

**Jialei Shen, PhD**  
Assistant Professor  
University of Alabama at Birmingham  
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EDUCATION

2018 - 2023	Syracuse University	PhD	Mechanical and Aerospace Engineering
2015 - 2018	Nanjing University	ME	Architectural Engineering
2011 - 2015	Xi'an Jiaotong University	BE	Mechanical Engineering

PROFESSIONAL EXPERIENCE

2024 - Present	<b>Assistant Professor</b> University of Alabama at Birmingham (UAB) <ul style="list-style-type: none"><li>Civil, Construction, and Environmental Engineering   School of Engineering</li><li>Environmental Health Sciences   School of Public Health</li></ul>
2022 - 2024	<b>Postdoctoral Research Associate</b> National Institute of Standards and Technology (NIST) <ul style="list-style-type: none"><li>Building Energy and Environment Division   Engineering Laboratory</li></ul> University of Maryland, College Park ( <i>PREP program with NIST</i> ) <ul style="list-style-type: none"><li>Chemistry and Biochemistry   College of Computer, Mathematical, and Natural Sciences</li></ul>
2018 - 2022	<b>Research Assistant</b> Syracuse University <ul style="list-style-type: none"><li>Mechanical and Aerospace Engineering   College of Engineering and Computer Science</li></ul>

TEACHING EXPERIENCE

	<b>Instructor</b> University of Alabama at Birmingham <ul style="list-style-type: none"><li>CESC 614, Smart Cities Technologies</li></ul>
Spring 2025	
	<b>Guest Lecturer</b> University of Maryland, College Park <ul style="list-style-type: none"><li>ENME 422, Indoor Environment and Mechanical Systems</li></ul> Syracuse University <ul style="list-style-type: none"><li>MAE 658, Building Environmental Modeling and Simulations</li></ul>
Fall 2023	
Spring 2022	
	<b>Course Juror</b> Washington State University <ul style="list-style-type: none"><li>ARCH 531, Advanced Tectonics</li></ul>
Spring 2024	
	<b>Teaching Assistant</b> Syracuse University <ul style="list-style-type: none"><li>ECS 104, Engineering Computational Tools</li><li>MEE 416, Mechanical Engineering Laboratory</li></ul>
Spring 2020	
Fall 2021, 2019	

## GRANTS, PROJECTS & FELLOWSHIPS

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### Project Participations *(not as PI/co-PI)*

2024 - 2028	<b>IEA-EBC Annex 92</b> , Smart Materials for Energy-Efficient Heating, Cooling and IAQ Control in Residential Buildings (Role: Participant)
2020 - 2025	<b>IEA-EBC Annex 86</b> , Energy Efficient Indoor Air Quality Management in Residential Buildings (Role: Participant)
2022 - 2024	<b>NIST</b> , Ventilation and Indoor Air Quality in Low-Energy Buildings (Role: Postdoc)
2021 - 2024	<b>Honeywell</b> , Indoor Air Quality Research (Role: PhD student)
2021 - 2024	<b>Carrier</b> , Investigation into Needlepoint Bipolar Ionization (NPBI) Technology for Indoor Air Purification (Role: PhD student)
2022 - 2023	<b>Carrier</b> , IAQ Sensor Testing and Evaluation (Role: PhD student)
2020 - 2023	<b>Carrier</b> , Effectiveness of Building Systems Strategies for Mitigation of Airborne Transmission of SARS-CoV-2 (Role: PhD student)
2020 - 2022	<b>DOE Advanced Building Construction (ABC) Project</b> , Integrated Whole-Building Energy Efficiency Retrofit Solution for Residences in Cold/Very Cold Climates (Role: PhD student)
2018 - 2022	<b>National Concrete Masonry Association (NCMA) Foundation</b> , Making the Case for CMU Residential Design and Construction (Role: PhD student)

### Doctoral Fellowships

2018, 2020	<b>Graduate Fellowship</b> , Syracuse University
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## AWARDS & HONORS

