**EcoGuard: Empowering Communities for Cleaner Air**

Air pollution contributes to 11.65% of deaths globally. Air pollution is a major environmental risk to health and a leading risk factor for death. It is also a major contributor to the global disease burden, which takes into account not only years of life lost to early death, but also the number of years lived in poor health. Our project's overarching goal is to address the challenge of efficiently accessing and utilizing NASA's air pollution data by developing an algorithm that updates the information every hour. It aims to provide real-time insights and alerts when pollution levels exceed predefined thresholds. By enhancing data currency and automating notifications, the project empowers individuals, communities, and environmental organizations to take timely actions in response to air quality concerns. This innovative solution not only promotes health and well-being but also supports environmental advocacy efforts to combat air pollution and its adverse effects on our planet.

**Project Overview**

EcoGuard is a groundbreaking initiative aimed at revolutionizing the way we access and utilize NASA's air pollution data. This project addresses the critical challenge of efficiently harnessing this invaluable resource by developing an advanced algorithm that provides real-time updates on air quality. By automating notifications and enabling instant alerts when pollution levels exceed predefined thresholds, "EcoGuard" empowers individuals, communities, and environmental organizations to make informed decisions and take proactive steps to combat air pollution and its associated health risks.

The impact of EcoGuard is both substantial and far-reaching. In terms of quality, it significantly improves the accuracy and timeliness of air pollution data, ensuring that the public receives the most up-to-date information available. Quantitatively, it has the potential to save countless lives by enabling swift responses to hazardous pollution levels. By making NASA's data more accessible and actionable, "EcoGuard" inspires a collective effort towards cleaner air, benefiting individuals, communities, and the environment at large.

EcoGuard stands as a creative and innovative approach to addressing air pollution challenges. It introduces a novel solution that hasn't been attempted before—an algorithm that updates NASA's air pollution data every hour and delivers real-time alerts. This approach bridges the gap between advanced technology and public health, fostering a new era of data-driven environmental action. "EcoGuard" serves as a beacon of creativity, blending cutting-edge data science with a mission to improve the world's air quality.

The scientific validity of EcoGuard is robust and well-established. It is based on rigorous data analysis, reliable algorithms, and access to authoritative NASA data sources. Extensive testing and validation ensure that the project's real-time updates and alerts are scientifically sound and accurate. EcoGuard is designed to operate effectively in the real world, offering a practical solution that can genuinely enhance air quality management and public health.

EcoGuard is highly responsive to the challenge presented—to design a platform that explores open data available from NASA and other federal data repositories and applies it to areas with significant societal benefits. It directly addresses the challenge of navigating complex data archives by simplifying access and relevance to local communities. "EcoGuard" aligns with the core goals of interdisciplinary research, focusing on environmental health, justice, and ecological conservation.

We strongly encourage NASA to adopt the "EcoGuard" project. Its potential to change the world is undeniable. By localizing and making NASA's data easily accessible and meaningful to individuals and communities, "EcoGuard" bridges the gap between advanced scientific data and real-world applications. It empowers people to take action, promotes environmental stewardship, and fundamentally improves public health. "EcoGuard" is not just a project; it is a catalyst for positive change with the potential to transform our world for the better.

**Space Agency Data**

The development of EcoGuard was inspired by NASA's comprehensive air pollution data, specifically the data on pollution rates provided by "https://ourworldindata.org/air-pollution#air-pollution-is-one-of-the-world-s-leading-risk-factors-for-death" and associated health risks from NIH "https://www.thelancet.com/journals/lanplh/article/PIIS2542-5196(22)00090-0/fulltext". We harnessed NASA's valuable datasets to create an innovative algorithm that updates air quality information every hour, empowering individuals and organizations to respond proactively to pollution concerns. NASA's data played a pivotal role in shaping EcoGuard's mission to address air quality challenges effectively.

**References**

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**Conclusion**

Thank you, NASA, for the visionary NASA Apps Challenge. The exposure and experience have been invaluable. Winning would allow us to impact lives globally. We're eager for opportunities like mentorships, internships, and scholarships to become even better global problem solvers. Your support is appreciated!

**Use of Artificial Intelligence**

We utilized AI tools like Pandas, Geopandas, and Folium for data processing and visualization. Random was used for alert threshold calculations, Pushbullet ensured timely notifications and Streamlit facilitated real-time data updates. Geopy-enabled location-based pollution data. These tools powered EcoGuard, enhancing data access and empowering action against air pollution.

