



# NASA Space Apps Noida 2024

World's Largest Space & Science Hackathon

5-6th October 2024 | 36 Hours Hackathon

Innovation partner **I12S**



## Team Details

- a. **Team name:** Algorithm Avengers
- b. **Team leader name:** Supriya Jaiswal
- c. **Problem Statement:** Community Mapping

## VaranasiHydrotrack: Community Water Quality Mapping:

### Problem Definition:

- Communities lack accessible tools to monitor, visualize, and share water quality data, making it difficult to identify and address water pollution issues effectively.

### Brief about the idea:

#### Solution:

- A comprehensive web-based platform that enables:
- Real-time water quality data collection and visualization.
- Community-driven pollution reporting.
- Interactive mapping of water quality metrics.
- Data-driven insights for environmental decision-making.

#### Impact:

- Empowers citizens to actively participate in water quality monitoring.
- Facilitates data-driven environmental policy decisions.
- Creates a transparent, community-led approach to water management.
- Supports the UN's Sustainable Development Goal 6: Clean Water and Sanitation.

#### Target Users:

- Local community members.
- Environmental scientists and researchers.
- Policy makers and government officials.
- Environmental protection agencies.

## Opportunities:

### A. Differentiation from Existing Solutions

- Real-time, community-driven data collection
- Integration of multiple data types (pH, turbidity, contaminants)
- Open-source approach for maximum accessibility
- Combination of scientific data with citizen science

### B. Problem-Solving Approach





- Democratizes water quality monitoring
- Bridges the gap between communities and environmental agencies
- Creates a historical database for trend analysis
- Enables predictive modeling of water quality issues

### C. Unique Selling Propositions





- **User-Centric Design:** Intuitive interface for all skill levels
- **Data Visualization:** Advanced charting for easy interpretation
- **Geocoding Integration:** Precise location mapping
- **Community Engagement:** Fosters collective environmental responsibility

## Core Features:





### Data Collection & Input:

-  User-friendly water quality data submission form
-  Photo upload capability for visual documentation
-  Precise location tagging using Nominatim API
-  Multiple parameter input (pH, turbidity, contaminants)





### Visualization & Analysis:

-  Interactive OpenStreetMap integration
-  Dynamic charts using Chart.js
-  Data filtering and search capabilities
-  Trend analysis and historical data comparison

### Community Engagement:

-  Pollution incident reporting system
-  Comment and discussion features
-  Data export functionality
-  Mobile-responsive design

### Technical Capabilities:

-  Real-time data updates
-  MongoDB spatial indexing for efficient queries
-  Secure data storage and handling
-  API integration for extended functionality

## Process flow diagram or Use-case diagram:

### Use Case:

- The User submits reports and views environmental data on interactive maps, engaging with geocoded locations and visualizing trends in heatmaps or graphs.
- Authorities monitor the reports and environmental data to respond to issues.
- The System interacts with Third-Party APIs to fetch real-time data, geocode locations, and present data through visual tools like Leaflet.js for maps and Chart.js for graphs.
- Offline support ensures Users can contribute even without an internet connection.



Interactive Map

## Submit Water Quality Data

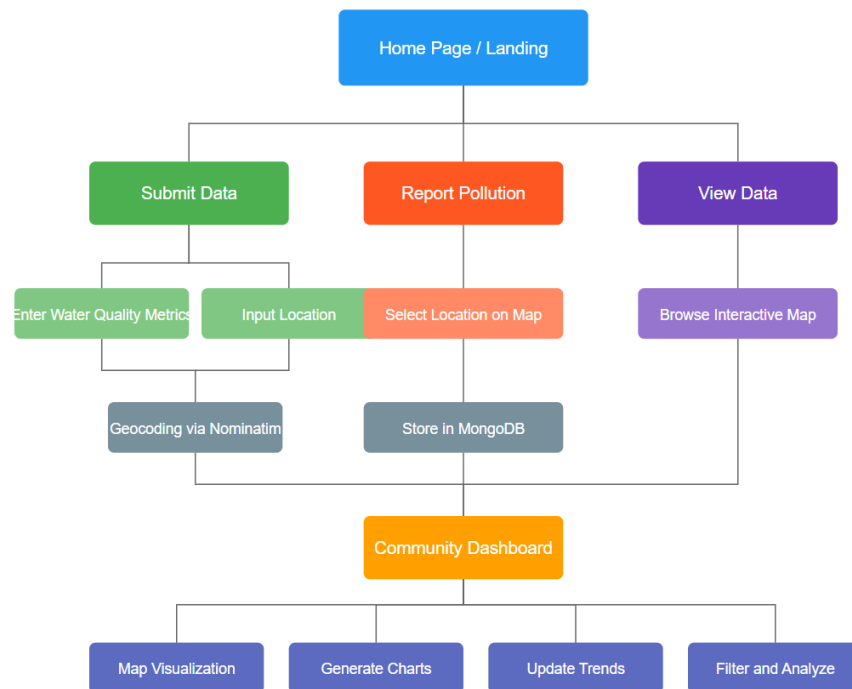
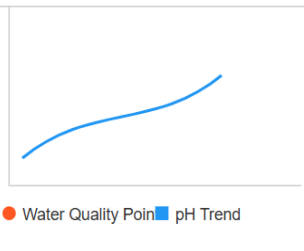
Location