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2024	<b>Postdoc and Early-Career Association of Researchers (PEAR) Technical Accolade Finalist</b> , National Institute of Standards and Technology (NIST)
2024	<b>Distinguished Associate Award</b> , National Institute of Standards and Technology (NIST)
2024	<b>Best Application Paper Award</b> , SimBuild 2024 Conference
2022	<b>Best Paper Award</b> , RoomVent 2022 Conference
2019	<b>Excellent Dissertation Honor</b> , Ministry of Education of Jiangsu Province, China
2018	<b>Graduation with Honor</b> , Nanjing University
2017	<b>National Scholarship</b> , Ministry of Education of China
2017	<b>ISIAQ Student Conference Support Award</b> , International Society of Indoor Air Quality and Climate (ISIAQ)
2017	<b>Excellent Student Honor</b> , Nanjing University
2013	<b>Excellent Student Honor</b> , Xi'an Jiaotong University

## PUBLICATIONS & PRESENTATIONS

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Citations: 789, h-index: 14, i10-index: 15 (Google Scholar, 10/2024)

### Book Chapters

2022	1. Zhang, J., <b>Shen, J.</b> , Gao, Z., 2022. Managing IAQ at Multiple Scales - from Urban to Personal Microenvironments. <i>Handbook of Indoor Air Quality</i> , 1–42.
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### Journal Articles

2023	16. Xu, F., <b>Shen, J.</b> , Gao, Z., 2023. A field measurement study of the effects of outdoor pollutants and room volumes on indoor fine particle and ozone concentrations in residential buildings in Nanjing. <i>Journal of Building Engineering</i> 78, 107615. (co-first author)
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- 2022** 15. Guo, X., Buccolieri, R., Gao, Z., Zhang, M., Lyu, T., Rui, L., **Shen, J.**, 2022. On the effects of urban-like intersections on ventilation and pollutant dispersion. *Building Simulation* 15 (3), 419-433.
- 2021** 14. **Shen, J.**, Kong, M., Dong, B., Birnkrant, M.J., Zhang, J., 2021. Airborne transmission of SARS-CoV-2 in indoor environments: A comprehensive review. *Science and Technology for the Built Environment* 27 (10), 1331-1367.
13. Guo, X., Gao, Z., Buccolieri, R., Zhang, M., **Shen, J.**, 2021. Effect of greening on pollutant dispersion and ventilation at urban street intersections. *Building and Environment* 203, 108075.
12. **Shen, J.**, Kong, M., Dong, B., Birnkrant, M.J., Zhang, J., 2021. A systematic approach to estimating the effectiveness of multi-scale IAQ strategies for reducing the risk of airborne infection of SARS-CoV-2. *Building and Environment* 200, 107926.
11. Peng, Y., Gao, Z., Buccolieri, R., **Shen, J.**, Ding, W., 2021. Urban ventilation of typical residential streets and impact of building form variation. *Sustainable Cities and Society* 67, 102735.
10. Zhang, M., Gao, Z., Guo, X., **Shen, J.**, 2021. Ventilation and pollutant concentration for the pedestrian zone, the near-wall zone, and the canopy layer at urban intersections. *International Journal of Environmental Research and Public Health* 18 (21), 11080.
9. **Shen, J.**, Krietemeyer, B., Bartosh, A., Gao, Z., Zhang, J., 2021. Green Design Studio: A modular-based approach for high-performance building design. *Building Simulation* 14, 241–268.
- 2019** 8. Guo, C., Gao, Z., **Shen, J.**, 2019. Emission Rates of Indoor Ozone Emission Devices: A Literature Review. *Building and Environment* 158, 302–318.
7. **Shen, J.**, Gao, Z., 2019. Commuter Exposure to Particulate Matters in Four Common Transportation Modes in Nanjing. *Building and Environment* 156, 156–170.
6. Huang, Y., Rui, L., Gao, Z., **Shen, J.**, 2019. Research progress on reaction between ozone and human occupants. *Journal of Environment and Health* 36(02), 182–187. (in Chinese language)
- 2018** 5. **Shen, J.**, Gao, Z., 2018. Ozone removal on building material surface: A literature review. *Building and Environment* 134, 205–217.
4. Yang, Z., **Shen, J.**, Gao, Z., 2018. Ventilation and Air Quality in Student Dormitory in China: A Case Study during Summer in Nanjing. *International Journal of Environmental Research and Public Health* 15(7), 1328.
3. Rui, L., Buccolieri, R., Gao, Z., Ding, W., **Shen, J.**, 2018. The Impact of Green Space Layouts on Microclimate and Air Quality in Residential Districts of Nanjing, China. *Forests* 9, 224.
2. You, W., **Shen, J.**, Ding, W., 2018. Improving residential building arrangement design by assessing outdoor ventilation efficiency in different regional spaces. *Architectural Science Review*.
- 2017** 1. **Shen, J.**, Gao, Z., Ding, W., Yu, Y., 2017. An investigation on the effect of street morphology to ambient air quality using six real-world cases. *Atmospheric Environment* 164, 85–101.

