering I”.
- 2009: Session Co-chair for 2019 Micro/Nanoscale Heat and Mass Transfer International Conference

### **C. Reviewer of Journals and Conferences**

- **2022:** Reviewed journal 5 papers (Journal of Mechanical Design, Structural Health Monitoring, Lab on a Chip, Fluids, The Aeronautical Journal), 7 papers for ASME/IMECE conference, and 11 papers for AIAA/SciTech conference).
- **2021:** Reviewed 6 journal papers (ISA Transactions, Applied Mathematical Modeling, Journal of Mechanical Design, Chemical Engineering and Technology, Engineering Computations, and Computer Modeling in Engineering and Sciences) and 7 papers for AIAA/SciTech Best Paper Award.
- **2020:** Reviewed 7 journal papers (SN Applied Sciences, Scientific Reports, Aerospace Science and Technology, PLOS ONE, The Aeronautical Journal, Biophysics Review, Journal of Mechanical Design) and 16 papers for ASME/IMECE conference.
- **2019:** Reviewed 3 journal papers (SN Applied Sciences, Journal of Nanoparticle Research, and Biomicrofluidics) and 7 papers for ASME/IMECE conference
- **2018:** Reviewed 2 journal paper (Engineering Applications of Computational Fluid Mechanics and Annals of Biomedical Engineering) and 9 papers for ASME/IMECE Conference

Journal of Micromechanics and Microengineering, Microfluidics and Nanofluidics, Talanta, Journal of Microelectromechanical Systems, Biomedical Microdevices, 2006 IEEE Sensors Conference, 2006 ASME International Mechanical Engineering Congress and Exposition (IMECE), 2008 ASME 2nd International Conference & Exhibition of Integration & Commercialization of Micro & Nanosystems, 2009 & 2012 Micro/Nanoscale Heat and Mass Transfer International Conference, 2013 IEEE NANO Conference

#### **D. Reviewer of Research Proposals**

- Review 5 proposals for NSF in 2022.
- Reviewed 1 proposal for DoE NNSA/MSIPP & TEPP Program Proposal Review
- Reviewed 1 proposal for Oak Ridge Associated Universities (ORAU) – Nazarbayev University Commercialization Review in 2020.
- Reviewed 1 proposal for DoD HBCU proposals of the University of Texas at San Antonio in 2019.
- Reviewed 6 proposals for NSF Computational and Data Enabled Science and Engineering (CDS&E) Program in 2018.

### **CAMPUS ACTIVITIES AND SERVICES**

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#### **A. University**

- 09/2019-03/2020: The member of Faculty Search Committee for UofSC AI Institute
- 2018: Panel reviewer for UofSC's ASPIRE program

#### **B. Department of Mechanical Engineering**

- 01/2019-Present: Member, Aerospace Engineering Program
- 10/2019-Present: Course coordinator of EMCH201 for ABET review
- 08/2019-Present: Committee member and Chair (2022), Departmental Award Committee
- 01/2019-Present: Committee member, Department Graduate Studies Committee
- 01/2019-Present: Committee member, Department Seminar Committee
- 12/2020-Present: Faculty Search Committee, Mechanical/Aerospace Engineering
- 2018-2019: Judge for poster presentation of ME undergraduate sensor design projects
- 04/2019: Organized and hosted presentation and visit of invited speaker for ME's seminar series.
- 2018-Present: Face-to-face Interview with multiple faculty candidates
- 2018-Present: Advisor for ME Undergraduate Senior Design project
- 2018-Present: Committee Member for Ph.D. Comprehensive Exam and/or Defense: Wei Chang (ME), Jiaxuan Ma (ME), Yueyang Zhao (ME), Guanghuan Huang (ME), Fatemeh Hashemian, and Shuai Yuan (Math), Shuai Wang (EE).
- 2018-Present: Committee Member for MS Defense: Claire Drnek (ME), Nate Cooper (ME), and Travis Stewart (ME)