Mohammad Mohaghar

Shock Tube and Advanced Mixing Laboratory
Georgia Institute of Technology
(678) 900-5453
mmohaghar3@gatech.edu
mohaghar@gmail.com

EDUCATION

PhD Mechanical Engineering (GPA:4.0) 2014-Present
Georgia Institute of Technology

PhD Thesis: "Initial Condition and Density Contrast Effects on Turbulent Mixing Transition in a Shock-driven Variable-density Flow"

Thesis advisor: Prof. Devesh Ranjan

MSc Mechanical Engineering (GPA:4.0) 2015-2017
Georgia Institute of Technology

MSc Energy for Sustainability (GPA:18/20) 2012-2014
University of Coimbra

MSc Thesis: "Developing a Novel Method for Predicting Nearshore and Offshore Wave Energy of the Portuguese Coast"

Thesis advisor: Prof. Almerindo Ferreira

MSc Automotive Engineering 2008-2010
Iran University of Science and Technology

MSc Thesis: "Analysis and Improvement of Longitudinal and Lateral Stability of an Off-Road Vehicle Moving on a Slope Submitted to External Impact Loading"

Thesis advisor: Prof. Javad Marzbanrad

BSc Mechanical Engineering 2004-2008
University of Tehran

BSc Thesis: "Modifications and Improvements of FSW Welding"

Thesis advisor: Prof. Mohammad Kazem Besharati Givi

RESEARCH EXPERIENCE

Graduate Research Assistant 2014-Present
Georgia Institute of Technology

Research: Experimental Fluid Mechanics, Turbulence, Richtmyer-Meshkov Instability, Simultaneous Particle Image Velocimetry and Planar Laser Induced Fluorescence (PLIF) Measurements

- Address the influence of modal content of the initial condition on the Richtmyer-Meshkov instability transition to a turbulent state
- Investigate the influence of Atwood numbers on turbulent mixing transition of a shock-driven variable density flow
- Compare experimental results to numerical simulations with the FLASH code in two dimensions

Research Fellow 2012-2014
University of Coimbra

Research: Renewable Energy Systems Particularly Ocean Wave Energy

- Developed a novel numerical method for predicting nearshore wave energy using Delft3d and DelftDashboard
- Modeled and simulated a hospital building with different HVAC systems using Energy Plus in order to reduce energy consumption

Research Fellow 2008-2010
Iran University of Science and Technology

Research: Optimization of Automotive Suspension Systems

- Optimized the double-wishbone suspension system of an off road vehicle in critical position by modified Genetic Algorithm

TEACHING EXPERIENCE

Teaching Assistant 2016
Georgia Institute of Technology

- Introduction to Fluid Mechanics

Teaching Assistant 2006-2010
University of Tehran

- Thermodynamics
- Engineering Economy

Teaching 2006-2009
Payam Hedayat, Emam Hadi & Talash High Schools

- Mathematics
- Physics

INDUSTRIAL WORK EXPERIENCE

Heat Exchanger & Pressure Vessel Designer 2011-2012
GarmaGostar Co.

Product Engineer 2010-2011
Mapna Locomotive Co.

AWARDS AND AFFILIATIONS

- Member of American Physical Society, 2014 – Present
- Recorded a patent for Hybrid Portable Generator in Iran - 2011
- Full scholarship from Iran University of Science and Technology for Masters in Automotive Engineering, 2008 - 2010
- Full scholarship from University of Tehran for BSc in Mechanical Engineering, 2004 - 2008
- Passed the first level of the National Physics and Mathematics Olympiads with a distinction - 2003

TECHNICAL SKILLS

Experimental Techniques

Particle Image Velocimetry (PIV) techniques, Planar Laser Induced Florescence (PLIF) measurements and image processing, Flow visualization

Computer Programs

Matlab, C++, Fortran, Python, Visual Basic, LabView, Tecplot, AutoCAD, SolidWorks, FLASH, TSI Insight, LaVision DaVis, Delft3D, SWAN, ADAMS, PDMS, Energy Plus

PEER-REVIEWED JOURNAL PAPERS [statistics]

2. M. Mohaghar, J. Carter, B. Musci, D. Reilly, J. McFarland and D. Ranjan, "Evaluation of turbulent mixing transition in a shock-driven variable-density flow", *Journal of Fluid Mechanics* **831**, 779-825 (2017).

1. D. Reilly, J. McFarland, M. Mohaghar and D. Ranjan, "The effects of initial conditions and circulation deposition on the inclined-interface reshocked Richtmyer–Meshkov instability", *Experiments in Fluids* **56**, 168 (2015).

CONFERENCE PRESENTATIONS

7. M. Mohaghar, J. Carter, G. Pathikonda and D. Ranjan, "Investigation of Atwood ratio influence on turbulent mixing transition of a shock-driven variable density flow after reshock", *Bulletin of the American Physical Society* , Denver (2017).

6. M. Mohaghar, J. Carter, B. Musci and D. Ranjan, "Experimental investigation of the effect of multimodal inclined interface on Richtmyer-Meshkov instability evolution", *APS Meeting Abstracts* , Portland (2016).

5. V. Tsiklashvili, D. Reilly, M. Mohaghar, J. Carter and D. Ranjan, "Effect of the initial conditions on the evolution of Richtmyer - Meshkov instability turbulent quantities", *IWPCTM* , Sydney (2016).

4. D. Reilly, M. Mohaghar, J. Carter, J. McFarland and D. Ranjan, "Progress on Simultaneous PLIF/PIV Measurements for a Turbulent Complex Fluid Interface", *APS Meeting Abstracts* , Boston (2015).

3. M. Mohaghar, D. Reilly, J. Carter, J. McFarland and D. Ranjan, "Simultaneous PLIF/PIV measurements for a single-mode inclined interface", *APS Meeting Abstracts* , Boston (2015).

2. D. Reilly, J. Carter, M. Mohaghar, D. Jarrahbashi, J. McFarland and D. Ranjan, "Observations of Variable-Density Turbulence From a Complex Fluid Interface", *APS Shock Compression of Condensed Matter Meeting Abstracts* , Tampa (2015).

1. M. Mohaghar, Z. Mousavi Karimi and A. Ferreira, "DEVELOPING A NOVEL METHOD FOR PREDICTING NEARSHORE WAVE ENERGY OF MATOSINHOS, PORTUGAL", *Energy for Sustainability Multidisciplinary Conference* , Coimbra (2013).