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**Education**

Degree	Field	Institution	Conferral
Ph.D 3.6/4 Doctor of Philosophy	Mechanical Engineering	Carnegie Mellon University (CMU) Pittsburgh, Pennsylvania, USA	June 2019
M.S. 3.88/4 Master of Science	Environmental Engineering	University of Illinois at Urbana–Champaign (UIUC), Urbana, Illinois, USA	August 2015
B.E. 8.44/10 Bachelor of Engineering	Environmental Engineering	Gujarat Technological University Ahmedabad, Gujarat, India	May 2013

**Research and work experience**

Mar '20 – now	<b>High Meadows Postdoc Fellow, Atmospheric Science</b> <i>Office of Chief Scientist, Environmental Defense Fund</i> Hyperlocal air pollutant mapping and analysis to improve the effectiveness of regulatory efforts to reduce air pollution in urban areas like Cangzhou, China, and London, UK.
Aug '19 – Mar '20	<b>Aerosol Mass Spectrometry Research Scientist</b> <i>Chemical Sciences Division, National Oceanic and Atmospheric Administration</i> Instrument development for external calibration of aerosol mass spectrometry used for quantitative characterization of total carbon and total nitrogen content of particulate matter.
July '19	<b>Postdoctoral Research Associate</b> <i>Mechanical Engineering and Center for Atmospheric Particle Studies, CMU</i> Training new graduate students on the theory, unsupervised operation, calibration, maintenance, and troubleshooting of the aerosol mass spectrometer.
Sep '15 – June '19	<b>Graduate Research Assistant</b> <i>Mechanical Engineering and Center for Atmospheric Particle Studies, CMU</i> <ul style="list-style-type: none"> <li>mobile aerosol mass spectrometry to study the spatial and temporal variability of primary and potential aerosol mass at source-specific locations.</li> <li>design and characterization of an oxidation flow reactor (OFR) to simulate the atmospheric photo-oxidative formation of secondary organic aerosols from anthropogenic primary gaseous emissions.</li> </ul>
Aug '16 – Dec '17	<b>Graduate Teaching Assistant</b> <i>Course: Engineering thermodynamics, Fall 2016 and Fall 2017 semesters, Mechanical Engineering, CMU</i>
May '14 – Aug '15	<b>Graduate Research Assistant</b> <i>Dept. of Civil and Environmental Engineering, UIUC</i> Laboratory experiments to characterize hygroscopic properties of emissions from biomass burning.
Jan – May '14	<b>Graduate Teaching Assistant</b> <i>Course: Environmental social science, Dept. of Natural Resources and Environmental Sciences, UIUC</i>

**Published works (h-index = 5; total citations = 88)**

9. **Shah, RU**; Robinson, ES; Gu, P; Apte, JS; Marshall, JD; Robinson, AL; Presto, AA. Socio-economic disparities in exposure to urban restaurant emissions are larger than for traffic. *Environmental Research Letters*. 2020, 15 (11). DOI: [10.1088/1748-9326/abb92](https://doi.org/10.1088/1748-9326/abb92).
8. **Shah, RU**; Coggon, MM; Gkatzelis, GI; McDonald, BC; Tasoglou, A; Huber, H; Gilman, J; Warneke, C; Robinson, AL; Presto, AA. Urban oxidation flow reactor measurements reveal significant secondary organic aerosol contributions from volatile emissions of emerging importance. *Environmental Science and Technology* 2020, 54 (2), 714–725. DOI: [10.1021/acs.est.9b06531](https://doi.org/10.1021/acs.est.9b06531)