pH Level

Turbidity

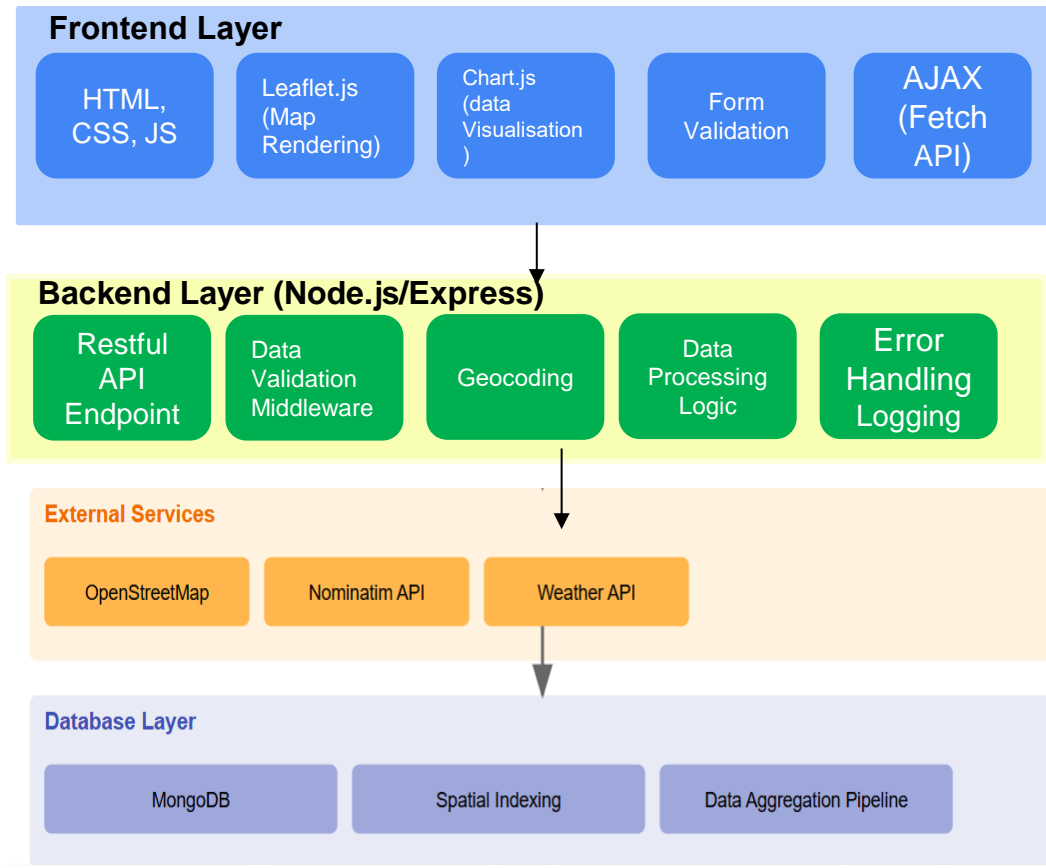
Submit Data

## Water Quality Trends





## Architecture diagram of the proposed solution:

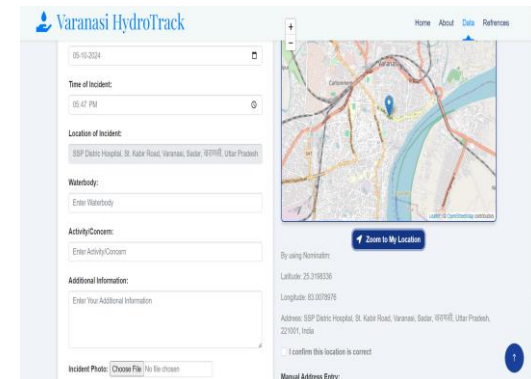
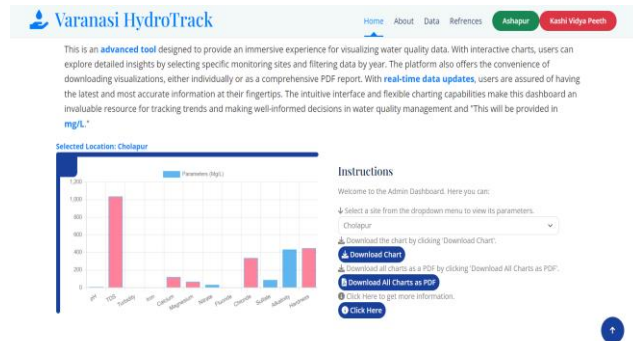
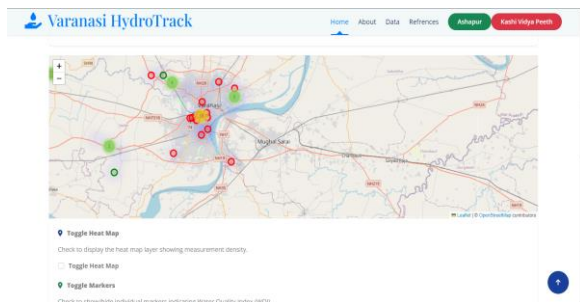
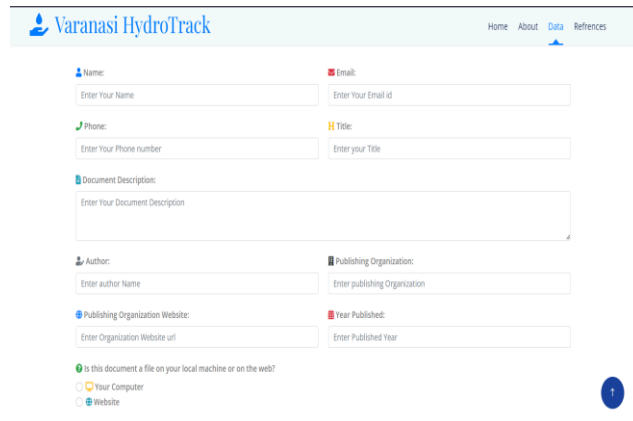


## Technologies to be used in the solution:

- **Frontend:** HTML, CSS, JavaScript
- **Chart.js:** (for Data Visualization)
- **Backend:** Node.js, Express.js
- **Database:** MongoDB (for storing location-based data)
- **APIs:** Nominatim API (for geocoding), OpenStreetMap API (for mapping), and government APIs for real-time data



## Snapshots of the prototype:

**Varanasi HydroTrack**

Home About Data References

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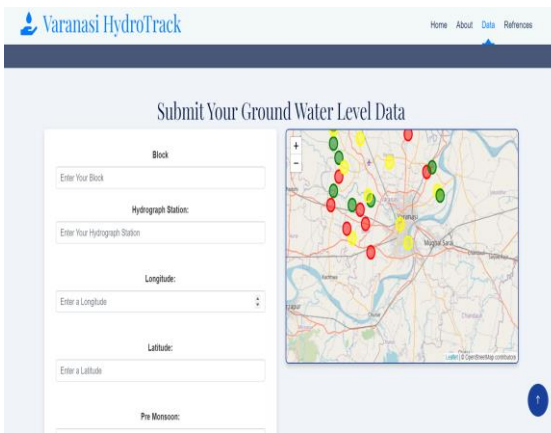
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☐ Website



**Varanasi HydroTrack**

Home About Data References

**Submit Your Ground Water Level Data**

**Block:**  
Enter Your Block

**Hygroph Station:**  
Enter Your Hygroph Station

**Longitude:**  
Enter a Longitude

**Latitude:**  
Enter a Latitude

**Pin Location:**

## Prototype Performance report/Benchmarking:

The performance of the prototype is measured in key areas:

**Loading Time:** Maps and data load in less than 3 seconds for up to 500 data points.

**Real-Time Updates:** Environmental data updates every 10 seconds (like live air/water quality).

**Data Submission:** User-reported issues appear on the map within 5 seconds after submission.

**Mobile Performance:** Works well on both desktop and mobile, with offline access so users can submit data even without internet.

**Backend and Database:** Backend handles 500 requests at a time without slowing down, and database queries (finding nearby pollution spots) take less than 1 second.

