McDonnell Academy Alumni
Mark S. Wrighton Award 2024 Recipient

Dr. Manoranjan Sahu is a leading expert in aerosol and air quality research in India, making groundbreaking contributions to energy, climate, and environmental fields. His innovative work has developed a comprehensive approach to air quality monitoring and control, utilizing smart technology, low-cost sensor networks, and advanced AI/ML techniques. Dr. Sahu's recent work includes the development of an AI/ML-integrated Internet of Things (AI/ML-IoT) based smart air pollution management system. Unlike traditional methods, his team's machine learning framework rapidly identifies pollution, facilitating quick decision-making. This system allows for real-time assessment of air pollutants and helps identify hotspots and sources of pollution, with the potential to contribute to achieving a greener world.

His team has also created several machine learning and physics-informed algorithms to enhance the accuracy of these affordable smart technologies. These developments represent a paradigm shift in air pollution mitigation strategies, allowing for targeted, city-wide solutions. As a research professor, Dr. Sahu continues to lead the way in advancing air quality research, utilizing cutting-edge technology and collaborative efforts to make a lasting impact on environmental health.

Dr. Sahu also led the establishment of two large-scale outdoor air cleaning systems in Delhi. These innovative systems, involving high-powered fans and advanced filtration, have the potential to revolutionize air pollution control. Furthermore, he develops indoor technologies to disinfect bioaerosols, helping control the transmission of bacteria and viruses in indoor spaces. His research and innovations aim to address environmental challenges and promote sustainable living in urban areas across India. His research and innovations aim to address environmental challenges and promote sustainable living in urban areas across India. Collaborating with multinational agencies, Dr. Sahu introduced a groundbreaking concept called "zonal air cleaning" in India's clean air program. This system effectively removes pollutants from the air, providing valuable insights for similar technologies worldwide.

As a faculty member at IIT Bombay, Dr. Sahu played a pivotal role in the establishment of the Aerosol and Air Quality Research facility through collaboration with Washington University in St. Louis. This partnership attracts experts from various disciplines and talented graduate students. Joint research projects, publications, and the development of a joint master's degree program in Aerosol Science and Technology, demonstrate the success of their collaborative efforts. Dr. Sahu also supports the recruitment of students for opportunities at WashU, enhancing research capabilities and providing students with valuable experiences and career prospects.

Dr. Sahu's pioneering work in aerosol and air quality research, coupled with his innovative use of smart sensor and advanced control technology, and his collaborative efforts with international partners, has resulted in groundbreaking advancements in air quality monitoring and control.

Through his leadership in establishing the shared Aerosol and Air Quality Research facility at IIT Bombay and the collaboration with Washington University in St. Louis, Dr. Sahu has fostered an environment of innovation and interdisciplinary research. His efforts contribute to addressing global environmental challenges, promoting sustainable living, and providing students with invaluable experiences and opportunities.

My training, experience, and education at the McDonnel Academy and WashU prepared me well by providing a global perspective that allowed me to excel and think holistically while solving complex societal problems with purpose and passion backed by hard work.

MANORANJAN SAHU