



Shri Vile Parle Kelavani Mandal's
DWARKADAS J. SANGHVI COLLEGE OF ENGINEERING
(Autonomous College Permanently Affiliated to the University of Mumbai)
NAAC Accredited with "A" Grade (CGPA : 3.18)



DEPARTMENT OF ELECTRONICS & TELECOMMUNICATION ENGINEERING
PRESENTS

UNPLUGGED

2.0

A 24-HOUR HARDWARE HACKATHON

POWERED BY



ROUND 1 Submission

Team Name : Innovation Insurgents

Member Names: Dhruv Warik

Rajas Wagle

Advaiti Dalvi

Sudiksha Shailesh Sawant

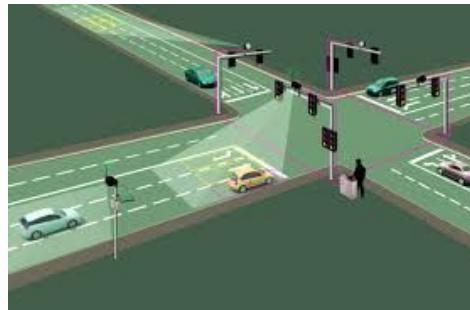
Om Deepak Rane

College Name: Bhartiya Vidya Bhavan's Sardar Patel Institute of Technology

• Problem Statement Overview

Comprehensive Overview of the problem statement :

1. This Smart City Environmental Sentinel must seamlessly integrate sensor interfacing, power management, and real-time data transmission within a scalable and efficient architecture while adhering to strict power and connectivity constraints.
2. The PCB must feature correctly mapped communication protocols for all sensor modules and actuators, along with a robust power management unit that includes battery monitoring, recharging capabilities, and an integrated solar panel interface.
3. The design should ensure scalability and modularity, allowing for future enhancements with minimal redesign, using only standard electronic components readily available in any electronics lab.
4. Additional Points: Participants who incorporate a precision-engineered PCB layout with a 3D CAD model ensuring a perfect structural fit with a predefined solar panel will earn bonus points for their submission



• Components used:

• Microcontroller 1. ESP32-S3 Dev Module

• Sensors: 2. MQ-135 Gas Sensor

- Detects CO₂, NH₃, Benzene, Alcohol, Smoke
- Analog output
- Operating voltage: 5V

3. Sound Sensor Module

- Detects sound intensity
- Analog and digital output
- Operating voltage: 3.3V–5V

4.BME280 Environmental Sensor

- Measures Temperature, Humidity, Pressure
- I2C and SPI interface
- Operating voltage: 3.3V–5V

5. DHT11 Temperature & Humidity Sensor

- Measures temperature (0-50°C) & humidity (20%-90%)
- Digital output
- Operating voltage: 3.3V–5V

6. IR Flame Sensor

- Detects infrared radiation from flames
- Analog and digital output
- Operating voltage: 3.3V–5V

7. Soil Moisture Sensor

- Measures soil water content
- Analog output
- Operating voltage: 3.3V–5V

8. Rain Sensor

- Detects rain intensity
- Analog and digital output
- Operating voltage: 3.3V–5V

9. Dust Sensor

- Measures air quality (PM2.5 particles)
- Analog output
- Operating voltage: 5V

10. Hall Effect Sensor

- Detects magnetic fields
- Digital output
- Operating voltage: 3.3V–5V

11. Water Flow Sensor

- Measures liquid flow rate
- Pulsed digital output

12. OLED Display (128x64)

- 0.96" screen
- I2C interface
- Operating voltage: 3.3V

13.RTC DS3231 Module

- Real-time clock with battery backup
- I2C interface
- Operating voltage: 3.3V

• Impact and Benefits

Social Impact:

Safer Cities: Real-time emergency alerts and faster response times ensure public safety.

Happier Commuters: Stress-free travel with seamless traffic flow and reduced delays.



Economic Benefits:

Cost Efficiency: Slash fuel wastage and operational costs with optimized traffic systems.

Productivity Boost: Streamlined urban mobility fuels economic growth and efficiency.

Environmental Gains:

Cleaner Air: Drastically cut emissions and pollution through smarter traffic and real-time monitoring.

Sustainable Cities: Proactive environmental interventions for healthier urban living.

Technological Advancement:

Smart Innovation: A scalable, cutting-edge model driving the future of smart cities.