7. Zimmerman, N; Li, HZ; Ellis, E; Hauryliuk, A; Robinson, ES; Gu, P; **Shah, RU**; Ye, Q; Snell, L; Subramanian, R; Robinson, AL; Apte, JS; Presto, AA. Improving Correlations between Land Use and Air Pollutant Concentrations Using Wavelet Analysis: Insights from a Low-cost Sensor Network. *Aerosol and Air Quality Research* 2020, 20, 314–328. DOI: [10.4209/aaqr.2019.03.0124](https://doi.org/10.4209/aaqr.2019.03.0124)
6. Robinson, ES; **Shah, RU**; Messier, K; Gu, P; Li, HZ; Apte, JS; Robinson, AL; Presto, AA. Land-use regression modeling of source-resolved PM<sub>1</sub> sub-components from mobile sampling measurements. *Environmental Science and Technology* 2019, 53 (15), 8925–8937. DOI: [10.1021/acs.est.9b01897](https://doi.org/10.1021/acs.est.9b01897)
5. **Shah, RU**. Pre-existing and potential particulate pollution patterns in populous places: probing pollution parity for the poor and the prosperous. *PhD Thesis*, Carnegie Mellon University, 2019.
4. **Shah, RU**; Robinson, ES; Gu, P; Robinson, AL; Apte, JS; Presto, AA. High-spatial-resolution mapping and source apportionment of aerosol composition in Oakland, California using mobile aerosol mass spectrometry. *Atmospheric Chemistry and Physics* 2018, 18 (22), 16325–16344. DOI: [10.5194/acp-18-16325-2018](https://doi.org/10.5194/acp-18-16325-2018)
3. Robinson, ES; Gu, P; Ye, Q; Li, HZ; **Shah, RU**; Apte, JS; Robinson, AL; Presto, AA. Restaurant Impacts on Outdoor Air Quality: Elevated Organic Aerosol Mass from Restaurant Cooking with Neighborhood-Scale Plume Extents. *Environmental Science and Technology* 2018, 52 (16), 9285–9294. DOI: [10.1021/acs.est.8b02654](https://doi.org/10.1021/acs.est.8b02654)
2. Saha, PK; Robinson, ES; **Shah, RU**; Zimmerman, N; Apte, JS; Robinson, AL; Presto, AA. Reduced Ultrafine Particle Concentration in Urban Air: Changes in Nucleation and Anthropogenic Emissions. *Environmental Science and Technology* 2018, 52 (12), 6798–6806. DOI: [10.1021/acs.est.8b00910](https://doi.org/10.1021/acs.est.8b00910)
1. **Shah, RU**. Hygroscopic growth and cloud condensation nuclei activity of fresh and chemically-aged biomass-pyrolyzed organic aerosol. *Master's Thesis*, University of Illinois at Urbana-Champaign, 2015.

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**Research Presentations** (★ = invited / funded by host)

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12. TALK. Presto, AA; Humes, M; Tanzer-Gruener, R; **Shah, RU**; Robinson, AL; Donahue, NM. Temporal Evolution of Secondary Organic Aerosol Production from Volatile Chemical Products *American Association for Aerosol Research Conference*, Virtual, 6 Oct 2020. Also at: *American Geophysical Union Annual Meeting*, Virtual, 15 Dec 2020.
11. TALK. **Shah, RU**; Coggon, MM; Gkatzelis, GI; McDonald, BC; Tasoglou, A; Huber, H; Gilman, J; Warneke, C; Robinson, AL; Presto, AA. SOA Potential of Urban Volatile Chemical Product (VCP) Emissions Explored Using In-Situ Oxidation Flow Reactor. *American Association for Aerosol Research Conference*, Portland OR, 15 Oct 2019.
10. TALK. **Shah, RU**; Robinson, ES; Gu, P; Robinson, AL; Apte, JS; Presto, AA. Near-source spatial extents and socio-economic disparity in urban air pollution exposure. *American Association for Aerosol Research Conference*, Portland OR, 16 Oct 2019.
9. ★ TALK. **Shah, RU**. Pre-existing and potential particulate pollution patterns in populous places. *Pacific Northwest National Laboratory*, Richland WA, 8 Mar 2019.
8. ★ TALK. **Shah, RU**. Pre-existing and potential particulate pollution patterns in populous places. *National Oceanic and Atmospheric Administration*, Boulder CO, 7 Feb 2019.
7. POSTER. **Shah, RU**; Presto, AA. Potential particulates in populous and pristine places. *Atmospheric Chemical Mechanisms Conference*, Davis CA, 5–8 Dec 2018.
6. TALK. **Shah, RU**; Robinson, ES; Gu, P; Robinson, AL; Apte, JS; Presto, AA. Mapping particulate matter in Oakland, California using mobile aerosol mass spectrometry. *10<sup>th</sup> International Aerosol Conference*, St. Louis MO, 6 Sept 2018.
5. TALK. Presto, AA; Robinson, ES; **Shah, RU**; Gu, P; Li, HZ; Apte, JS; Robinson, AL. Long-term exposure to ambient air pollution and cognitive function in older U.S. adults: The multi-ethnic study of atherosclerosis and air pollution *Joint annual meeting: Int'l Society of Exposure Science, Int'l Society for Environmental Epidemiology*, Ottawa, Canada, 26–30 Aug 2018.
4. TALK. Presto, AA; Li, HZ; Robinson, ES; Gu, P; Saha, PK; **Shah, RU**; Apte, JS; Robinson, AL. Spatial patterns of exposures to nontraditional pollutants: source resolved organic aerosol and ultrafine particles *Joint annual meeting: Int'l Society of Exposure Science, Int'l Society for Environmental Epidemiology*, Ottawa, Canada, 26–30 Aug 2018.
3. ★ POSTER. **Shah, RU**; Robinson, ES; Gu, P; Presto, AA. Gradients in concentration and composition of fine particulates in a coastal city: downtown dominates a large area emission source in Port of Oakland CA. *Health Effects Institute Annual Conference*, Chicago IL, 1 May 2018.

