

P. S. GANESH SUBRAMANIAN

Department of Civil and Environmental Engineering, University of Illinois Urbana-Champaign

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EDUCATION

Ph.D. in Environmental Engineering and Science (EES) University of Illinois at Urbana-Champaign (UIUC)	<i>Aug 2020 –</i> <i>CGPA : 4.0/4.0</i>
M.S. in Earth and Environmental Science Indian Institute of Science (IISc), Bangalore	<i>Jun 2019</i> <i>CGPA : 6.4/8.0; First Class</i>
B.Sc.(Research) in Earth and Environmental Science Indian Institute of Science, Bangalore	<i>Jun 2018</i> <i>CGPA : 6.3/8.0; First Class</i>

RESEARCH INTERESTS

Ambient and Indoor Air Quality, Particulate Matter (PM) Health Effects and Exposure Assessment

EMPLOYMENT HISTORY

<i>Graduate Research Assistant (RA), UIUC</i>	<i>Jan 2022 –</i>
<i>Graduate Teaching Assistant (TA), UIUC</i>	<i>Spring 2022, 25</i>
<i>Project Assistant, IISc</i>	<i>Jun 2019 – Mar 2020</i>

AWARDS & HONORS

Fellowships

- *American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) Graduate Student Grant in-Aid (GIA) Award.* *2025 – 26*
- *Air & Waste Management Association (A&WMA) Scholarship Award.* *2025*
- *Mavis Future Faculty Fellowship (MF3), UIUC.* *2024 – 25*
- *Ravindar K. and Kavita Kinra Fellowship, UIUC.* *2020 – 21*
- *Kishore Vaigyanik Protsahan Yojana (KVPY) Fellowship, to pursue undergraduate and MS degrees in basic sciences for 5 years.* *2014 – 19*

Conference Travel Awards

- *Graduate College Conference Presentation Award.* *2025*
- *AAAR Student Travel Grant to attend the AAAR annual conference.* *2023, 24*
- *Ratcheff Travel Award, UIUC to present at different conferences.* *2021 – 25*

Other Awards

- *Student Poster Competition Award (Top 18 of 1200+ posters) at the joint annual meeting of the ISES-ISEE* *2025*
- *ISES Students & New Researchers Lightning Talk Competition Award.* *2025*
- *Listed in “Instructors ranked as excellent by the students” for TA duties in CEE 449 course, UIUC.* *Spr. 2022, 25*
- *Volunteer for AAAR at UIUC student chapter’s award-winning Engineering Open House (EOH) exhibit* *2023-25*
- *Student Poster Competition Award (Top 10 of 300+ posters) at the AAAR annual conference* *2024*
- *Outstanding Podium-presentation award, (1st Position) EES Symposium, UIUC.* *2023, 24*

