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Data Scientist Intern
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Education

University of Illinois at Urbana-Champaign (UIUC), U.S.	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	
University of Illinois at Urbana-Champaign (UIUC), U.S.	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)	
Zhejiang University (ZJU), China	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	
University of Manchester, UK	02/2013
<i>Student in University Language Centre (01/2013-02/2013)</i>	

Employment

Bayer (Crop Science Division)	09/2018 - 12/2018
The Climate Corporation	
Data Scientist Intern	
Project: <i>Machine Learning Approaches to Soil Properties Regression</i>	
Department of Computer Science (CS) at UIUC	08/2018 - 12/2018
Graduate Assistant	
Duties: Clerical Support, Technical/Support Services.	
Oak Ridge National Laboratory	05/2018 - 08/2018
ORISE Ph.D. Intern/Researcher at ORNL	
Affiliation: National Center for Computational Sciences - Advanced Data and Workflow Group	
Themes: Deep Learning, Computational Science and Engineering, Big Data	
Monsanto Company	01/2018 - 05/2018
The Climate Corporation (Project Sponsor)	
Data Scientist-UIUC Innovation Center	
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

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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- ✓ [Frist Place, Student Paper Award](#), Association of Overseas Chinese Agricultural, Biological, and Food Engineers (AOCABFE) 07/2016
 - ✓ Finalist, [SMOKY MOUNTAIN Computational Sciences and Engineering Conference \(SMC\) Data Challenge](#) 08/2018
 - ✓ Racheff Graduate Student Travel Award, Department of CEE, UIUC 10/2018
 - ✓ 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

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 & 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 & 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 & 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

-
- 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 (\$3,000).
 - 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

(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

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

- [4] **Zheng, Z.**, Anantharaj, V. G., Gasparik, J., Curtis, J. H., Yao, Y., Hughes, M. P., Schmidt, D., West, M., & Riemer, N. (2019). **Machine Learning to Predict Multi-Aerosol Mixing State Metrics**. Poster Presentation in *AMS 99th Annual Meeting*, American Meteorological Society, Phoenix, AZ., January 7.
- [3] **Zheng, Z.**, Dash, S., Schmidt, D., Yin, Y., Riemer, N., West, M., & **Anantharaj, V. G.** (2018). **A Machine Learning Approach to Estimate Multi-Aerosol Mixing State Metrics at a Global Scale in Earth System Models**. Poster Presentation in *2018 AGU Fall Meeting*, American Geophysical Union, Washington, D.C., December 10.
- [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

2015 - 2016

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

Professional Activities

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

2018 -

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

Skills

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

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) A

ABE 425, Engineering Measurement Systems A

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 A

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

CEE 442, Environmental Engineering Principles, Physical A

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 A

ME 471 / CSE 451, Finite Element Analysis A

MATH 442, Introduction to Partial Differential Equations