Faraz Hedayati, PhD

EDUCATION

PhD, Mechanical Engineering | *University of North Carolina at Charlotte, NC, USA*   **Jan 2015 – May 2018**

Master of Science, Mechanical Engineering | *University of North Carolina at Charlotte, NC, USA*   **Jan 2015 – Dec 2017**

Master of Science, Mechanical Engineering | *University of Sari, Sari, Iran*   **Oct 2010 – June 2013**

Bachelor of Science, Mechanical Engineering | *Ferdowsi University of Mashhad, Iran*   **Oct 2005 – June 2010**

PROFESSIONAL EXPERIENCE

Editorial Board Member | *Fire Science Models, Remote Sensing, and Data*| **Feb 2021 – Present**

Fire is an international, peer-reviewed, open access journal about the science, policy, and technology of fires and how they interact with communities and the environment.

- Review article submissions for journal
- Recruit appropriate colleagues to become reviewers /authors
- Propose novel research topics in the field

Lead Research Engineer | *Insurance Institute for Business & home safety* | Richburg, SC   **Aug 2022 –Present**

IBHS is a nonprofit funded by the insurance industry to perform research on natural disasters and deliver real-world solutions to mitigate the risk of natural catastrophes.

- Lead the planning and strategy for IBHS's wildfire research
- Establish and manage research collaborations between IBHS and other federal and private research institutions
- Design experiments, analyze data, and develop research reports

Research Engineer | *Insurance Institute for Business & home safety* | Richburg, SC   **Mar 2018 – Aug 2022**

- Employ machine vision and machine learning techniques to advance building resiliency science
- Identify & model the risks to structures from natural disasters and design experiments to find mitigation strategies
- Perform field studies and damage evaluation after wildfires and hurricanes
- Develop mathematical & statistical models based on research results
- Provide CAT modelers with data and technical support

Graduate Student Research Assistant | *UNCC* | Charlotte, NC   **June 2015 – Mar 2018**

Department of Fire Protection and mechanical engineering

- Develop skills in data analysis, statistical modeling & novel experimental design
- Publish academic articles in the field of wildfire
- Present research at academic conferences nationally and internationally
- Supervise and mentor undergraduate students

University Lecturer | *UNCC* | Charlotte, NC   **Aug 2017 – Dec 2017**

Department of Fire Protection

- Graduate level Fire Dynamics

TECHNICAL SKILLS[1]

Programing with Matlab and Python

- Ten years of experience using Matlab in various engineering applications
- Two years of exposure to programming with Python
- Holding several certificates from leading industries and academic institutes in this field including IBM, Mathworks, University of Toronto.
- Signal Processing, Machine Learning, and AI
- Developed several classifying and predictive models that is being used in real world applications including IBHS's iconic wall of fans
- 10 years of experience in signal processing, time series analysis, and spectral analysis

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[1] *Please visit my LinkedIn page for the full list of certificates and achievements*

- Holding several certificates from leading industries and academic institutes in this field including IBM, Google, Mathworks, ETH Zürich.

Image Processing and Machine Vision
- Developed several algorithms to address research questions in natural hazards including: tracking firebrands to identify their deposition location near structures, tracking hail stones to estimate their kinetic energy, detecting the damage on roof shingles after hail impacts, estimating the size and mass of firebrands.
- Holding several certificates from leading industries and academic institutes in this field including Mathworks, Northwestern University, University of Buffalo.

Miscellaneous
- Skilled in several engineering platforms such as: GIS mapping, Ansys, Maple, SolidWorks
- Skilled in developing and using Climate Change models, Risk models, Fire Spread and Fire Behavior models, CAT models

INTERPERSONAL AND LEADERSHIP SKILLS

Project Management
- Lead scientific projects and manage project risks to efficiently deliver the goal
- Holding several certificates from leading academic institutes in this field including UC Irvine, Macquarie University

Communications and Public Policy
- Present research to diverse global audiences, from city and state officials, to academics, to other researchers
- Holding several certificates from leading industries and academic institutes in this field including Rice University, University of Virginia, Macquarie University.

