Project Proposal

Smart Tourist Safety Monitoring & Incident Response System using AI, Geo-Fencing, and Blockchain-based Digital ID

1. Problem Statement Explained

Context (Why this is needed)

Tourism is a major sector, especially in culturally and geographically rich regions. However, tourists often face safety risks such as:
- Getting lost in unfamiliar areas.
- Entering dangerous or restricted zones (wildlife areas, unsafe terrains, conflict-prone places).
- Theft, fraud, or identity misuse.
- Delayed help during accidents or medical emergencies.
- Lack of quick verification of a tourist's identity in case of incidents.

Traditional safety systems (manual check-posts, paper IDs, police patrolling) are slow, fragmented, and reactive rather than proactive. This can lead to higher risks and poor tourist experience.

Core Problem

How can we build a smart digital system that:
- Continuously monitors tourist safety in real-time.
- Prevents risks (like entering unsafe zones) using geo-fencing.
- Ensures quick response during emergencies.
- Provides secure, verifiable digital identity to tourists without risk of forgery.

2. Role of Technologies in the Solution

AI (Artificial Intelligence)

- Analyze movement patterns of tourists to detect unusual activity (e.g., a tourist not returning from a trail).
- Predict high-risk situations (crowd surges, dangerous weather).
- Automate incident detection (e.g., fall detection via sensors/mobile).

Geo-Fencing

- Virtual boundaries set around safe tourist zones.
- Alerts triggered when a tourist moves into restricted/dangerous areas.
- Helps track missing tourists by their last known location.

Blockchain-based Digital ID

- Tourists get a secure, tamper-proof digital identity stored on blockchain.
- Can be used for check-ins at hotels, tourist spots, and transport without physical documents.
- Ensures privacy (only necessary info shared) and prevents forgery or identity theft.

3. Proposed Solution

We propose a **Smart Tourist Safety Monitoring & Incident Response Platform** that integrates AI, Geo-Fencing, and Blockchain IDs.

Key Features:

- Mobile App for tourists with AI-based safety alerts.
- Geo-fencing to alert when entering unsafe zones.
- Blockchain-based Digital ID for secure check-ins and verification.
- Central dashboard for authorities to monitor real-time tourist safety.
- Automated emergency response (SOS button, location sharing).

4. Required Tech Stack

Frontend:

- React (Web Dashboard)
- Flutter / React Native (Mobile App)

Backend:

- Node.js (Express/NestJS) or FastAPI (Python) for APIs

Database:

- PostgreSQL (Tourist data, geofencing zones)
- MongoDB (incident logs, unstructured data)

AI & Analytics:

- Python libraries (Scikit-learn, TensorFlow, OpenCV)
- ML models for anomaly detection, crowd analysis

Geo-Fencing:

- Google Maps API / Mapbox for location tracking
- Geo-fence service to trigger alerts

Blockchain:

- Ethereum / Hyperledger for digital ID system

Notifications & Alerts:

- Twilio / Firebase Cloud Messaging for alerts

Deployment:

- Docker & Kubernetes on AWS / Azure / GCP