

# Zhonghua Zheng

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**Education**


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<b>University of Illinois at Urbana-Champaign (UIUC), U.S.</b>	Expected 2020
<i>Ph.D. in Environmental Engineering</i> (Program Ranking: No. 3 in U.S. News 2019)	GPA: 3.89/4.00
<i>Concentration (Ph.D. level): Computational Science and Engineering (CSE)</i>	01/2017 -
-Research interests: Computational Simulation of Aerosol Behavior, Air Quality, and Machine Learning	
-Advisor: Prof. Nicole Riemer	
<b>University of Illinois at Urbana-Champaign (UIUC), U.S.</b>	12/2016
<i>M.S. in Agricultural and Biological Engineering (ABE)</i>	GPA: 3.81/4.00
-Thesis: Impedance-based moisture content sensor assessment for gas-phase biofilters	
-Advisor: Prof. Xinlei Wang	
-Committee members: Prof. Richard S. Gates, and Prof. Liangcheng Yang (Illinois State University)	
<b>Zhejiang University (ZJU), China</b>	06/2015
<i>B.Eng. in Biosystems Engineering</i> (Program Ranking: Top 2 in China)	GPA: 3.69/4.00
-Thesis: Investigation on the bactericidal efficacy of atomized slightly acidic electrolyzed water	
-Advisor: Prof. Zhangying Ye	
<b>University of Manchester, UK</b>	02/2013
<i>Student in University Language Centre (01/2013-02/2013)</i>	

**Employments**


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<b>Bayer (Crop Science Division)</b>	09/2018 - 12/2018
<b>The Climate Corporation</b>	
<b>Data Scientist Intern</b>	
<b>Department of Computer Science (CS) at UIUC</b>	08/2018 - 12/2018
<b>Graduate Assistant</b>	
Duties: Clerical Support, Technical/Support Services.	
<b>Oak Ridge National Laboratory</b>	05/2018 - 08/2018
<b>ORISE Ph.D. Intern/Researcher at ORNL</b>	
Affiliation: National Center for Computational Sciences - Advanced Data and Workflow Group	
Themes: Deep Learning, Computational Science and Engineering, Big Data	
<b>Monsanto Company</b>	01/2018 - 05/2018
<b>The Climate Corporation</b> (Project Sponsor)	
<b>Data Scientist-UIUC Innovation Center</b>	
Affiliation (Monsanto Company): GLB Breeding - Analytics & Pipeline Design	
Affiliation (The Climate Corporation): Science - Measurements	
Project: <i>Machine Learning Approaches to SmartFirmer Anomaly Detection</i>	
Skills: Machine Learning, Spatiotemporal Analysis, Big Data	
Achievements: Got the summer intern (05/2018 - 08/2018) offer, Gave two oral presentations for team	
Mentor: Dr. Michael H. Malone	

## Certificates

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### Data Science

- [Data Scientist in Python](#), issued by DATAQUEST 05/2018 -

### Machine Learning and Deep Learning (deeplearning.ai)

- [Machine Learning](#) by Stanford University on Coursera 01/2018 -
- [Deep Learning Specialization](#) 06/2018 -
- Neural Networks and Deep Learning 05/2018 -
- Improving Deep Neural Networks: Hyperparameter tuning, Regularization and Optimization 05/2018 -
- Structuring Machine Learning Projects 05/2018 -
- Convolutional Neural Networks 06/2018 -
- Sequence Models 06/2018 -

### Environmental Engineering

- [Fundamental Engineer \(FE\)](#) in Environmental Engineering, issued by NCEES 06/2017 -