Leadership
- Several years of experience in leading diverse research teams on different projects
  - Supervise, support & mentor my students and interns throughout their careers

VOLUNTEER ACTIVITIES
- Editorial Board Member of Fire Science Data and Models section on Fire Journal (ISSN 2571-6255)
- Active reviewer (500+ times) of top engineering journals
- Member of the International Association of Fire Safety Science (IAFSS)
- Member of the National Fire Protection Association (NFPA)
- Member of the International Association of Wildland Fire (IAWF)
- Member of ASTM task group E05
- Member of the Institute of Electrical and Electronics Engineers (IEEE)
- Member of the International Society for Optics and Photonics (SPIE)
- Member of the UNC Charlotte's Orchestra of Diversity

AWARDS, HONORS, & OTHER QUALIFICATIONS
- Received IBHS recognized employee medal (July 2018)
- Received the Elsevier Recognized Reviewer award twice (August 2015 & March 2015)
- Accumulated over 850 citations & 25,000 downloads by other researchers (based on Google Scholar reporting)
- Awarded EB2 visa for Exceptional Ability in Conducting Research by Department of Homeland Security
- Ranked 1st in the 2000 Mathematics Olympiad in Khorasan Province, Iran
- Placed 1st in the Young Chess Players in Iran (1999)

SELECTED PUBLICATIONS[2]
1. **F. Hedayati**, S. Quarles, C. Alfano Evaluating Deck Fire Performance—Limitations of the Test Methods Currently Used in California's Building Codes, Fire, 5, 107, 2022.

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[2] *Please visit my Google Scholar page for the full (30+) list of publications*

2. **F. Hedayati,** et al. Data for firebrands generated from selected structural fuels, Joint Fire Science Program project (15-1-04-4), U.S. Department of Agriculture, Research Data Archive, 2020.
3. **F. Hedayati,** et al. A Framework to facilitate firebrand characterization, frontiers in mechanical engineering, wildland fire, volume 5, article 43, 2019.
4. **F. Hedayati,** Generation and Characterization of Firebrands from Selected Structural Fuels, Doctoral Dissertation, The University of North Carolina at Charlotte, 2018
5. **F. Hedayati**, C. Stansell et al. Near-Building Noncombustible Zone, IBHS technical report, 2018
6. **F. Hedayati**, W. Yang, A. Zhou, Effects of moisture content & heating condition on pyrolysis & combustion properties of structural fuels, Fire & Materials, 2018
7. **F. Hedayati**, G. Domairry, Nanoparticle migration effects on fully developed forced convection of TiO2-water nanofluid in a parallel plate microchannel, Particuology 2016, Vol. 24, 96-107.
8. **F. Hedayati**, G. Domairry, Effects of nanoparticle migration & asymmetric heating on mixed convection of TiO2-H2O nanofluid inside a vertical microchannel, Powder Technology 2015, Vol. 272: 250-259.
9. **F. Hedayati** et al., Fully developed forced convection of alumina/water nanofluid inside microchannels with asymmetric heating, Powder Technology 2015, Vol. 269: 520-531.
10. **F. Hedayati**, A. Malvandi, D. D. Ganji, Second-law analysis of fluid flow over an isothermal moving wedge, Alexandria Engineering Journal 2014, Vol. 53(1), 1-9.
11. J. Kadel, **F. Hedayati**, S. Quarles, A. Zhou, Effect of Environmental Conditions on the Dehydration and Performance of Fire-Protective Gels, Fire Technology, 2020
12. B. Bahrani, **F. Hedayati,** et al. Data for firebrands generated from selected vegitatve fuels, Joint Fire Science Program project (15-1-04-4), U.S. Department of Agriculture, Research Data Archive, 2020.
13. A. Malvandi, **F. Hedayati**, D. D. Ganji, Onset of the Mutual Thermal Effects of Solid Body and Nanofluid Flow over a Flat Plate Theoretical Study, Journal of Applied Fluid Mechanics 2015, Vol. 8(4).
14. A. Malvandi, **F. Hedayati**, D. D. Ganji, Slip effects on unsteady stagnation point flow of Nanofluid over a stretching sheet, Power Technology 2014, Vol. 253, 377-384.
15. A. Maranghides, S Nazare, **F. Hedayati** et al., Structure Separation Experiments: Shed Burns without Wind, NIST Technical Note 2235.
16. A. Malvandi, S. A. Moshizi, **F. Hedayati**, G. Domairry, An analytical study of unsteady motion of non-spherical particle in plane of couette flow, Journal of Molecular Liquids 2014, Vol. 199, 408-414.
17. A. Malvandi, A. Ghasemi, R. Nikbakhti, A. Ghasemi, **F. Hedayati**, Modeling and parallel computation of the non-linear interaction of rigid bodies with incompressible multi-phase flow, Computers & Mathematics with Applications 2016, Vol. 72(4), 1055-1065.
18. A Maranghides et al. (including **F. Hedayati**), Structure Separation Experiments Phase 1 Preliminary Test Plan, NIST Technical Note 2161.