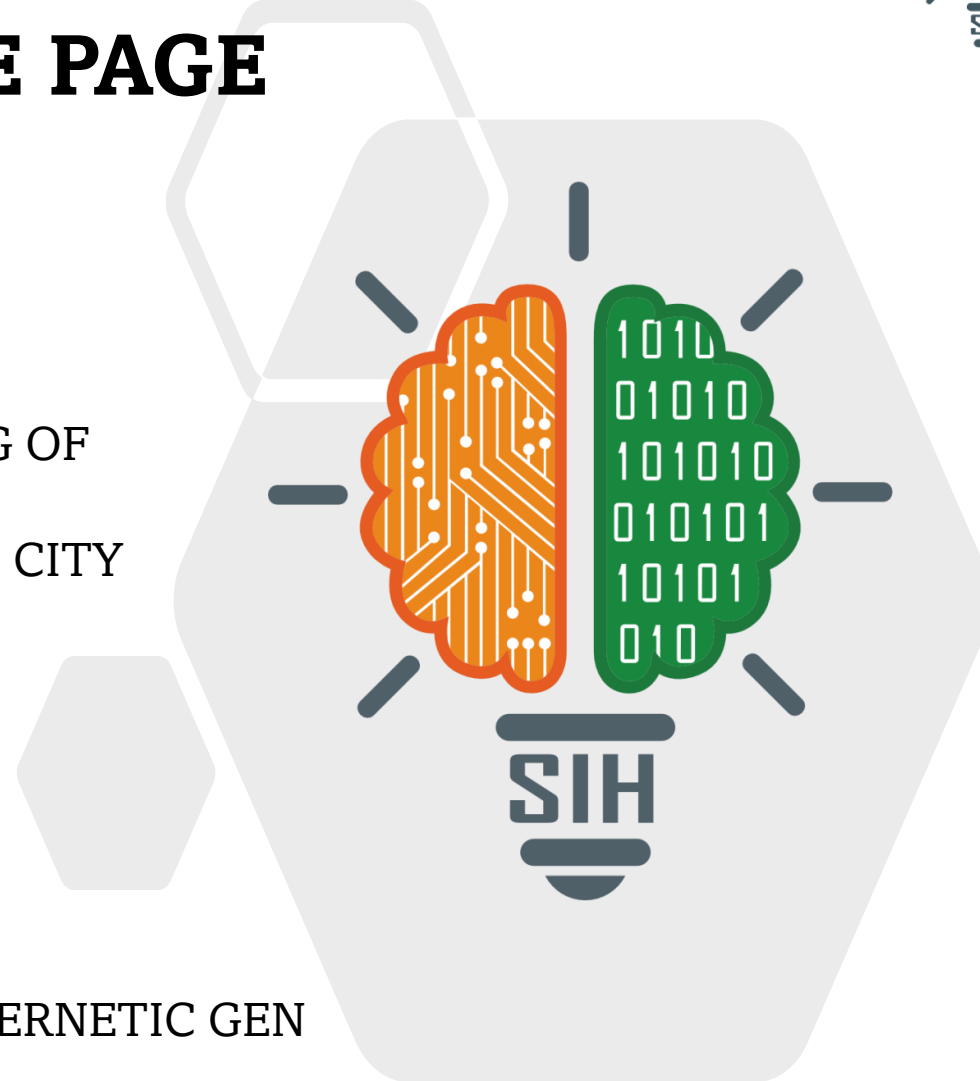




TITLE PAGE

- **Problem Statement ID** – SIH1618
- **Problem Statement Title-** ONLINE MONITORING OF
UNAUTHORIZED CONSTRUCTION ACROSS THE CITY
- **Theme-** ROBOTICS AND DRONE
- **PS Category-** SOFTWARE
- **Team ID-**
- **Team Name (Registered on portal)** – DATA_CYBERNETIC GEN



IDEA TITLE

❖ Idea / Solution:

Implementation of **Real-Time Image Processing & Monitoring using Drone Technology** for online monitoring of unauthorized construction across the city

- **Drone & GIS Surveys:** Use drones with GPS and GIS for real-time monitoring and mapping of unauthorized construction.
- **AI Detection:** AI analyzes images and alerts authorities about illegal structures.
- **Satellite Integration:** Combine satellite and drone data for wider, frequent updates.
- **Real-Time Alerts:** Stream data live and trigger automated alerts for quick action.
- **Cloud & City Integration:** Store data in the cloud and sync with city systems for permit verification.

❖ Problem Resolution:

- Utilize drone-based surveys to monitor construction activities.
- Benefits include real-time detection, cost-effectiveness, and coverage of large areas.

❖ Unique Value Propositions (UVP):

- Real-time drone imagery
- AI-powered object detection
- Integration with existing MCD databases
- Collaboration with DDA
- Web app compatibility
- Accessibility features
- Scalability
- Authenticated Interoperability

1. Algorithm Development:

- Tools: Python, MATLAB
- Libraries: NumPy, SciPy, Scikit-learn
- Frameworks: TensorFlow, PyTorch (for AI models)