## Awards/Honors

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- ✓ Finalist, [SMOKY MOUNTAIN Computational Sciences and Engineering Conference \(SMC\) Data Challenge](#) 08/2018
  - ✓ [Frist Place, Student Paper Award](#), Association of Overseas Chinese Agricultural, Biological, and Food Engineers (AOCABFE) 07/2016
  - ✓ Conference Travel Awards for Graduate Students, Graduate College, UIUC 10/2017
  - ✓ Racheff Graduate Student Travel Award, Department of CEE, UIUC 10/2017
  - ✓ ABE Student Travel Grant, Department of ABE, UIUC 03/2016
  - ✓ Tau Beta Pi (Engineering Honor Society) Inducted 2016
  - ✓ Alpha Epsilon (Agricultural Engineering Honor Society) Inducted 2015
  - ✓ Excellent Student, ZJU, China 11/2014
  - ✓ Scholarship for Academic Excellence, ZJU, China 11/2014

## Research Experience

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### Graduate Student Researcher

01/2018 - Present

Department of Civil and Environmental Engineering & Department of Atmospheric Science (ATMS) at UIUC  
 Atmospheric Science & Machine Learning (Mentor & Ph.D. Advisor: Prof. Nicole Riemer)

- Leverage Deep Learning frameworks to predict the global distribution of aerosol mixing state metrics.
- Build a Neural Network in TensorFlow to fit regression and classification models.

**Graduate Research Assistant**

08/2016 - 12/2017

Department of Civil and Environmental Engineering at UIUC

Air Quality Modeling (Mentors: Prof. Mark J. Rood and Dr. Sotiria Koloutsou-Vakakis)

- Collaborated with the researchers from the CyberGIS Center for Advanced Digital and Spatial Studies (CyberGIS Center), National Center for Supercomputing Applications (NCSA)
- Attended the professional conference and presented the poster

**Graduate Student Researcher**

08/2014 - 08/2016

Department of Agricultural and Biological Engineering at UIUC

Environmental Control (Mentors: Prof. Xinlei Wang &amp; Prof. Liangcheng Yang)

- Developed an impedance-based sensor to monitor moisture of biofilter media in different conditions
- Attended the professional conference and gave oral presentation

**Undergraduate Summer Research Intern**

07/2013 - 08/2013

Department of Agricultural and Biological Engineering at UIUC

Indoor Air Quality (Mentors: Prof. Xinlei Wang &amp; Dr. Liangcheng Yang)

- International Summer Immersion Program (ISIP), College of Agricultural Consumer and Environmental Sciences (ACES)
- Completed an independent project titled "*Indoor air quality case study: particle size distribution in a campus building*" and presented the poster

**Teaching Experience****Graduate Student Co-Instructor**

07/2016 &amp; 07/2017

Girls' Adventures in Math, Engineering, and Science (GAMES) summer camp for high-school female students, UIUC

- Taught Visualization of Environmental Data with ArcGIS.

**Graduate Grader**

09/2015 - 12/2015

Department of Agricultural and Biological Engineering at UIUC

Grader of TSM 372 - *Environmental Control & HVAC Systems* (TSM 372) with 30 students

- Grade assignments, lab reports, class quizzes and exams
- Assist with classroom and lab activities

**Mentoring Experience**

[4] Yilan Cheng (B.S., 2019, expected, Civil Engineering, UIUC)

06/2017 - 08/2017

Research Experiences for Undergraduates

[3] Yuchen He (B.S., 2017, M.S., 2018, Computer Science, UIUC)

08/2016 - 05/2017

## Research Experiences for Undergraduates

- [2] **Jing Wu (B.A., 2017, M.S, 2020, Agricultural Resources and Environment, ZJU)** 07/2016 - 08/2016  
International Summer Immersion Program
- [1] **Ciju Francis (B.S., 2015, Electrical Engineering, UIUC)** 02/2015 - 05/2015  
ABE 397 - Independent Study

