Stephanie F. Pilkington, Ph.D.

spilking@uncc.edu
704-687-5038

Education

| Colorado State University	Colorado State University	Virginia Tech
Doctorate of Philosophy	**Masters of Science**	**Bachelor of Science**
Civil & Environmental Engineering	**Civil & Environmental Engineering**	**Civil & Environmental Engineering**
Focus: Structural Engineering	**Focus: Structural Engineering**	**Cum Laude**
August 2019	May 2015	May 2010
Dissertation: *Integration of Graphical, Physics-Based, and Machine Learning Methods for Assessment of Impact and Recovery of the Built Environment from Wind Hazards*	**Thesis:** *Hurricane Impact Predication Ranking System using Artificial Neural Networks* **Advisor (Masters & Ph.D.):** Dr. Hussam N. Mahmoud	**Undergraduate Research:** Virginia Tech Storm Chase Team, Great Plains (Tornado Alley), May 2010

Publications

Journals

1. *(Under Review)* Pilkington, S. F. & Mahmoud, H. N. (2019) Interpreting the Black Box of a Wind Damage-Artificial Neural Network Model using Graph Theory. *Nature - Machine Intelligence.*

2. *(Under Review)* Aghababaei, Koliou, M., Pilkington, S. F., Mahmoud, H., van de Lindt, J. W., Curtis, A., Smith, S., Ajayakumar, J., Watson, M. (2019). Validation of Time-Dependent Repair Recovery of the Building Stock following the 2011 Joplin Tornado. *Natural Hazards Review Special Issue on Enabling Resilient and Sustainable Communities*

3. *(Under Review)* Pilkington, S. F., Curtis, A., Mahmoud, H. N., van de Lindt, Smith, S., Ajayakumar, J. (2019). Documented Recovery Patterns and Observations from Video Cataloged Data of the 2011 Joplin Tornado. *Natural Hazards Review Special Issue on Enabling Resilient and Sustainable Communities*

4. *(In-Press)* Pilkington, S. F., Mahmoud, H. N., van de Lindt, J. W., Koliou, M., Smith, S. (2019). Hindcasting Loss and Evaluating Track Implications of Track Location for the 2011 Joplin, MO Tornado. *Journal of Risk and Uncertainty in Engineering Systems*

5. *(In-Press)* Pilkington, S. F., & Mahmoud, H. N. (2019). Concluding the 2017 Hurricane Season: An Evaluation of Impact Level Forecasts with Varied Meteorological Hazards. *Natural Hazards Review Special Collection: The 2017 Disasters, Sociotechnical Perspectives*

6. Memari, M., Attary, N., Masoomi, H., Mahmoud, H., van de Lindt, J. W., Pilkington, S. F., & Ameri, M. R. (2018). Minimal building fragility portfolio for damage assessment of communities subjected to Tornadoes. *J. Struct. Eng.*, *144*(7). http://doi.org/10.1061/(ASCE)ST.1943-541X.0002047

7. Pilkington, S.F., & Mahmoud, H. (2017). Spatial and temporal variations in resilience to tropical cyclones along the United States coastline as determined by the multi-hazard hurricane impact level model. *Palgrave Communications - Nature*, *3*(1), 14. http://doi.org/10.1057/s41599-017-0016-1. Available at: https://www.nature.com/articles/s41599-017-0016-1

8. Pilkington S.F., Mahmoud H.N. (2017) Real-time application of the multi-hazard hurricane impact level model for the Atlantic Basin. *Front Built Environ Wind Eng Sci.* DOI: 10.3389/fbuil.2017.00067. Available at: https://www.frontiersin.org/articles/10.3389/fbuil.2017.00067/abstract

9. Pilkington, S. F., & Mahmoud, H. N. (2016). Using Artificial Neural Networks to Forecast Economic Impact of Multi-Hazard Hurricane-Based Events. *Journal of Sustainable and Resilient Infrastructure*, *1*(1). http://doi.org/10.108023789689.2016.1179529
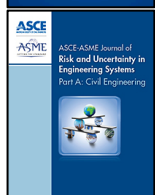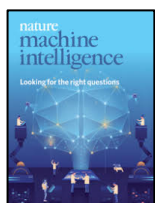
Publications Cont.