PEER-REVIEWED PUBLICATIONS

- [16] Y. Aghaei, M.M. Badami, M. Aldekheel, R. Tohidi, Y. Alramzi, **P.S.G. Subramanian**, ..., & C. Sioutas, [Size-segregated chemical composition and oxidative potential of ambient quasi-ultrafine and accumulation mode particles in Los Angeles](#), *Journal of Aerosol Science*, **2025**, 191, 106696.
- [15] B. H. Isenor, G Varnaite, C-H. Jeong, **P.S.G. Subramanian**, R. Duruisseau-Kuntz, V. Zaher-rddine, ..., & A.W.H. Chan, [Impacts of the 2023 Canadian Wildfires on the Oxidative Potential of Particulate Matter](#), *ACS ES&T Air*, **2025**.
- [14] S. Haratian, P.D.C. Chittoo, **P.S.G. Subramanian**, V. Verma, M. Heidarinejad, B. Stephens, M. Sherman, [An integral approach to quantifying equivalent clean airflow rates of indoor air cleaning devices from pulse injection and decay tests](#), *Building and Environment*, **2025**, 285 (B), 113632.
- [13] **P.S.G. Subramanian**, Z. Dai, S. Haratian, M. Heidarinejad, B. Stephens, V. Verma, [Oxidative Potential from Common Indoor Sources of Particulate Matter](#), *Environmental Science & Technology*, **2025**, 59 (25), 12797-12811.
- [12] A. Oloo, V. Vo, **P.S.G. Subramanian**, V. Verma, B.D. Koester, J.L. Riis, ..., & S.E. Martenies, [The association between indoor air pollution and inflammation in children – A scoping review](#), *Indoor Environments*, **2025**, 2 (3), 100104.
- [11] A. Zhou, **P.S.G. Subramanian**, S. El-Naggar, J.L. Shisler, V. Verma, T.H. Nguyen, [Capsid and genome damage are the leading inactivation mechanisms of aerosolized porcine respiratory coronavirus in various relative humidities](#), *Applied and Environmental Microbiology*, **2025**, 91 (5), e02319-24.
- [10] R. Das, **P.S.G. Subramanian**, N. Koseoglu, S. Connelly, M. Tamburini, R. Helliwell, ..., & L. Rao [Design of Decentralized Water and Wastewater Management and Reuse System for Rural India - Challenges and Opportunities](#), *Sustainable Water Resource Management*, **2025**, 11 (1), 12.
- [9] P.A. Dominutti, J.L Jaffrezo, A. Marsal, T. Mhadhbi, R. Elazzouzi, C. Rak, ..., **P.S.G. Subramanian**, ..., & G. Uzu [An interlaboratory comparison to quantify oxidative potential measurement in aerosol particles: challenges and recommendations for harmonisation](#), *Atmospheric Measurement Techniques*, **2025**, 1-32.
- [8] S. Salana, H. Yu, Z. Dai, **P.S.G. Subramanian**, J.V. Puthussery, Y. Wang, ..., & V. Verma [Relationship among PM_{2.5} mass, oxidative potential, and cellular toxicity across different continents](#), *Nature Communications*, **2024**, 15 (1), 5263.
- [7] **P.S.G. Subramanian**, J.V. Puthussery, Y. Mao, S. Salana, T.H. Nguyen, T. Newell, V. Verma, [Influence of Human Activities and Occupancy on the Emission of Indoor Particles from Respiratory and Nonrespiratory Sources](#), *ACS ES&T Air*, **2024**, 1 (5), 386-396.
- [6] Y. Aghaei, M.M. Badami, R. Tohidi, **P.S.G. Subramanian**, R. Boffi, A. Borgini, ..., & C.Sioutas [The Impact of Russia-Ukraine geopolitical conflict on the air quality and toxicological properties of ambient PM_{2.5} in Milan, Italy](#), *Scientific Reports*, **2024**, 14 (1), 5996.
- [5] M. Aldekheel, R. Tohidi, A. Al-Hemoud, F. Alkudari, V. Verma, **P.S.G. Subramanian**, C. Sioutas, [Identifying urban emission sources and their contribution to the oxidative potential of fine particulate matter \(PM_{2.5}\) in Kuwait](#), *Environmental Pollution*, **2024**, 343, 123165.
- [4] **P.S.G. Subramanian**, J. Ananthanarasimhan, P. Leelesh, H. Rao, A.M. Shivapuji, P.L. Girard-Lauriault, L. Rao, [Plasma-activated water from DBD as a source of nitrogen for agriculture: Specific energy and stability studies](#), *Journal of Applied Physics*, **2021**, 129 (9), 093303. *
- [3] **P.S.G. Subramanian**, A.V. Raj, P. Jamwal, S. Connelly, J. Yeluripati, S. Richards, ..., & L. Rao, [Decentralized treatment and recycling of greywater from a school in rural India](#), *Journal of Water Process Engineering*, **2020**, 38, 101695.

[2] **P.S.G. Subramanian**, A. Jain, A.M. Shivapuji, N.R. Sundaresan, S. Dasappa, L. Rao, [Plasma activated water from a dielectric barrier discharge plasma for selective treatment of cancer cells](#), *Plasma Processes and Polymers*, **2020**, 17 (8), 1900260. **

[1] **P.S.G. Subramanian**, R. Harsha, D.K. Manju, M. Hemanth, L. Rao, M.S. Anand, S. Dasappa, [Characterization of plasma activated water for medical Applications](#), *Advanced Materials Letters*, **2019**, 10 (12), 919-923.

* *Selected as a featured article and accompanied by a [nontechnical companion article](#).*

** *Recognized as a top cited article of 2020 - 21 in [Plasma Processes and Polymers Journal](#) and featured in the [front cover](#) of the Journal.*

Manuscripts under review, preprints, or preparation

[9] **P.S.G. Subramanian**, A. Oloo, V. Vo, B. Koester, V. Verma, S.E. Martenies, “Chemical and Oxidative Properties of Indoor PM: Discerning the Influence of Typical Building and Source Characteristics”, *ACS ES&T Air*, **Under Revision, 2025**.