**Completed Research Projects**

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- Evaluation of WRF Parameterizations for Air Quality Applications* 08/2016 - 12/2017
- Simulated meteorological parameters using Weather Research and Forecasting (WRF) model.
  - Utilized NCL/Python and CyberGIS-Jupyter framework for geospatial analytics.
- Impedance-based moisture content sensor assessment for gas-phase biofilters* 12/2014 - 08/2016
- Determined the effects of different size distribution and nitrogen concentration of biofilter media on media impedance by conducting impedance-based sensor tests and analytical chemistry experiments.
  - Developed mathematical and statistical models for estimating moisture contents of biofilter media, where the moisture contents are the functions of sensor reading and nitrogen concentration.
- Identifying ammonia source and sink profiles within a corn canopy in central Illinois using inverse Lagrangian dispersion analysis (CEE independent study)* 08/2015 - 12/2015
- Developed code to perform Inverse Lagrangian modeling for estimating fluxes of ammonia in corn canopy.
  - Analyzed the vertical in-canopy ammonia source/sink profile from the in-canopy vertical profile of ammonia concentration using Inverse Lagrangian method.
- Developed a portable fogging device for disinfection with Slightly Acidic Electrolyzed Water (granted by Ministry of Education of China)* 04/2013 - 06/2014
- Served as a Principal Investigator for a project of National Undergraduate Training Programs for Innovation (\$2,000).
  - Designed the equipment planning diagrams, prototype and tested the efficacy of sterilization.
  - Evaluated the optimal parameters of device such as electrode spacing for maximum Available Chlorine Concentration (ACC) generation.
- [2014 ASABE/CSBE Robotics Student Design](#) 03/2014 - 07/2014
- Used Arduino to develop a syrup collecting robotics prototype based on machine vision.
  - Implemented SolidWorks and CAD system to design and 3D print robotics component (end-effectors, spooling, and traveling devices).
- Effects of atomized Slightly Acidic Electrolyzed Water on Sterilization effect and PM2.5 concentration in the air* 03/2013 - 06/2014
- Served as a Principal Investigator for a Zhejiang University Student Research Training Program (\$500).
  - Conducted simulated field trial and quantitative germicidal by using *E.Coli* (ATCC 25922).
  - Operated the Six-Stage Andersen Cascade Impactor to collect the microorganism sample and measure the PM2.5 with TSI 8530 in the field trial.

## Research Products

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### (First Author)

#### Peer-reviewed Journals

- [2] Zheng, Z., Yang, L., Gates, R. S., Wu, J., & Wang, X. (2017). **Impedance-based moisture content sensor assessment for gas-phase biofilter media**. *Transactions of the ASABE*, 60(5), 2163-2173. doi: 10.13031/trans.12335.
- [1] Zheng, Z., Lin, X., Zhu, S., He, J., Cao, Y., & Ye, Z. (2016). **Investigation on the bactericidal efficacy of atomized slightly acidic electrolyzed water**. *Chinese Journal of Disinfection*, 33(4), 312-317. doi: 10.11726/j.issn.1001-7658.2016.04.004 (Peer-viewed, In Chinese)

#### Thesis

- [1] Zheng, Z. (2016). **Impedance-based moisture content sensor assessment for gas-phase biofilters**. Master thesis, Department of Agricultural and Biological Engineering, University of Illinois at Urbana-Champaign.

#### Conference Proceedings

- [1] Zheng, Z., Yang, L., & Wang, X. (2016). **Monitoring moisture content of gas-phase biofilter based on impedance under different conditions**. In *2016 ASABE Annual International Meeting, No. 162461021* (pp. 14). American Society of Agricultural and Biological Engineers. doi:10.13031/aim.20162461021.