Conference Proceedings

10. Baker, D. Gorakhki, M., Pilkington, S. F. (2019). Using Legos to Facilitate Active Learning in Engineering Dynamics. *American Society for Engineering Education. ASEE Annual Conference Proceedings*, June 16, 2019, Tampa, FL

11. van de Lindt, J. W., Mahmoud, H., Pilkington, S. F., Koliou, M., Attary, N., Cutler, H., Smith, S., Rosenheim, N., Navarro, C. M., Kim, Y. W., Lee, J. S. (2019). Validating Interdependent Community Resilience Modeling using Hindcasting. *13th International Conference on Applications of statistics and Probability in Civil Engineering*, May 26 – 30, 2019, Seoul, South Korea.

12. van de Lindt, J. W., Attary, N., Mahmoud, H. N., Pilkington, S. F., Koliou, M., Cutler, H., Zahran, S. Peacock, W. G., Rosenheim, N., Navarro, C. M., Kim, Y. W., Lee, J. S. (2018). Hindcasting Validation of Resilience Computational Environment Architecture: Community Level Damage Assessment following the 2011 Joplin, Missouri Tornado. *Proceedings of the 6th International Symposium on Reliability Engineering and Risk Management,* May 31 - June 1, 2018, Singapore.

Conferences & Workshops

Invited Presenter by the Office of CSU events and **Donor Engagement** to create an interactive for donors involving our Hurricane Impact Ranking System Model, 1870 Dinner, February 2018

"Evaluating the socio-technical interactions contributing to wind damage in an artificial neural network model". *Tornado Hazard Wind Assessment and ReducTions Symposium*, October 2019

"A Holistic Approach for Hindcasting the Recovery of the 2011 Joplin Tornado". *Tornado Hazard Wind Assessment and ReducTions Symposium*, September 2018

Moderator for Student Lightning Presentations Technical Session. *Tornado Hazard Wind Assessment and ReducTions Symposium*, September 2018

"Concluding the 2017 Hurricane Season: An Evaluation of Impact Level Forecasts with Varied Meteorological Hazards." *Infrastructure Resilience Division Research Forum*, July 2018

Co-Presenter: "Using Legos for In-class Interactive Learning." *The Institute for Learning and Teaching at Colorado State University 2017 Summer Conference*, May 2017

"A New Hurricane Impact Level Ranking System: A Multivariable Approach to Forecasting Loss and Communicating Risk to the Public Using Artificial Neural Networks." *GeoStructures Congress*, February 2016

"The Hurricane Impact Ranking System Model." *Front Range Tropical Cyclone Workshop*, October 2016

"A New Hurricane Impact Level Ranking System: A Multivariable Approach to Forecasting Loss Using Artificial Neural Networks for Communicating Risk to the Public." *American Meteorological Society Annual Meeting*, Jan. 2016

Media Coverage & Exposure

Even 'weak' hurricane can cause a lot of harm

http://www.cnn.com/2019/07/16/opinions/hurricane-season-barry-strength-pilkington-mahmoud/index.html

Beyond Wind Speed: A New Measure for Predicting Hurricane Impacts - https://engr.source.colostate.edu/beyond-wind-speed-new-measure-predicting-hurricane-impacts/ **(also covered by CBS Denver; UN Office for Disaster Risk Reduction (UNISDR); Environmental News Network; PHYS.ORG; Science Daily; Science Newsline – Nature & Earth)**

Researchers look at new scale for destructive power of hurricanes, not based just on wind speed - http://www.theadvocate.com/baton_rouge/news/environment/article_13e4b4e8-dba0-11e7-b19a-db5cbb943c04.html

Podcast Guest
An Alternative Way to Classify Hurricanes
https://youtu.be/4zA8HdJsTm0

Podcast Guest
The True Measure of Hurricanes
https://weloveweather.tv/episode-59/

Stephanie F. Pilkington, Ph.D.