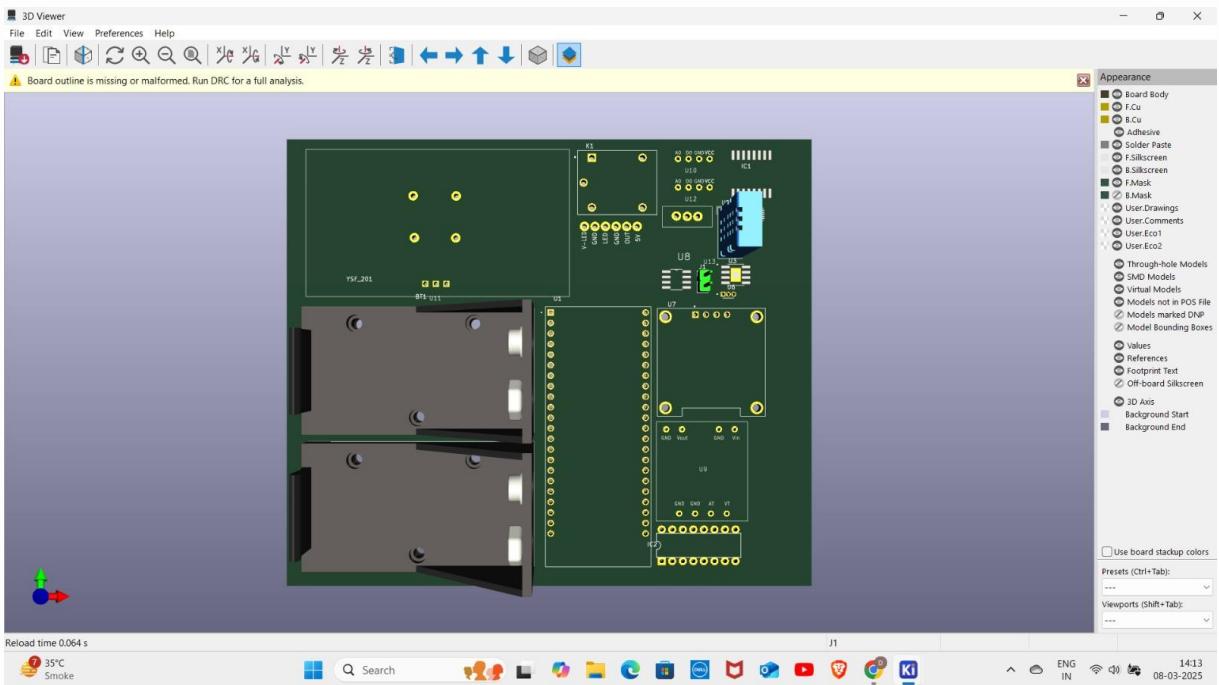
Sustainable Progress: Pioneering urban planning for greener, smarter, and safer communities.

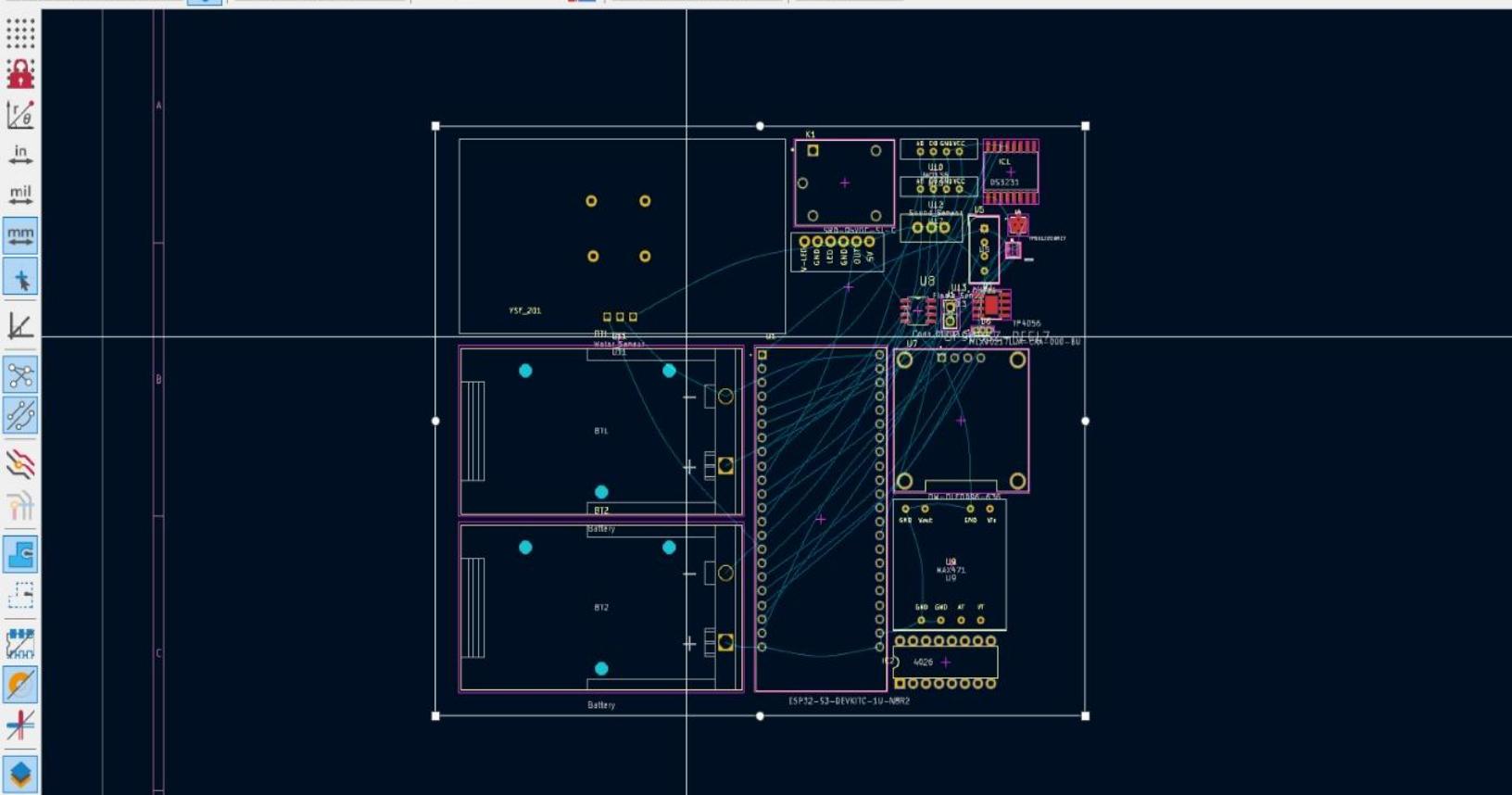
Transforming Cities:

Safer, Greener, Smarter: Revolutionizing urban living for a sustainable tomorrow.

https://github.com/advaitii/SMART_CITY_hackathon_project

- Conclusion (github repository):

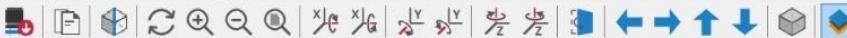




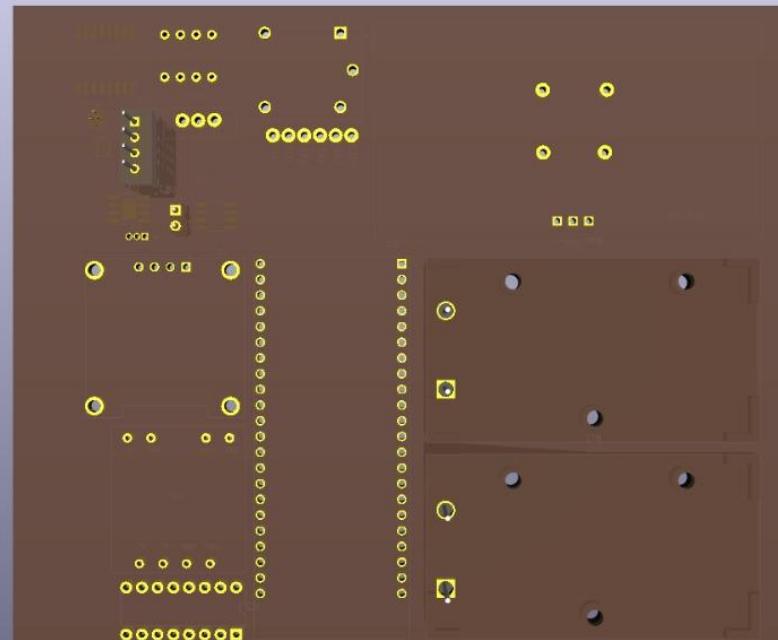
Team Name: Innovation Insurgents

3D Viewer

File Edit View Preferences Help



⚠ Board outline is missing or malformed. Run DRC for a full analysis.



Appearance

- Board Body
- F.Cu
- B.Cu
- Adhesive
- Solder Paste
- F.Silkscreen
- B.Silkscreen
- F.Mask
- B.Mask
- User.Drawings
- User.Comments
- User.Eco1
- User.Eco2
- Through-hole Models
- SMD Models
- Virtual Models
- Models not in POS File
- Models marked DNP
- Model Bounding Boxes
- Values
- References
- Footprint Text
- Off-board Silkscreen
- 3D Axis
- Background Start
- Background End

Use board stackup colors

Presets (Ctrl+Tab):

Viewports (Shift+Tab):

Last render time 2 ms

dx 0.00 dy 0.00 zoom 1.00

35°C
Smoke

Search



ENG

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08-03-2025