[8] Y. Aghaei, M.M. Badami, **P.S.G. Subramanian**, V. Verma, T. Chatila, C. Sioutas, “Chemical and Toxicological Impacts of the 2025 Southern California Wildfires on Urban Air Quality in Los Angeles”, *ACS ES&T Air*, **Under Revision, 2025**.

[7] A.K. Thakur, **P.S.G. Subramanian**, V. Verma, S. Patel, “The lure of ‘Healthier Smoke’: Comparative Physical, Chemical, and Oxidative Potential Characterization of Emissions from Herbal and Tobacco Cigarettes”, *Environmental Science & Technology*, **Under Review, 2025**.

[6] S. Fazalvalipour, Y. Aghaei, M.M. Badami, M. Aldekheel, R. Tohidi, **P.S.G. Subramanian**, ..., & C. Sioutas, “Contributions of Tailpipe and Non-Tailpipe Emissions to the Oxidative Potential of Source-Resolved PM10 from Major LDV- and HDV-Dominated Freeways in Los Angeles”, *Atmospheric Environment*, **Under Review, 2025**.

[5] S.H. Jathar, A. Maben, J. Tryner, T. Reiley, **P.S.G. Subramanian**, V. Verma, C. L’Orange, “Multi-City Analysis of the Mass, Composition, and Oxidative Potential of Aerosols Collected Using Low-Cost Samplers in India”, *Environmental Sciences: Atmospheres*, **Under Review, 2025**.

[4] S. Fazalvalipour, Y. Aghaei, M.M. Badami, **P.S.G. Subramanian**, V. Verma, A.A. Ruprecht, C. Sioutas, “Portable Air Purification as a Strategy to Mitigate Indoor Exposure to Biomass-Burning PM2.5 and Toxic Constituents in Northern Italy”, **in prep, 2025**.

[3] A.F. Prada, A. Distler, S. Cheng, J.W. Scott, L.P. Chamorro, **P.S.G. Subramanian**, ..., & A. Turner, [Disposable face masks: a direct source for inhalation of microplastics](#), **Preprint, 2023**.

[2] **P.S.G. Subramanian**, O. Nweke, S. Salana, A. Hewitt, R. Betha, V. Verma, “Chemical, Oxidative, and Toxicological Profiles of Fine Ambient Particulate Matter in Alaska”, **in prep, 2025 - 26**.

[1] **P.S.G. Subramanian**, S. Haratian, M. Heidarinejad, B. Stephens, V. Verma, “Characterization of Sources and Sinks of the Oxidative Potential of Particulate Matter Emitted from Household Sources”, **in prep, 2025 - 26**.

CONFERENCE PRESENTATIONS & POSTERS

As Presenter

[11] [Chemical and Oxidative Properties of Indoor PM: Discerning the Influence of Residential Characteristics](#), **Podium Presentation**, *American Association for Aerosol Research (AAAR) Annual Conference*, Buffalo, NY, USA, **2025**.

[10] [Oxidative Potential and Lung-Deposition of Size-Resolved Aerosols Emitted from Common Indoor Sources](#), **Poster Presentation**, *AAAR Annual Conference*, Buffalo, NY, USA, **2025**

- [9] Chemical and Oxidative Properties of Indoor PM: Discerning the Influence of Residential Characteristics, **Poster Presentation**, *Joint Meeting of the International Society of Exposure Science (ISES) and the International Society for Environmental Epidemiology (ISEE)*, Atlanta, GA, USA, **2025**.
- [8] Oxidative Potential of Particulate Matter Emitted from Common Indoor Sources, **Poster Presentation**, *Joint Meeting of ISES-ISEE*, Atlanta, GA, USA, **2025**
- [7] Characterization of Sources and Sinks of the Oxidative Potential of Particulate Matter Emitted from Household Sources, **Poster Presentation**, *Joint Meeting of ISES-ISEE*, Atlanta, GA, USA, **2025**
- [6] Influence of Human Activities and Occupancy on the Emission of Indoor Particles from Respiratory and Non-respiratory Sources, **Podium Presentation**, *AAAR Annual Conference*, Albuquerque, NM, USA, **2024**.
- [5] Characterization of Sources and Sinks of the Oxidative Potential of Particulate Matter Emitted from Household Sources, **Poster Presentation**, *AAAR Annual Conference*, Albuquerque, NM, USA, **2024**.
- [4] Oxidative potential of the particulate matter emitted from common household sources, **Podium Presentation**, *Indoor Air Conference*, Honolulu, HI, USA, **2024**.
- [3] Influence of Human Activities and Occupancy on the Emission of Indoor Particles from Respiratory and Non-respiratory Sources, **Podium Presentation** *Indoor Air Conference*, Honolulu, HI, USA, **2024**.
- [2] Oxidative Potential of the Particulate Matter Emitted from Common Household Sources, **Podium Presentation**, *AAAR Annual Conference*, Portland, OR, USA, **2023**.
- [1] Influence of Human Activities and Occupancy on Emissions of Indoor Particles and Their Potential Contribution to Fomites, **Poster Presentation**, *AAAR Annual Conference*, Raleigh, NC, USA, **2022**.