### (Participant)

#### Peer-reviewed Journals

- [1] Fu, K., Zheng, Z., Balasubramanian, S., Yin, D., Koloutsou-Vakakis, S., McFarland, D. M., Wang, S., & Rood, M. J. (2018). **WRF Parameterization for Air Quality Applications over the Midwest USA** (In preparation)

## Presentations

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### Oral

- [3] Zheng, Z. (2017). **Impedance-based moisture content sensor assessment for gas-phase biofilters**. Oral Presentation in *CEE 595 AG Seminar*, Environmental Engineering and Science Program Seminar at UIUC, Urbana, IL., April 20.
- [2] Zheng, Z. (2016). **Monitoring moisture content of gas-phase biofilter based on impedance under different conditions**. Oral Presentation in *M.S. Thesis Final Defense*, Department of Agricultural and Biological Engineering at UIUC, Urbana, IL., August 26.
- [1] Zheng, Z., Yang, L., & Wang, X. (2016). **Monitoring moisture content of gas-phase biofilter based on impedance under different conditions**. Oral Presentation in *2016 ASABE Annual International Meeting*, American Society of Agricultural and Biological Engineers, Orlando, FL., July 20.

### Poster

- [2] Zheng, Z. & Riemer, N. (2018). **Global Aerosol Mixing State Metrics Distribution Assessment: Artificial Neural Network (ANN) Approaches**. Poster Presentation in 24th Annual Environmental Engineering & Science Symposium at UIUC, Champaign, IL., April 13.
- [1] Zheng, Z., Fu, K., Balasubramanian, S., Koloutsou-Vakakis, S., McFarland, D. M., & Rood, M. J. (2017). **Evaluation of WRF Parameterizations for Air Quality Applications over the Midwest USA**. Poster Presentation in *2017 AGU Fall Meeting*, American Geophysical Union, New Orleans, LA., December 14.

## Services

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**2015 - 2016**

Executive Board & Activity Director, Student Activity Committee (SAC), Association of Overseas Chinese Agricultural Biological Food Engineers (AOCABFE)

## Professional Activities

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**2018 -**

Student Member of American Association for Aerosol Research (AAAR)  
Student Member of American Meteorological Society (AMS)

**2017 -**

Student Member of Chinese-American Professors in Environmental Engineering and Science (CAPEES)

**2016 -**

Student Member of Air & Waste Management Association (A&WMA)  
Student Member of American Geophysical Union (AGU)  
Student Member of Association of Environmental Engineering and Science Professors (AEESP)

**2015 -**

Student Member of Association of Overseas Chinese Agricultural Biological Food Engineers (AOCABFE)

**2016 - 2018**

Student Member of American Chemical Society (ACS)

**2015 - 2016**

Student Member of American Society of Agricultural and Biological Engineers (ASABE)

## Other Outreach Activities

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**2018 -**

Member of The Association of Wenzhou Ph.D.s – U.S.A.

## Skills

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**Data Analysis & Statistics:** Python + R + Jupyter Notebook, Machine learning, SPSS, Origin

**Machine Learning & Deep Learning:** TensorFlow

**Spatiotemporal Analysis:** CyberGIS, ArcGIS

**Programming:** Bash, MATLAB/GNU Octave, SQL, C + OpenMP + MPI, JAVA

**Optimization:** GAMS

**Others:** ANSYS, SolidWorks, AutoCAD, LaTeX, Markdown, MS office

**Graduate Coursework**

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***Science***

ATMS 420, Atmospheric Chemistry

A+

***Data Analytics and Technology***

STAT 542 / CSE 542, Statistical Learning

A+

STAT 420, Methods of Applied Statistics

A+

GEOG 480, Principles of GIS (Geographic Information System)

ABE 425, Engineering Measurement Systems

CS 420 / CSE 402, Parallel Programming for Scientists and Engineers

STAT 530, Bioinformatics

***Environmental Engineering***

CEE 545, Aerosol Sampling and Analysis

A+

CEE 546, Air Quality Control

CEE 599, Independent Research (4 Credit Hours, during M.S. studies in ABE)

CEE 442, Environmental Engineering Principles, Physical

CEE 446, Air Quality Engineering

CEE 445, Air Quality Modeling

CEE 443, Environmental Engineering Principles, Chemical

***Mathematics***

CHBE 521, Applied Mathematics in Chemical and Biomolecular Engineering

ME 471 / CSE 451, Finite Element Analysis

MATH 442, Introduction to Partial Differential Equations