**ALQAMAH SAYEED**

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**RESEARCH EXPERIENCE**

Experienced researcher with 8+ years in AI-driven atmospheric sciences, specializing in machine learning (ML) and deep learning (DL) for air quality prediction, satellite data assimilation, and climate modeling. Expertise in deep neural networks (CNNs, RNNs, etc.) for digital twins, emulators and bias correction techniques to enhance performance of numerical models. Published in high-impact journals, led multi-institutional projects, and contributed to global air quality initiatives. Passionate about applying AI for societal impact and advancing scientific research at scale.

**EDUCATION**

**University of Houston Houston, TX**

*Department of Earth and Atmospheric Science*

**Ph.D. in Atmospheric Sciences Jan 2018 – Aug 2021**

**Indian Institute of Technology Delhi, India**

*Centre for Atmospheric Sciences*

**M.Tech in Atmospheric Science and Oceanic Sciences Aug 2012-May 2014**

**Ideal Institute of Technology Ghaziabad, UP, India**

*Department of Mechanical Engineering*

**B.Tech in Mechanical Engineering Aug 2007-June 2011**

**RELEVANT EXPERIENCE**

**University of Alabama in Huntsville (UAH) Huntsville, Alabama**

**Research Scientist , Thematic Lead AQ&H Aug 2024 - Present**

* Lead Air Quality and Health Thematic Area of NASA – SERVIR program.
* Co-develop services with regional hubs in Southeast Asia, Hindukush, and Eastern and Southern Africa.
* Support air quality and health impact studies in regional hubs.
* Supported the development of [SERVIR-SEA AQ-Tracker](https://aq-tracker-servir.adpc.net/) that hosts air quality data for Southeast Asia.
* Developed algorithm to bias-correct and downscale GEOS PM2.5 estimation from native 25km to 5km spatial resolution. Operational through [SERVIR-SEA AQ-Tracker](https://aq-tracker-servir.adpc.net/).
* Manage air-quality related applied science teams (AST) funded through NASA-ROSES.
* Develop service concepts and theory of change.
* Lead team for product and service development.
* Stakeholder engagement and capacity building.
* **Mentored interns and research assistants,** guiding AI model development for air pollution research.
* **Conducted AQ Training in Guatemala** at the request of the Vice Minister for the Ministry of Environment.

**Universities Space Research Association (USRA) Huntsville, Alabama**

**Associate Scientist Nov 2022 – Jul 2024**

* Applied Machine Learning and Deep Learning for estimation of PM2.5 using satellite data (GOES-R, VIIRS, MODIS, etc.) and numerical modeling data (MERRA-2, GEOS, etc.).
* Developed **deep learning frameworks** to integrate satellite remote sensing (GOES-R AOD) with numerical weather models to estimate PM2.5. The product is under deployment testing at US-EPA (AirNow Tech) and NOAA. Published as lead author - <https://doi.org/10.1029/2024EA004012>
* Co-investigator on several funded projects (NASA-ROSES, NASA-Google partnership, SERVIR, etc.).
* Prepare and submit proposals for project funding.
* Mentored interns to achieve project goals.
* USRA spot award for outstanding effort in the development of air quality dataset for Southeast Asia.

**Post-Doctoral Research Scientist Sep 2021 – Nov 2022**

* Work on various projects for the estimation of PM2.5, atmospheric air quality, and weather parameters using Machine Learning and Deep Learning

**University of Houston Houston, Texas**

**Research Assistant, Department of Earth and Atmospheric Science Jan 2018 – July 2021**

* Conducted research in atmospheric chemistry, weather forecasting, and machine learning with a team of graduates and faculty.
* Led a team in developing a 14-day ozone forecasting model for the National Institute of Environmental Research (NIER), South Korea.
* Trained personnel at NIER on the Deep Learning models for air-quality forecasts.

**Noida Institute of Engineering and Technology Greater Noida, UP, India**

**Assistant Professor, Department of Mechanical Engineering July 2014 – Oct 2017**

* Taught several mechanical engineering courses.
* Mentored students for their undergraduate thesis.
* Assisted professors and school administrators with continuous development, review, and planning.

**SKILLS AND LANGUAGES**

Technical

* Python and R -Tensorflow, Keras, Scikit-Learn, Openair
* Machine Learning – DNN, CNN, RNN, GAN, Earth Observation Foundation Model (EOFM)
* Atmospheric Models – WRF, CMAQ, CAM-5.0

Languages

* Fluent in English and Native in Hindi

# **PUBLICATIONS (complete list** [**here**](https://scholar.google.com/citations?user=9RGwHf4AAAAJ&hl=en)**)**

**Sayeed**, **A.,** Gupta, P., Henderson, B., Kondragunta, S., Zhang, H., & Liu, Y. (2025). GOES-R PM2.5 Evaluation and Bias Correction: A Deep Learning Approach. *Earth and Space Science*, *12*(2), e2024EA004012. <https://doi.org/10.1029/2024EA004012>

**Sayeed,** **A.,** et al., 2021. A novel CMAQ-CNN hybrid model to forecast hourly surface-ozone concentrations 14 days in advance. Nature Sci. Rep. 11, 1–8. <https://doi.org/10.1038/s41598-021-90446-6>

**Sayeed,** **A.,** et al., 2020. Using a deep convolutional neural network to predict 2017 ozone concentrations, 24 hours in advance. Neural Networks. <https://doi.org/10.1016/j.neunet.2019.09.033>

**Sayeed,** **A.,** et al., 2022. CNN-based model for the spatial imputation (CMSI version 1.0) of in-situ ozone and PM2. 5 measurements. *Atmospheric Environment*, *289*, 119348.

**Sayeed,** **A.,** et al., 2021. Bias correcting and extending the PM forecast by CMAQ up to 7 days using deep convolutional neural networks. *Atmospheric Environment*, *253*, 118376

Pinakana, S. D., Raysoni, A. U., **Sayeed, A.,** Gonzalez, J. L., Temby, O., Wladyka, D., Sepielak, K., & Gupta, P., 2024. Review of Agricultural Biomass Burning and its Impact on Air Quality in the Continental United States of America. *Environmental Advances*, 100546.

# **PORDUCTS**

* MERRA2\_CNN\_HAQAST bias corrected global hourly surface total PM2.5 mass concentration, V1 (MERRA2\_CNN\_HAQAST\_PM25) – [NASA-GESDISC](https://disc.gsfc.nasa.gov/datasets/MERRA2_CNN_HAQAST_PM25_1/summary)
* GOES-R AOD to PM2.5 – [AirNow Tech](https://www.airnowtech.org/navigator/) (Navigator 🡪 Data Fusion)
* Downscaled 5km spatial resolution 3-day forecast for PM2.5 – [SERVIR AQ-Tracker](https://aq-tracker-servir.adpc.net/)