SMART INDIA HACKATHON 2024

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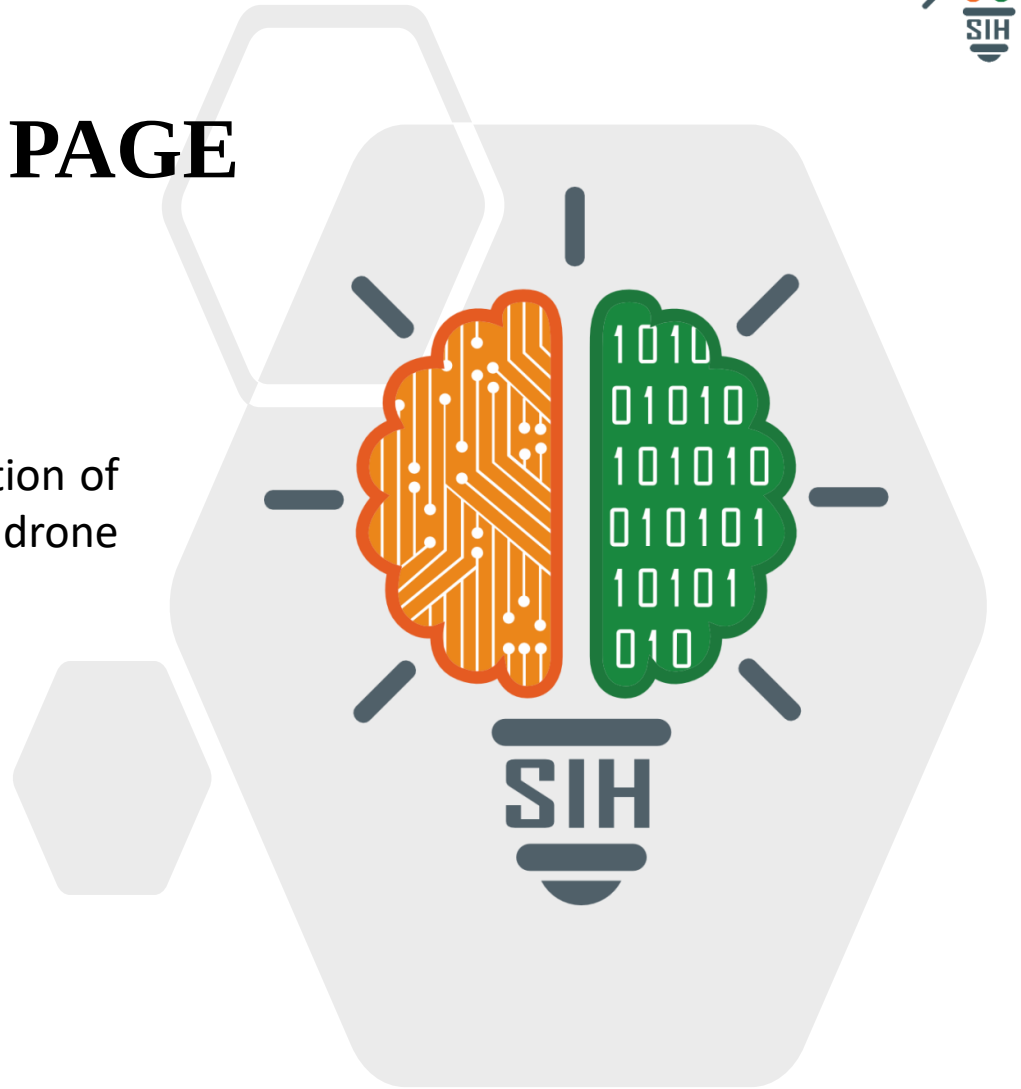
TITLE PAGE



- **Problem Statement ID –**SIH1705
- **Problem Statement –**Development and Optimization of Al model for Feature identification/ Extraction from drone orthophotos.
- **Theme-**Robotics and Drones
- **PS Category-** Software
- **Team ID-**24649
- **Team Name -**InnoHackers

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IDEA TITLE

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❖ Proposed Solution

Dynamic Land Use Prediction: Forecasts future land use, enabling proactive planning and efficient resource allocation.

- Hybrid Imagery Fusion
- Blockchain for Secure Records
- Real-Time Environmental Monitoring
- Augmented Reality Visualization
- Crowdsourced Validation
- Renewable Energy Mapping

❖ How It Addresses the Problem?

Integrated Ecosystem: Combines AI, IoT, and blockchain for real-time monitoring, predictive analysis, and secure record-keeping, enhancing sustainable land management.

Community Engagement: Crowdsourced validation empowers local communities to participate, improving data accuracy and fostering ownership, while promoting sustainable practices.

❖ Innovation and Uniqueness

Predictive Analytics: AI forecasts future land use trends for proactive planning.

Augmented Reality: Visualizes AI data in real-world settings, boosting community engagement.

Renewable Energy Mapping: Identifies optimal sites for solar and wind energy projects.