2. POSTER. **Shah, RU**; Florou, K; Presto, AA. Aging atmospheric aerosols on an island in the Mediterranean Sea. *American Association for Aerosol Research conference*, Raleigh NC, 10 Oct 2017.
1. POSTER. **Shah, RU**; Emamipour, H; Brem, BT; Bond, TC; Rood, MJ. Hygroscopicity and CCN activity of biomass-burning aerosol. *US Department of Energy: Atmospheric System Research meeting*, Vienna VA, Mar 2015.

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#### **Leadership and outreach**

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- Oct '19     **Student poster judge**  
*American Association for Aerosol Research Conference*, Portland OR, 14–19 Oct 2019.
- Aug '17     **PhD qualifying examination mentor**  
 – Jan '19   Mechanical Engineering Graduate Student Organization ([MEGSO](#)), *CMU*
- Jun '15     **Graduate student instructor**  
 Girls' Adventures in Mathematics, Engineering and Science ([G.A.M.E.S.](#)) outreach, *UIUC*
- Jun '10 –   **Student volunteer**  
 Jun '12     Poverty alleviation outreach, *Yuva Unstoppable*

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#### **Awards, honors, and certificates**

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- May '18     **Student travel award**  
 Health Effects Institute annual conference, Chicago IL
- Mar '17     **Milton Shaw PhD student travel award**  
 Mechanical Engineering graduate student research symposium, *CMU*
- Mar '15     **Ivan Racheff student travel grant**  
*Civil and Environmental Engineering, UIUC*
- Jan '15     **Certified Associate Developer in LabVIEW software**  
*National Instruments, Inc.*

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#### **Peer-reviewer in scientific journals**

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- [Atmospheric Chemistry and Physics](#)
- [Atmospheric Measurement Techniques](#)
- [Environmental Research Letters](#)
- [Aerosol and Air Quality Research](#)
- [Environmental Pollution](#)

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#### **Software skills**

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[R](#)    [QGIS](#)    [SQL](#)    [Igor Pro](#)    [MATLAB](#)    [L<sup>A</sup>T<sub>E</sub>X](#)    [SOLIDWORKS](#)    [LabVIEW](#)    [MS Office and iWork](#)

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#### **Coursework**

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| <ul style="list-style-type: none"> <li>• Air Quality Engineering</li> <li>• Air Quality Modeling</li> <li>• Air Pollutant Sensor Design</li> <li>• Air Quality Control</li> </ul> | <ul style="list-style-type: none"> <li>• Physical Meteorology of the Atmosphere</li> <li>• Fundamental and Advanced Statistical Thermodynamics</li> <li>• Advanced Fluid Dynamics</li> </ul> | <ul style="list-style-type: none"> <li>• Numerical Methods in Engineering</li> <li>• Physical and Chemical Principles of Environmental Engineering</li> </ul> |
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#### **Languages**

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English (proficient)	German (elementary level)	Hindi (proficient)	Gujarati (native)
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