Mohamad Aslani ***Curriculum vitae***

CONTACT INFORMATION

Florida State University
Department of Mathematics
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Tallahassee, Florida, 32304 USA

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Research Gate
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RESEARCH INTERESTS

Computational Fluid Dynamics: Multiphase flows, Combustion, Adaptive wavelet collocation method, Boundary layer stability and transition
Mathematical programming: Optimization algorithms, Machine learning-based modeling & design

CURRENT EMPLOYMENT

Post-Doctoral Research Associate
Department of Mathematics, Florida State University
Supervisor: *Professor M. Yousuf Hussaini*

EDUCATION

Iowa State University, Ames, Iowa, USA
Doctor of Philosophy (PhD), Aerospace Engineering (Awarded May 2017)
Advisor: Jonathan D. Regele
- Thesis: "*Numerical simulation of compressible flows with interfaces*"

University of Tehran, Tehran, Iran
Bachelor of Science in Mechanical Engineering
- Thesis: "*Heat transfer enhancement (optimization) in ventilated brake discs*"

ACADEMIC PROFESSIONAL EXPERIENCES & AWARDS

- Post-Doctoral Research Associate, Florida State University, (Fall 2017 - Present)
- Research Assistant, Department of Aerospace Engineering, Iowa State University, (Fall 2011 - Spring 2017)
- Teaching Assistant, lecturer, & mentor at Iowa State University:
  - Mechanics of Material (Fall 2016)
  - Engineering Statics & Dynamics (Fall 2016)
  - Advanced Compressible Flow (Spring 2017)
  - Advanced Propulsion Systems (Fall 2013)
- Teaching Assistant & lecturer at University of Tehran:
  - Optimization of Engineering Systems (Fall 2010)
  - Advanced Engineering Mathematics (2008 to Spring 2011)
- NSF XSEDE Computational Grant: "*Direct Numerical Simulation of boundary-layer stability and transition using adaptive wavelet collocation method*" (2.25M CPU hour)
- Graduate Research Excellence Award, Iowa State University (Spring 2017)

- Professional Development Travel Grant, Iowa State University (Falls 2012, 2016)

JOURNAL PUBLICATIONS (ACCEPTED)

Mohamad Aslani, Jonathan D. Regele, "*A localized artificial diffusivity method to simulate compressible multiphase flows using the stiffened gas equation of state."* International Journal for Numerical Methods in Fluids (2018).

Mohamad Aslani, Jonathan D. Regele, "*Numerical simulation of finite disturbances interacting with laminar premixed flames*." Journal of Combustion Theory and Modeling (2018)

Ghasemi, Parnian, Mohamad Aslani, Derrick K. Rollins, and R. C. Williams. "*Principal component analysis-based predictive modeling and optimization of permanent deformation in asphalt pavement: elimination of correlated inputs and extrapolation in modeling.* Structural and Multidisciplinary Optimization (2018).

Ghasemi, Parnian, Mohamad Aslani, Derrick K. Rollins, R. Christopher Williams, and Vernon R. Schaefer. "*"Modeling rutting susceptibility of asphalt pavement using principal component pseudo inputs in regression and neural networks."* International Journal of Pavement Research and Technology (2018).

Mohamad Aslani, Parnian Ghasemi, and Amir H. Gandomi. "*Constrained mean-variance mapping optimization for truss optimization problems."* The Structural Design of Tall and Special Buildings (2017)

Regele, Jonathan D., David R. Kassoy, Mohamad Aslani, and Oleg V. Vasilyev. "*Evolution of detonation formation initiated by a spatially distributed, transient energy source*." Journal of Fluid Mechanics (2016)

Nejat, A., Mohamad Aslani, E. Mirzakhalili, and R. Najian Asl. "*Heat Transfer Enhancement in Ventilated Brake Disk Using Double Airfoil Vanes*." Journal of Thermal Science & Engineering Applications (2011)

Rahami, H., A. Kaveh, Mohamad Aslani, and R. Najian Asl. "*A hybrid modified genetic-nelder mead simplex algorithm for large-scale truss optimization.*" International Journal of Optimization in Civil Engineering (2011)

MANUSCRIPTS (SUBMITTED OR PREPARED)

Mohamad Aslani, Oleg V. Vasilyev, MY Hussaini, "*High-order Adaptive Wavelet-based Computational Methodology for Direct Numerical Simulation of Compressible Boundary Layer Stability and Transition"* To be submitted to AIAA Journal

Mohamad Aslani, Oleg V. Vasilyev, MY Hussaini, "*Numerical Simulation of Shock-Boundary Layer interaction using Parallel Adaptive Wavelet Collocation Method."* To be submitted to JCP.