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TECHNICAL APPROACH

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Technologies to be Used

Artificial Intelligence/ML
- Temporal Convolutional Neural Networks
- Generative Adversarial Networks (GANs)

Data Analytics/Visualization
- Remote sensing
- Data visualization tools, Augmented Reality

IoT/Sensors
- Environmental and Drone-based sensors

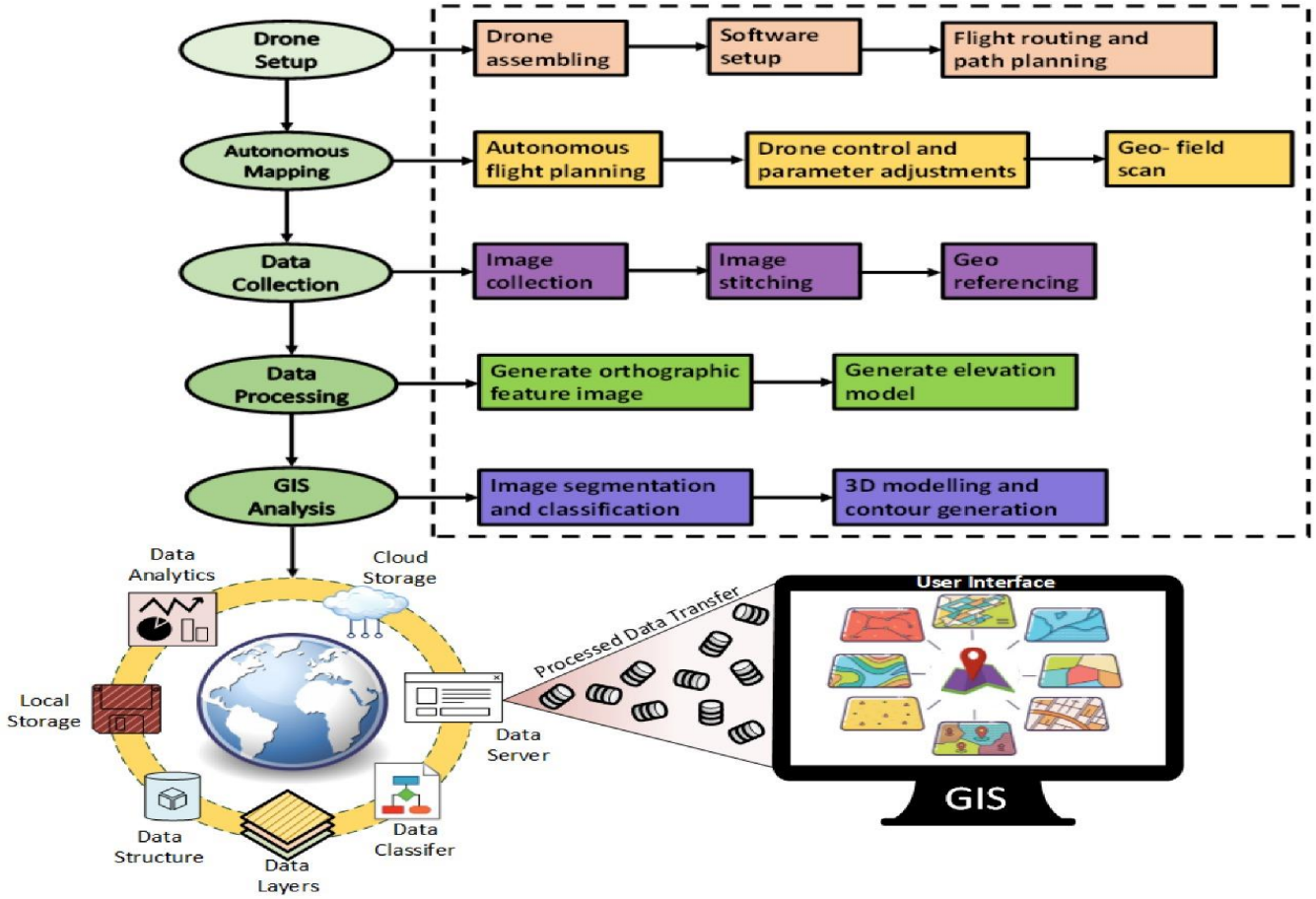
Mobile/Web Development
- Mobile app development or Web app

Cloud Computing/Storage
- Cloud storage and Cloud computing

Software/Tools
- Python, QGIS, TensorFlow,React Native

Hardware
- Drones, High-performance computing infrastructure, Mobile devices,AR/VR headsets

Methodology and Process for Implementation



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FEASIBILITY AND VIABILITY

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- **Analysis of the feasibility of the idea**

Drone orthophotos are increasingly available due to the widespread use of drones in agriculture, urban planning . These high-resolution images can provide rich datasets for AI models.

- **Potential challenges and risks**

Labeling Data: Annotating orthophotos for training can be labor-intensive, requiring human expertise to identify objects, landforms.
Georeferencing Issues: Accurate georeferencing is critical in orthophotos, and slight errors in GPS data may occur.

- **Strategies for overcoming these challenges**

Data Augmentation , Transfer Learning- Start with pre-trained models on large datasets, Regional Specialization: Train multiple models specialized for different environments

Viability

Cost Efficiency: Once developed, AI models can automate tasks that would otherwise require significant human labor. This reduces long-term operational costs.
Custom Solutions: Developing specialized AI models for feature extraction from drone orthophotos can provide a competitive edge
Open-Source Tools: Tools like Google Earth Engine, TensorFlow, PyTorch , and others can provide a low-cost development path, reducing R&D expenses and making custom solutions more competitive.
Collaboration: There is a growing ecosystem for AI in geospatial data, offering opportunities for partnerships with GIS software providers, drone manufacturers, and data analytics companies.

IMPACT AND BENEFITS

Potential Impact

1.Transformed land management practices
2. Improved resource allocation and utilization
3. Enhanced environmental sustainability
4. Increased community involvement and social cohesion
5. Economic growth and development

Benefits

1. Improved transparency, accountability, and trust
2. Increased efficiency, productivity, and cost savings
3. Better community engagement and participation
4. Environmental conservation and reduced pollution
5. Economic development and job creation
6. Improved public health and quality of life
7. Increased sustainability and resilience