spilking@uncc.edu
704-687-5038

Work Experience

August 2019 – Present

University of North Carolina at Charlotte, Charlotte, NC
Title: Assistant Professor, Department of Engineering Technology and Construction Management
- New Faculty as of Fall 2019
- Establishing natural hazards research within the William States Lee College of Engineering through collaborations with North Carolina Department of Public Safety, UNCC Energy Production & Infrastructure Center, and other colleges and universities.
- NSF Enabling Project Fellow (Natural Hazards Center)

July 2015 – August 2019

Colorado State University, Fort Collins, CO
Title: Graduate Research Assistant, Civil Engineer
- Research Projects:
  - Machine Learning Model for Impact and Recovery of Community Building Stock from Wind Hazards
  - Joplin, MO Hindcast of 2011 Tornado (**NIST Center of Excellence**)
  - Mitre Gate Pintle Socket Experimental Testing (**U.S. Army Corps of Engineers**)
- Interact with university donors and alumni concerning research work conducted within the College of Engineering and the Department of Civil & Environmental Engineering.
- Participate in outreach for new and prospective students.
- Review manuscript draft for *Weather and Forecasting* (an American Meteorological Society Journal).

August 2013 – June 2015

Colorado State University, Fort Collins, CO
Title: Graduate Research Assistant, Civil Engineer.
- Hurricane Impact Level Model Development
  - Determine and gather relevant historical data from both the National Hurricane Center and U.S. Census Bureau in order to establish a large enough reference set for ANN pattern recognition programming.
  - Self-taught ANN programming and variations using MATLAB as well as GIS analysis.
  - Created the new Hurricane Impact Level Ranking System and Model in association with self-designed ANN model, which accounts for multiple variables in a hurricane event in order to provide a forecasted level of economic damage and impact real-time during impending U.S. hurricane events.

August 2014 – December 2014

Colorado State University, Fort Collins, CO
Title: Teaching Assistant, Grader.
- Responsible for assignment grading for undergraduate course CIVE 302 – Civil Engineering Materials.
- Establish grading scale for weekly assignments.

July 2012 – August 2013

United States Air Force, Hanscom Air Force Base (AFB), MA
Title: Restoration Program Manager, Environmental Engineer (Federal Job: GS-0819-11).
- Manage and provide oversight of restoration contractors and their work. Reviewed contract proposals and assisted in transition from the Cost-Plus contract to new Performance Based Restoration Fixed Price Contract.
- Act as main point of contact for Hanscom AFB for contractors, regulators, Air Force Material Command, Air Force Civil Engineer Center, and property owners where remedial work needs to be done off base.
- Executed project cost estimations for Fiscal Year (FY) 2014 Program Requirements Development.
- Compile analytical data for the Base's groundwater treatment plant and vacuum enhanced recovery system in order to track effectiveness of treatment for contaminated groundwater.

July 2010 – July 2012

United States Air Force, Joint Base Andrews, MD
Title: Environmental Engineer (Federal Job: GS-0819-09).
- Manage the base wastewater discharge permit program, including oversight of the base's wastewater sampling contract.
- Provide briefings independently, and above position level, on civil engineering's role and environmental issues to Air Staff, The 11th Wing Base Commander, facility managers, and various others on a regular basis.
- Provide assistance and succinctly review contract submittal documents in the areas of water quality management, hazardous waste, fuel tank management, natural resources, and environmental restoration. Comments provided were used as guidelines on how to review other Quality Assurance Performance Plans for environmental restoration.
- Inventoried base stormwater best practice methods in order to incorporate stormwater infrastructure into real estate as part of an US Air Force wide initiative.