### Conference Articles & Presentations

- 2024** 18. Guo, X., Guo B., Liu Z., **Shen, J.**, Love, D., McKinney P.J., Zhang, J., 2024. Method of experimental evaluation of MOx sensors for real-time indoor VOCs monitoring. *IBPC 2024*, Toronto, Canada.
17. **Shen, J.**, Dols, W.S., Polidoro, B.J., 2024. ANT: A Multizone Indoor Air Quality (IAQ) and Ventilation Analysis Plug-in for Algorithm Aided Design. *SimBuild 2024*, Denver, CO. (**Best Application Paper Award**)

- 2023 16. **Shen, J.**, Dols, W.S., Polidoro, B.J., 2024. An approach to develop a community-scale model for building indoor air quality (IAQ) analysis and human exposure assessment. *The 1st International Workshop on Building and Simulation (BAS 2024)*, Syracuse, NY.
- 2022 15. Hu, Y., **Shen, J.**, Zhang, J., Gao, Z., 2023. A CFD approach to reduce the risk of Covid-19 airborne transmission in a typical office. *IAQVEC 2023*, Tokyo, Japan.
14. **Shen, J.**, Nabutola, K., Birnkrant, M.J., McKinney, P.J., Dong, B., Zhang, J., 2022. Estimation of infection risk through airborne transmission in large open spaces with different air distributions. *RoomVent 2022*, Xi'an, China. **(Best Paper Award)**
13. **Shen, J.**, Liu, Z., Guo, B., Love, D., Dekold, M., Birnkrant, M.J., Dong, B., Zhang, J., 2022. Performance of in-duct bipolar ionization devices on pollutant removal and potential byproduct formation in indoor environments. *Indoor Air 2022*, Kuopio, Finland.
12. Liu, Z., **Shen, J.**, Guo, B., Zhang, J., 2022. Modeling Secondary Emissions from Indoor Chemical Reactions Initiated by Ozone and Hydroxyl Radicals. *Indoor Air 2022*, Kuopio, Finland.
11. Liu, Z., Parry-Nweye, E., Dhaouadi, Y., Wang, X., **Shen, J.**, Guo, B., Ramirez, M., Gupta, B., Ren, D., Dong, B., Zhang, J., 2022. A Comprehensive Approach to Testing Air Cleaning Devices Under Realistic Room Conditions. *Indoor Air 2022*, Kuopio, Finland.
- 2021 10. **Shen, J.**, Liu, Z., Hu, Y., Birnkrant, M.J., Gao, Z., Dong, B., Zhang, J., 2021. Effectiveness of combined displacement ventilation and partitions for reducing airborne transmission of respiratory diseases in office settings. *Healthy Buildings 2021 America*, Honolulu, HI.
9. **Shen, J.**, Kong, M., Dong, B., Birnkrant, M.J., Zhang, J., 2021. Effectiveness of IAQ strategies for mitigating the airborne infection risk of SARS-CoV-2. *IBPC 2021*, Copenhagen, Denmark.
- 2019 8. **Shen, J.**, Zhang, J., 2019. An approach to develop a green technology database for residential buildings. *IAQVEC 2019*, Bari, Italy.
7. **Shen, J.**, Gu, R., Bartosh, A., Krietemeyer, E., Zhang, J., 2019. Modular-based Green Design Studio for Sustainable Building. *The 17th New York State Green Building Conference*, Syracuse, NY.
- 2017 6. **Shen, J.**, Chen, J., Zhang, X., Zou, S., Gao, Z., 2017. Outdoor and Indoor Ozone Concentration Estimation Based on Artificial Neural Network and Single Zone Mass Balance Model. *ISHVAC 2017*, Jinan, China.
5. **Shen, J.**, Gao, Z., 2017. Commuter Exposure to Particulate Matter of Different Transportation Modes in Nanjing. *ISHVAC 2017*, Jinan, China.
4. **Shen, J.**, Gao, Z., 2017. Steady State and Dynamic Indoor Ozone Estimation Model with Indoor Ozone Source. *Healthy Buildings 2017 Europe*, Lublin, Poland.
3. **Shen, J.**, Gao, Z., Ding, W., You, W., 2017. Study on Relationship of Residential Building Form Variations to Pollutant Dispersion in Streets. *Healthy Buildings 2017 Europe*, Lublin, Poland.
2. You, W., **Shen, J.**, Ding, W., 2017. Improving Wind Environment of Residential Neighborhoods by Understanding the Relationship between Building Layouts and Ventilation Efficiency. *The 8th International Conference on Applied Energy (ICAE 2016)*, Beijing, China.
1. You, W., **Shen, J.**, Ding, W., 2017. Improving wind environment design based on assessing spatial distribution of ventilation efficiency in regional space. *The 9th International Conference on Applied Energy (ICAE 2017)*, Cardiff, United Kingdom.