2. Web App Development:

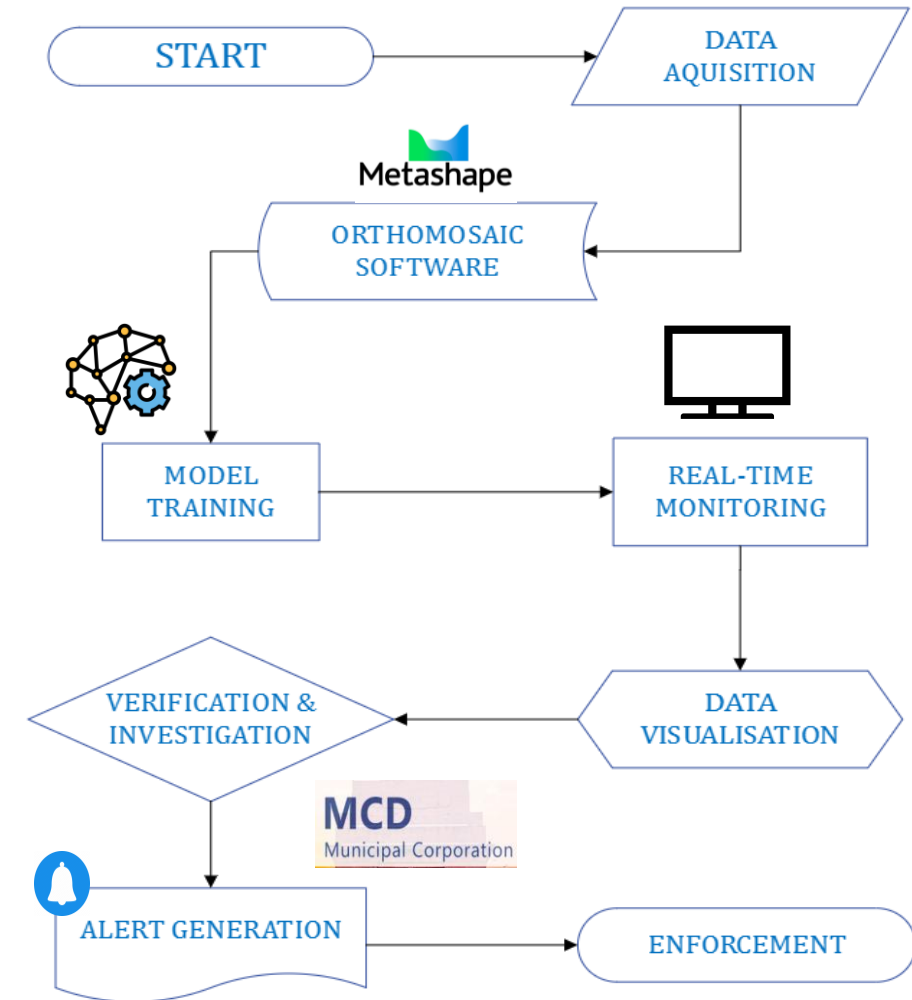
- Frontend: React, Angular, or Vue.js
- Backend: Node.js, Django, or Flask
- Frameworks: Bootstrap or Material-UI for UI components
- Deployment: Docker, Kubernetes for containerization and orchestration

3. AI Model Used:

- Model Type: Convolutional Neural Networks (CNNs) for image analysis
- Libraries/Frameworks: TensorFlow, PyTorch, OpenCV for computer vision tasks
- Pre-trained Models: YOLO (You Only Look Once) or Faster R-CNN for object detection

4. Database Services:

- Relational Databases: PostgreSQL or MySQL
- NoSQL Databases: MongoDB or Firebase for flexible data storage
- Cloud Services: AWS, RDS or Azure SQL Database for managed database services



❖ Feasibility Analysis:

- **Technical:** Drones can provide real-time data, but require high-end cameras and stable systems.
- **Operational:** Quick area coverage is feasible but needs trained operators and clear regulations.
- **Economic:** High initial cost, but long-term savings from reduced inspection costs.
- **Legal:** Compliance with airspace and privacy laws is critical.
- **Social:** The public benefits from reduced illegal construction, but privacy concerns may arise.

❖ Potential Risks for Online Monitoring in Delhi

- **Data Quality and Accuracy:** Cloud cover, image resolution, internet connectivity, and power outages can affect data quality.
- **Social and Political Factors:** Resistance from land grabbers and political interference can hinder implementation.
- **Ethical and Privacy Concerns:** Mass surveillance and data security risks.
- **Resource Constraints:** Budget limitations and human resource shortages.
- **Complex Urban Landscape:** Dense urban fabric and rapid urbanization.

❖ Strategies for Overcoming Challenges:

- **Data Quality:** Use high-resolution cameras and ensure backup power and connectivity.
- **Social & Political:** Engage communities, build support, and work with law enforcement.
- **Ethical & Privacy:** Implement strong data security, anonymize information, and ensure transparency.
- **Resource Constraints:** Seek funding partnerships and invest in staff training.
- **Urban Complexity:** Use advanced mapping and focus on high-activity areas.

IMPACT AND BENEFITS

❖ Potential Benefits of Online Monitoring

- **Improved Urban Planning:** Data-driven decisions and prevention of illegal encroachments.
- **Enhanced Law Enforcement:** Efficient enforcement and reduced corruption.
- **Improved Public Safety:** Identification of unsafe structures and prevention of natural disasters.
- **Environmental Protection:** Prevention of environmental damage and compliance with regulations.
- **Economic Benefits:** Increased property values and reduced litigation.
- **Improved Citizen Engagement:** Public participation and transparency.

❖ Potential Impacts of Online Monitoring using Drone Technology

• Positive Aspects:

- **Improvement:** Real-time data boosts monitoring efficiency.
- **Economical:** Cuts manual inspection costs.
- **New Opportunities:** Opens jobs in drone operation and analysis.
- **Social Benefits:** Prevents illegal construction, enhancing city planning.

• Negative Aspects:

- **Cost:** One-time high initial investment.
- **Technology Adaptation Issues:** Requires training and may face resistance.

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