Invited Presentation

- [1] Discerning the Spatial Trends of PM Oxidative Potential across the Global Scale, *Advancing Globally-Distributed Air Quality Monitoring Meeting*, Washington University at St. Louis, St. Louis, MO, USA, **2025**

RESEARCH EXPERIENCE

Ph.D. Dissertation Title: Evaluating the emission rates, oxidative potential, and chemical composition of PM emitted by indoor sources. (***Ph.D. Advisor:*** Prof. Vishal Verma)

Ph.D. Dissertation Research

- Evaluated the lung-deposited oxidative potential (OP) exposure from indoor PM emissions.
- Characterized the sources and sinks of the OP of PM emitted from residential sources.
- Discerned the influence of residential characteristics on the chemical and oxidative properties PM.
- Characterized of the chemical composition and OP of PM emitted from common indoor sources.
- Evaluated the influence of human activities and occupancy on the emission of indoor particles from respiratory and non-respiratory sources.

Collaborative Research during Ph.D.

- Quantified the chemical composition, emission rates, and OP of PM emitted from tobacco and non-tobacco based Indian cigarettes.
- Quantified the chemical composition and OP of residential PM, to discern the relationship between PM–OP and inflammation in children.
- Designed the aerosol experimental workflow, and quantified the particle deposition rates in a project to elucidate the inactivation mechanisms of respiratory coronavirus.
- Built a semi-automated instrument and measured the OP (using the instrument) of PM collected from different regions globally across multiple projects.
- Development of a semi-automated instrument for multi-sample bioaerosol collection.
- Performed experiments to demonstrate the emissions of mask-fiber aerosols from surgical masks.

Research Experience during M.S.

- Evaluated the feasibility of using plasma-activated water (PAW) as an alternative nitrogen supplement for agricultural applications.
- Evaluated the performance of a decentralized graywater treatment and recycling plant at a school in rural India.
- Designed a plasma electrode to generate PAW, quantified its chemical composition and demonstrated its applicability in selective treatment of cancer cells and as an anti-microbial agent.

TEACHING & MENTORING EXPERIENCE

Teaching

Teaching Assistant: *Environmental Engineering Laboratory – CEE 449* Spr. 2022, 25

I was involved in designing the laboratory experiments for the air quality component of this undergraduate course (Class Strength 20 - 25). I trained the undergraduates students to use different laboratory equipment and helped them formulate the problem statement and hypothesis for their final course projects.

Invited Guest Lectures

2023 - 25

I prepared lecture materials and presented a total of six guest lectures on *Indoor Air Quality, Bioaerosol sampling and Analysis, Experimental Data Analysis and Visualization*, and Cellular cytotoxicity in three different courses; Environmental Engineering (**CEE 330**), Environmental Engineering Laboratory (**CEE 449**), and Public Health Engineering (**CEE 435**) during my Ph.D.

Mentoring Junior Peers

Zhuying Dai, M.S. Student, University of Illinois, Urbana-Champaign	2022 -23
Tahsina Alam, M.S. Student, University of Illinois, Urbana-Champaign	2022 -24
Oluchi Nweke, M.S. Student, University of Illinois, Urbana-Champaign	2023 -25
Anson Regi, M.S. Student, University of Illinois, Urbana-Champaign	2024 -
Yuhui Zhai, Ph.D. Student, University of Illinois, Urbana-Champaign	2025 -

INSTRUMENTATION & RESEARCH SKILLS

Instrumentation (Operation and Maintenance)

Analytical: Spectrophotometer, Spectrofluorometer, Total Organic Carbon Analyzer (TOC), Inductively-Coupled Plasma Mass-Spectrometer (ICP-MS), Ion-Chromatography (IC), pH, Conductivity, and Ion-Selective Electrode probes (ISE).