Parnian Ghasemi, Mohamad Aslani, Derrick K. Rollins, R. Christopher Williams, "*A*

Principal Component based Neural Network for Prediction and Optimization of Hot Mix Asphalt Dynamic Modulus"submitted to Journal of Computing in Civil Engineering

CONFERENCE PUBLICATIONS

Jonathan D. Regele, Zahra Hosseinzadeh-Nik, Mohamad Aslani, Mark Owkes. "*Numerical simulation of a shock wave impacting a droplet using the adaptive wavelet collocation method*." ILASS-AMERICAS (2016)

Mohamad Aslani, Jonathan D. Regele. "*Finite Amplitude Disturbances Interaction with Premixed Laminar Flames.*" 25th ICDERS (2015)

Mohamad Aslani, R. Najian, R. Oftadeh, and M. Shariat Panahi."*A novel hybrid simplex-genetic algorithm for the optimum design of truss structures.*" In Proceedings of the World Congress on Engineering (2010)

Nejat, A., E. Mirzakhalili, Mohamad Aslani, and R. Najian Asl. "*Heat transfer enhancement in ventilated brake disc using airfoil vanes.*" CANCAM (2011)

CONFERENCE TALKS

Parnian Ghasemi, Mohamad Aslani, Derrick K. Rollins, R.Christopher Williams. "*Accurate Modeling and Optimization of Permanent Deformation in Asphalt Pavement via the Application of Principal Component Analysis*", 55th Petersen Asphalt Research Conference (2018)

Ghasemi, Parnian, Mohamad Aslani, Derrick K. Rollins, and R. Christopher Williams. "Developing a Machine Learning Based Framework for Prediction and Optimization of Hot Mix Asphalt Dynamic Modulus." Transportation Research Board 98th Annual Meeting (2019)

Jonathan D. Regele, Daniel P. Garrick, Zahra H. Nik, Mohamad Aslani, and Mark Owkes. "*A compressible multiphase framework for simulating supersonic atomization.*" 69th APS DFD Meeting, Portland OR (2016)

Mohamad Aslani, and Jonathan D. Regele. "*Numerical simulation of compressible multiphase flows using the Parallel Adaptive Wavelet-Collocation Method.*" 68th APS DFD Meeting, Boston MA (2015)

Mohamad Aslani, and Jonathan D. Regele. "*Finite amplitude wave interaction with premixed laminar flames.*" 67th APS DFD Meeting, San Francisco (2014)

INVITED TALKS

"*Numerical simulation of shock flame interaction*" Invited by Dr. Daniel Zimmerman, Aerospace Graduate Seminar Series, Department of Aerospace Engineering, Iowa State University, Ames, Iowa (Oct. 2015)

"*Numerical simulation compressible flows with interfaces*" Invited by Dr. Koroush Shole, FSU-FAMU ME Seminar Series, Florida State University, Tallahassee, Florida (January 2018)

OTHER PUBLICATIONS

Patent: Mohamad Aslani, Reza N. Asl, Ehsan M. Khalili, "*Ventilated brake disc with compound blades.*" Department of Companies Registration & Industrial Property, Tehran, Iran (2010)

Book: Ramin Abkar, Mohamad Aslani, "*Advanced Engineering Mathematics*" (Published in Farsi), 1st edition Aug. 2009, 2nd edition Aug. 2011.

PROFESSIONAL SERVICES

- Reviewer for:
  - Computer & Fluids, Elsevier
  - Swarms & Evolutionary Algorithms, Elsevier
  - Journal of Thermal Science and Engineering, ASME
  - Journal of Mechanical Science and Technology, Springer
  - International Conference on Dynamics of Explosions and Reactive Systems (invited as co-reviewer)

- EM SUCCESS center mentor, Iowa State University (2016)

- Chair of Exhibitions, ISME Conference, Tehran, Iran (2009)

- Professional Societies:
  - The American Society of Mechanical Engineers (ASME)
  - The American Institute of Aeronautics and Astronautics (AIAA)
  - The American Physical Society (APS)
  - Institute for Liquid Atomization and Spray Systems (ILASS)

SKILLS

Programming: Fortran, C, C++, MATLAB, OpenMP/MPI, Shell scripts
CFD: Ansys Fluent, Gambit
Optimization: Knitro, Snopt, Gurobi, Tomlab, Cplex, Ipopt, Bonmin
HPC: XSEDE Servers, Condo (Intel E5), NEOS, Servers
OS & Software: Linux, Paraview, Tecplot, Solidworks, MS office, LaTeX