Provide links to your:

1. GitHub Public Repository:

<https://github.com/SupriyaJaiswal43/Communitywatermapping>

2. Demo Video Link (3 Minutes):

[https://youtube.com/watch?v=uPHUIZpWQ\\_0&feature=shared](https://youtube.com/watch?v=uPHUIZpWQ_0&feature=shared)

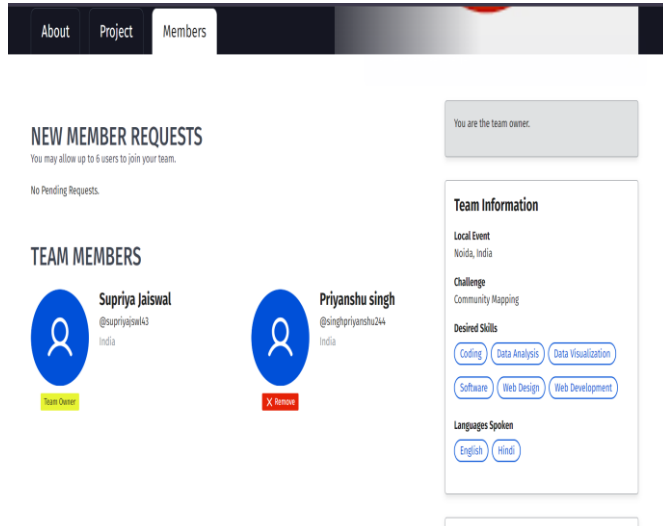
3. Final Product Link:

<https://supriyajaiswal43.github.io/Communitywatermapping/>

I have linked the static version in the final product link. Clicking on this link will display the static version of the project.

Proof of Registration on <https://www.spaceappschallenge.org/nasa-space-apps-2024/2024-local-events/noida>

1. Add screenshots of your registered profile on the above mentioned link.
2. Screenshots to be added for all of the team members.



**About Project Members**

**NEW MEMBER REQUESTS**  
You may allow up to 6 users to join your team.  
No Pending Requests.

**TEAM MEMBERS**

- Supriya Jaiswal**  
@supriyajswl43  
India  
Team Owner
- Priyanshu Singh**  
@singhpriyanshu244  
India  
X Remove

**You are the team owner.**

**Team Information**

**Local Event**  
Noida, India

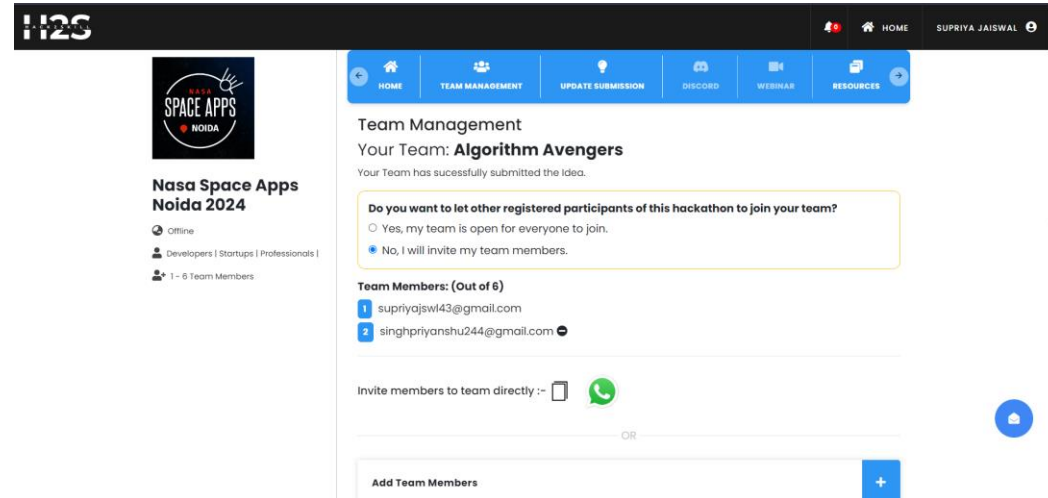
**Challenge**  
Community Mapping

**Desired Skills**

- Coding
- Data Analysis
- Data Visualization
- Software
- Web Design
- Web Development

**Languages Spoken**

- English
- Hindi



**H2S**

**Nasa Space Apps Noida 2024**  
Offline  
Developers | Startups | Professionals |  
1 - 6 Team Members



**Team Management**  
Your Team: **Algorithm Avengers**  
Your Team has successfully submitted the Idea.

**Do you want to let other registered participants of this hackathon to join your team?**


- ☐ Yes, my team is open for everyone to join.
- ☒ No, I will invite my team members.

**Team Members: (Out of 6)**

- 1 supriyajswl43@gmail.com
- 2 singhpriyanshu244@gmail.com

Invite members to team directly :-  

OR

**Add Team Members** 





Innovation partner



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# Thank You