Aerosol Instrumentation: Scanning Mobility Particle Sizer (SMPS), Optical Particle Sizer (OPS), Dust Trak, High-Volume PM samplers, Cascade Impactors, Bio-Samplers, Biospot-VIVAS, Microbalance, Aethelometer, and numerous low-cost sensors (LCS) .

Research

Aerosol Sampling and Analysis: Chemical characterization, toxicological assessments using acellular and cellular OP assays, emission experiments in indoor and controlled-chamber environments.

Semi-Automated Instrument Design: Design and development of semi-automated instruments using programmable syringe-pumps and multi-position valves in tandem, for multi-sample aerosol and bioaerosol collection, OP measurements, multi-step reaction processes, and kinetic studies.

Wet Lab: Wet chemistry, introductory Microbiology, bacterial culturing and counting, cytotoxicity assessments, design of experiments.

Computational Skills: Microsoft Office, L^AT_EX, basic proficiency in Python, Julia, R, and MATLAB, and Statistical Analysis of Large-Experimental Datasets.

PROFESSIONAL SERVICE & ACTIVITIES

Reviewing

- **Reviewer** for the journals, *Journal of Exposure Science and Environmental Epidemiology* and *Aerosol Science and Technology*
- Assisted my PI, as a **trainee reviewer** for the journals, *Environment International*, *Environmental Science & Technology*, and *ACS ES&T Air*.
- **Reviewer** of abstracts for the *Joint Annual Meeting of ISES-ISEE 2025*

Membership

- American Association for Aerosol Research (AAAR) 2021 –
- International Society of Indoor Air Quality and Climate (ISIAQ) 2024 –
- Air & Waste Management Association (A&WMA) 2024 –
- Association of Environmental Engineering and Science Professors (AEESP) 2024 –
- American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) 2025 –
- International Society of Exposure Science (ISES) 2025 –

Other Activities

- **Session Chair** of the session, "Beyond the flames: The far-reaching health effects of wildfire smoke exposure" at the *Joint Annual Meeting of ISES-ISEE* 2025
- **Student Judge** for poster presentations at the *Joint Annual Meeting of ISES-ISEE* 2025
- **Student Judge** for podium presentations in the *AAAR annual conference* 2024
- **Judge** for poster presentations in the *EES Symposium* 2024, 25

COMMUNITY OUTREACH & EXTRACURRICULAR ACTIVITIES

University Outreach Activities

- Taught a class on air quality and air pollution as part of the *Worldwide Youth in Science and Engineering (WYSE) Summer Camp*, UIUC to high-school students. 2022 – 25
- Trained high-school students to build low-cost aerosol collection devices, and assisted instructors for lab demos as part of the *WYSE Camp*, UIUC. 2022 – 25
- Moderated a special event at the Environmental Engineering and Science Symposium, "*Keeping Urbana-Champaign Resilient Together: A dialogue between Community leaders, Civil & Environmental Engineers and Scientists*" 2025
- Participated in the *Engineering Open House (EOH)*, UIUC, to engage with the local community and kids on air-pollution related issues. 2022 – 25
- Participated in *Science at the Market* outreach event to engage and inform the local community on atmospheric research done at the university. 2023
- Taught high-school students an introductory module on wastewater treatment as part of the *What it takes (WIT) Camp*, UIUC 2022

Volunteering and Service Activities

- Tutored Math and Science to students at *Centennial High School, Champaign* and *UNI High School, Urbana*, once or twice a week as part of the *STEMbassadors Program*, UIUC. 2023 – 24
- Taught Math and Science to underprivileged public school kids over the weekend as part of the *Notebook Drive Initiative*, IISc. 2016 – 19

- Volunteer for charitable organizations and service activities (blood donations) during spare time on weekends

Positions of Responsibility

- Secretary of the Indian Graduate Students Association, UIUC *2021 – 22*
- Membership Director of AAAR Student Chapter, UIUC *2021 – 22*
- Member of the EES Graduate Student Advisory Committee, CEE, UIUC *2024 –*
- Superuser for maintaining instruments and training students on using: Spectrophotometer, Spectrofluorometer, TOC analyzer, SMPS, OPS, microbalance, ICP-MS, and EC-OC analyzer *2021 –*