### Invited Talks & Seminars

- 2024 6. “New CONTAM: Bridging Indoor Air Quality with Health Assessment, Energy Analysis, Smart Controls, and Urban Environments”, Invited Talk to *The 17th CHAMPS Forum and Workshop*, 2024, Syracuse, NY.

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|      | 5. “Engineering in Healthy and Sustainable Buildings and Communities”, Invited Talk to <i>Washington State University</i> , 2024, Pullman, WA.   |
|      | 4. “Indoor Air Quality and Public Health in Built Environments”, Invited Talk to <i>The University of Alabama at Birmingham</i> , 2024, Birmingham, AL.  |
| 2023 | 3. “Performance and Cost of Airborne Infection Mitigation Strategies”, Seminar 12: Balancing Virus Risk Control and Energy Consumption for Better Building Operation, <i>ASHRAE Annual Conference</i> , 2023, Tampa, FL. |
| 2021 | 2. “Ozone Emission Sources and Surface Removal in Indoor Environments”, Seminar 14: Reducing Ozone: A Critical Factor in Improving IAQ, <i>ASHRAE Annual Conference</i> , 2021, Virtual.                                 |
| 2019 | 1. “Green Design Studio for Healthy and Sustainable Buildings and Communities: Exploration of an Innovative Approach”, <i>The 17th New York State Green Building Conference</i> , 2019, Syracuse, NY.                    |

### Software Development

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| 2023 | 1. ANT: Multizone indoor air quality (IAQ) and ventilation analysis plug-in on Rhino Grasshopper. <i>Food4Rhino</i> ( <a href="https://food4rhino.com/app/ant">food4rhino.com/app/ant</a> ), 2023. (324 downloads to date). |
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## PROFESSIONAL SERVICES

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### Journal Editorial Board

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| 2024 - Present | <b>Building Simulation</b> , Youth Editor |
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### Committee Member

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| 2024 | <b>Research Strategic Planning Committee</b> , UAB School of Engineering |
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### Professional Community Participation

#### American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE)

Member of Technical Committee 4.10 Indoor Environmental Modeling

Member of Technical Committee 4.3 Ventilation Requirements and Infiltration

#### International Building Performance Simulation Association (IBPSA)

Member of Membership and Chapters Committee

#### International Society of Indoor Air Quality and Climate (ISIAQ)

#### Association for Computer Aided Design in Architecture (ACADIA)

### Peer Reviewer

#### Journals

- Building and Environment
- Building Simulation
- Indoor Environments
- Journal of Hazardous Materials
- Sustainable Cities and Society
- Science and Technology for the Built Environment
- Journal of Building Engineering
- International Journal of Ventilation
- Indoor and Built Environment
- Air Quality, Atmosphere & Health

#### Conferences

- ASHRAE conferences (2023, 2024, 2025)
- IBPSA conferences (SimBuild 2024)

**Others**

- NIST Publication System