

LumaVita: Executive Summary

Solution

What:

LumaVita is an ML AI-powered prototype designed to help children and families affected by asthma or respiratory issues by providing timely, localized, and accessible air quality data. By integrating multiple datasets, LumaVita predicts hazardous air quality conditions and alerts users before symptoms can worsen.

How:

LumaVita collects and processes environmental data from trusted global and national sources. It uses OpenAQ's aggregated, publicly available air quality data, gathered from government and research-grade monitors worldwide. Additionally, it incorporates model-generated air quality forecasts from the National Air Quality Forecasting Capability (NAQFC), which includes predictions from three major forecasting systems. This data is then processed using advanced ML models to provide personalized alerts, visual dashboards, and proactive health recommendations for caregivers and patients. The goal for this tool is to be accessible via mobile devices and web applications, making it widely available and user-friendly.

Drawbacks:

- Accuracy is dependent on the quality and resolution of external datasets.
- Predictive capabilities may be limited in areas with sparse monitoring infrastructure.
- Requires continuous updating and validation of models to stay reliable over time.

Benefits:

- Provides real-time and forecasted air quality alerts specific to respiratory risk levels.
- Supports proactive asthma management, reducing emergency visits and long-term health impacts.
- Empowers caregivers with knowledge to make informed decisions about outdoor activities.
- Scalable and adaptable for use in schools, pediatric clinics, and smart home systems.
- Encourages awareness and engagement with environmental health issues.

Conclusion:

LumaVita bridges the gap between environmental data and pediatric health by combining open data sources with predictive AI. With respiratory illnesses among children on the rise due to pollution and climate change, LumaVita offers a timely, innovative, and impactful solution. It not only provides actionable insights but also fosters a preventative approach to asthma care, supporting healthier futures for children around the world.