

Hoda Hallaji

Ph.D. Student in Environmental Engineering

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Sid and Reva Dewberry Department of Civil, Environmental and Infrastructure Engineering

Volgenau School of Engineering, George Mason University, Fairfax, VA 22030

Academic History

- **Doctor of Philosophy** (August 2023 to Present)

George Mason University

Field of study: Environmental Engineering (Graduate Research Assistant (GRA))

- **Master of Science** (September 2011 to November 2013)

University of Tehran

Field of study: Chemical Engineering - Separation Processes Design

Master thesis: Construction and characterization of ZnO nanofiber by electrospinning and adsorption of contaminants from wastewater

- **Bachelor of Science** (September 2006 to September 2010)

Shahid Bahonar University of Kerman

Field of study: Chemical Engineering

Bachelor thesis: Application of MATLAB software in chemical engineering

Research Interests

- Air pollution dispersion modeling
 - Environmental impact monitoring and assessment
 - Air quality assessment
 - Environmental policy
 - Wastewater treatment processes
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Work Experiences

- **Graduate Research Assistant** (Civil, Environmental and Infrastructure Engineering Department, George Mason University – August 2023 to Present)

Working on an **NIH-funded project focused on simulating neighborhood-scale air quality by integrating CMAQ with WRF and SMOKE over the Washington D.C. metropolitan area**. Key responsibilities include:

- ✓ Fine-scale air quality modeling using EPA's CMAQ v5.4+
- ✓ Nested domain setup with 12 km² (US), 4 km² (Eastern US), and 1 km² (Washington D.C.) resolutions

- ✓ Meteorological data processing using the WRF model
 - ✓ Emissions data processing using the SMOKE model with NEI2017 and NEMO datasets
 - ✓ Providing policy support by evaluating vehicular and industrial emissions and contributing to urban health and equity outcomes
- **Researcher** (Azad University of Mahshahr – January 2014 to May 2023)
After ending my education, I joined Prof. Peyghambarzadeh’s research group and we did several projects in collaboration with each other entitled:
 - ✓ Investigating heat transfer enhancement for cooling purposes
 - ✓ Evaluation of fouling mitigation methods
 - ✓ Air pollution dispersion modeling and its environmental impact assessment
 - **Lecturer** (Azad University of Mahshahr - September 2018 to May 2023)
I have been teaching chemical engineering courses as following:
 - ✓ Air pollution dispersion modeling using AERMOD software
 - ✓ Introduction of environmental engineering systems
 - ✓ Heat and Mass Transfer
 - ✓ Thermodynamic

Publications

Journal papers:

1. Hoda Hallaji, M.R. Bohloul, S.M. Peyghambarzadeh and Shima Azizi, “Measurement of air pollutants concentrations and dispersion modeling by AERMOD coupled with WRF model”, International Journal of Environmental Science and Technology (2023 May 7:1-20).
2. Hoda Hallaji, S.M. Peyghambarzadeh, M.R. Bohloul and Shima Azizi, “The optimum conditions for calcium sulfate fouling rate under subcooled flow boiling using Taguchi method”, International Journal of Heat and Mass Transfer 204 (2023): 123859.
3. Peyghambarzadeh, S. M., H. Hallaji, M. R. Bohloul, and N. Aslanzadeh. "Heat transfer and Marangoni flow in a circular heat pipe using self-rewetting fluids." Experimental Heat Transfer 30, no. 3 (2017): 218-234.
4. Hoda Hallaji, Ali Reza Keshtkar, and Mohammad Ali Moosavian. "A novel electrospun PVA/ZnO nanofiber adsorbent for U (VI), Cu (II) and Ni (II) removal from aqueous solution." Journal of the Taiwan Institute of Chemical Engineers 46 (2015): 109-118.

Conference Papers:

1. Hoda Hallaji, Lucas RF Henneman, "Simulation of Neighborhood-Scale Air Quality by integrating CMAQ with WRF and SMOKE Over the Washington D.C. Metropolitan Area", Accepted for 23rd Annual Community Modeling and Analysis System (the 2024 CMAS) Conference, University of North Carolina, Chapel Hill, NC, US, 21-23 October 2024,
2. Hoda Hallaji, Alir Reza Keshtkar, Mohammad Ali Moosavian, "Removal of copper Ions from Aqueous Solutions Using Mesoporous PVA/ZnO Composite Nanofiber", Accepted for 5th International Congress on Nanoscience & Nanotechnology (ICNN2014), Tehran, Iran, 22-24 October 2014.
3. Hoda Hallaji, Ali Reza Keshtkar, Mohamad Ali Moosavian; "Effect of ZnO content on polyvinyl alcohol/zinc oxide nanofiber adsorbent for removal of heavy metals from aqueous solution", Accepted for 8th International Chemical Engineering Congress and Exhibition (IChEC 2014), Kish, Iran, 24-27 Feb 2014.

Computer Skills

- Environmental Engineering software: CMAQ, SMOKE, WRF, VERDI, AERMOD, AERMET, AERMAP, Qualitek
- General software: Microsoft Office (Word, Excel, Power point, Visio)
- Programming languages: Python

Honors and Awards

- Received certificate from Community Modeling and Analysis System (CMAS), the University of North Carolina (UNC) due to successful complete the SMOKE online training, 2024.
- Received certificate from Community Modeling and Analysis System (CMAS), the University of North Carolina (UNC) due to successful complete the CMAQ online training, 2023.
- Ranked top 5% among students of the cohort of chemical engineering graduates at the university of Tehran, 2013.
- Received certificate from CHEE department of university of Tehran due to successful complete the workshop of "Computational Fluid Dynamic", 2012.
- Ranked 72nd among nearly ten thousand participants in the Master of Science nationwide university entrance exam (konkooor), February 2011.
- Ranked top 10% among all students of chemical engineering at Shahid Bahonar university of Kerman, 2010.