# XIANG LIU

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## EDUCATION

**Nanjing University (NJU)** **Nanjing, Jiangsu**

*Master of Science in Atmospheric Science* *2021.09 - 2024.06 (Expected)*

**University of Wisconsin-Madison (UW-Madison)** **Madison, Wisconsin**

*Visiting Student in Atmospheric Science* *2020.01 - 2020.08*

**China University of Mining and Technology (CUMT)** **Xuzhou, Jiangsu**

*Bachelor of Engineering in Environmental Engineering* *2017.09 - 2021.06*

**Related Courses:** Bioclimatology, Weather and Climate, Big Data Analysis in Meteorology, Atmospheric Environment Theory and Model, Climate Change Impacts and Adaptations, Atmospheric Aerosols

## RESEARCH INTERESTS

- Machine learning applications in atmospheric environment
- Impacts and adaptations of human system to climate change
- Processes and interactions between air pollution and biosphere

## RESEARCH EXPERIENCE

**NJU, Nanjing, China** 2021.09 - present

*Master's Thesis: The Impacts of Air Pollution on Food Security Based on Statistical Inference*

*Mentor: Professor Haikun Wang, School of Atmospheric Sciences*

***Independent Research: Global Ozone Mapping***

- Harmonized surface ozone measurements and multi-source data (e.g., satellite and reanalysis) to a modeling dataset
- Developed and validated the cluster-enhanced ensemble learning algorithm for ozone predictions
- Make the comparisons between our data with others, which shows our data have the highest accuracy

***Independent Research: China's Air Pollution & Crop Growth***

- Tidied the monthly SIF data to annual crop productivity data by considering crop-specific growth seasons
- Established a most comprehensive statistical crop model to analyze the relationships between crop growth and air pollution levels
- Evaluated the air quality-driven changes in crop yield and air pollution-attributed impacts on food security in China
- Found the pathway to abate ozone and aerosol pollution, showing reducing ozone pollution benefits more than aerosols

**UW-Madison, Madison, U.S.** 2020.01 - 2020.08

*Research Assistant*

*Mentor: Professor Ankur R. Desai, Department of Atmospheric and Oceanic Sciences*

***Independent Research: U.S.'s Air Pollution, Heat Stress & Crop Yields***

- Performed and processed extensive data collection including USDA NASS agricultural statistics, GHCN weather, MERRA-2 reanalysis, EPA air quality, and NARCCAP projected climate data
- Conducted further analysis through an empirical model in R to analyze the damage of historical crop yield
- Concluded that maize and soybean behave differently in response to air pollutants and heat stress
- Researched air pollution and its interactions with climate on accessing yield change

***Course-based Research***

- Analyzed site-based carbon fluxes combined MERRA-2 AOD and BESS MODIS radiation datasets through regression and path analysis to determine aerosol fertilization effects on gross primary productivity
- Employed a large ensemble of model outputs including CMIP6, TRENDY and other satellite-based data to analyze gross primary production by combining solar radiation and atmospheric aerosols trends
- Utilized both site-based and remote-sensed data from FLUXNET and MODIS LAI to find the relationship between leaf area and light-use efficiency in response to redistribution of solar radiation

**NJU, Nanjing, China** 2019.08 - 2020.01

*Research Assistant (Summer Intern)*

*Mentor: Professor Yanxu Zhang, School of Atmospheric Sciences*

- Modified and revised the MOZART boundary to initiate the model simulation
- Used WRF-GC, a new online atmospheric chemical transport model to forecast air quality in China on a Linux system
- Generated results on WRF-GC model through Python and NCL scripts
- Maintained a website that provides a daily prediction of air quality in China

**CUMT, Xuzhou, China** 2019.05 - 2019.07

*Research Assistant*

*Mentor: Associate Professor Ping Lou, School of Environment and Spatial informatics*

- Prepared planktonic crustacean *daphnia magna* for experiment operation
- Designed and conducted experiments to explore the relationship between *daphnia magna* mortality and nano-silver concentration in water

## PUBLICATIONS

1. **Liu, X.**, & Desai, A. R. (2021). Significant reductions in crop yields from air pollution and heat stress in the United States. *Earth's Future*, 9(8), e2021EF002000.
2. **Liu, X**., Zhu, Y., Xue, L., Desai, A. R., & Wang, H. (2022). Cluster-enhanced ensemble learning for mapping global monthly surface ozone from 2003 to 2019. *Geophysical Research Letters*, 49(11), e2022GL097947.

## HONORS & AWARDS

- Guorui Scholarship of the School of Atmospheric Sciences, 2022.10
- Undergraduate Study Abroad Scholarship of CUMT, 2019.11
- National Encouragement Undergraduate Scholarship, 2019.09
- The Third Prize Scholarship of CUMT, 2018.09

- The First Prize of New Year Mathematical Modeling Competition in CUMT, 2018.08
- The Third Prize of Regular Mathematical Modeling Competition in CUMT, 2018.07
- The Third Prize of BoXue Mathematical Modeling Competition in CUMT, 2018.06

## EXTRACURRICULAR ACTIVITIES

- Volunteered for the 110th anniversary of China University of Mining and Technology
- Member of the Youth Inspirational Team of China University of Mining and Technology

## TECHNICAL SKILLS

- **Coding languages:** R, Latex, NCL, Python
- **Software and packages:** MS Office Suite, tidyverse, terra, raster
- **Platforms:** Linux, MacOS, Windows

*Latest update: Jan 28, 2023*