Stephanie F. Pilkington, Ph.D.

spilking@uncc.edu
704-687-5038

Courses Taught

August 2019 – Present

University of North Carolina at Charlotte, Charlotte, NC
Title: Assistant Professor
- CMET 3224 – Construction Project Admin.
- ETCE 1222 – Construction Materials
- ETCE 3163 – Structural Analysis and Design I

August 2015 – May 2016 and August 2016 – May 2017

Colorado State University, Fort Collins, CO
Title: Graduate Teaching Fellow & Graduate Teaching Assistant
- CIVE 260 – Engineering Mechanics: Statics
- CIVE 261 - Engineering Mechanics: Dynamics
- CIVE 102 – Introduction to Civil Engineering: Labs in surveying and Excel (*GTA*)
- CIVE 103 – Engineering Graphics and Computing: Labs in AutoCAD and Excel (*GTA*)

Leadership, Involvement, and Outreach

As of July 2018

Contributor, ASCE Infrastructure Resilience Division – Resilience Products
- Involved in discussions on developing educational products for ASCE members concerning community resilience.
- Plan and budget for introductory educational podcasts on resilience.

November 2015 – November 2017

Chair, Student Leadership Committee, NIST Center for Risk-Based Community Resilience Planning
- Establish & initiate graduate student and post-doctoral fellow involvement across multiple universities as part of the NIST Center of Excellence.
- Act as correspondent for all students and post-docs involved in the NIST Center of Excellence.
- Organize student poster competition to showcase students' work with coordination of judging from industry and NIST professionals.

Fall 2017 & Spring 2018

Volunteer: Panelist, Rocky Mountain High School Career Xpo, Fort Collins
- Contribute to outreach for engineering career fields.
- Serve as panelist to be asked questions concerning a career in civil engineering.

Fall 2017 & Spring 2018

Volunteer: Math Tutor, Lincoln Junior High, Fort Collins
- Assist middle school math students in understanding principle math concepts.
- Serve as an additional resource for students.

Spring 2016

Volunteer: Panel Judge, DSST Stapleton School, Denver, Senior Projects
- Served on judging panel for senior projects in the subjects of education as well as engineering and automotive.
- Evaluate project quality and student knowledge.
- Provide input and feedback to high school seniors.
- Evaluation went towards the students' overall final grade.

Fall 2015 & Spring 2016

Volunteer: SMASH Lab Demonstration, Engineering Expo
- Participate in outreach for Colorado State University Engineering Open House.
- Simulate structural demonstrations for high school students exploring universities and majors.

Awards and Scholarships

- **National Science Foundation Sponsored Enabling Fellowship**, awarded 2020 through the National Hazards Center
- **College of Engineering Graduate Teaching Fellowship**, awarded Fall 2017 (through Spring 2018)
- **Jack E. Cermak Wind Engineering Graduate Fellowship,** awarded Fall 2016
- **Second Place, NIST COE Student Poster Competition**, Spring 2016
- **Kenneth G. Medearis Scholarship,** awarded Fall 2014
- **US Air Force 66th Air Base Group Commander Coin,** awarded in 2012 for an exemplary presentation to the current Major Command Colonel
- **US Air Force 11th Wing Commander Coin,** awarded in 2011 for successful coordination and leadership for an event involving the Undersecretary of the Air Force and Congresswoman Edwards of Maryland.

Stephanie F. Pilkington, Ph.D.

spilking@uncc.edu
704-687-5038

Job Related Training & Certifications

- IRB Training for Natural Disaster Field Studies
- Active learning and inclusion training as part of graduate teaching fellowship
- Voted best presenter during Writing for National Environmental Policy Act (NEPA) Specialists course in Dec 2011.
- Trained in Air Force Emergency Response Operations (Unit Control Center member), Nov 2011. Equivalent to Federal Emergency Management Agency (FEMA) IS-100, 200, 700, 775, and 800 courses.
- Passed the Fundamentals of Engineering (FE) Exam in April 2010.

Technical Skills

Skill	Level (Average → Good → Skilled)		Skill	Level (Average → Good → Skilled)
MATLAB	Skilled		SAP 2000	Average
Python	Average		Abaqus	Average
QGIS	Good		Mac OsX	Skilled
ArcGIS	Good		Windows	Skilled
IN-CORE	Good		Microsoft Office	Skilled
AutoCAD Civil 3D	Good/Skilled		Technical Teaching	Skilled

Long Standing Member of

American Society of Civil Engineers
American Meteorological Society
Society of Women Engineers
National Weather Service Skywarn Spotter