



# ESHAN COLLEGE OF ENGINEERING



WITH SMART NAVIGATION FUNCTIONS  
AND AI FEATURES

# SMART SHOES





## Overview

- According to the Indian missing person report, the number of missing children and elderly individuals is increasing.
- Dementia patients often forget important details, such as their home address.
- To address these issue, we have developed a smart shoe that provides real-time location tracking and navigation features.
- It includes haptic feedback, such as vibration alerts, to assist visually impaired individuals.
- Additionally, the smart shoe offers fitness tracking features, including step count, calorie burn, temperature monitoring, and habit tracking etc.

# Smart Shoes: The Future of Footwear

Understanding the problem statement

1

## Inefficient Walking & Running Posture

Many people unknowingly have poor walking or running posture, leading to fatigue, joint pain, or long-term injuries.

2

## No Early Warning for Foot Injuries or Pain

People often overstress their feet without realizing it, leading to pain, swelling, or even foot disorders.

3

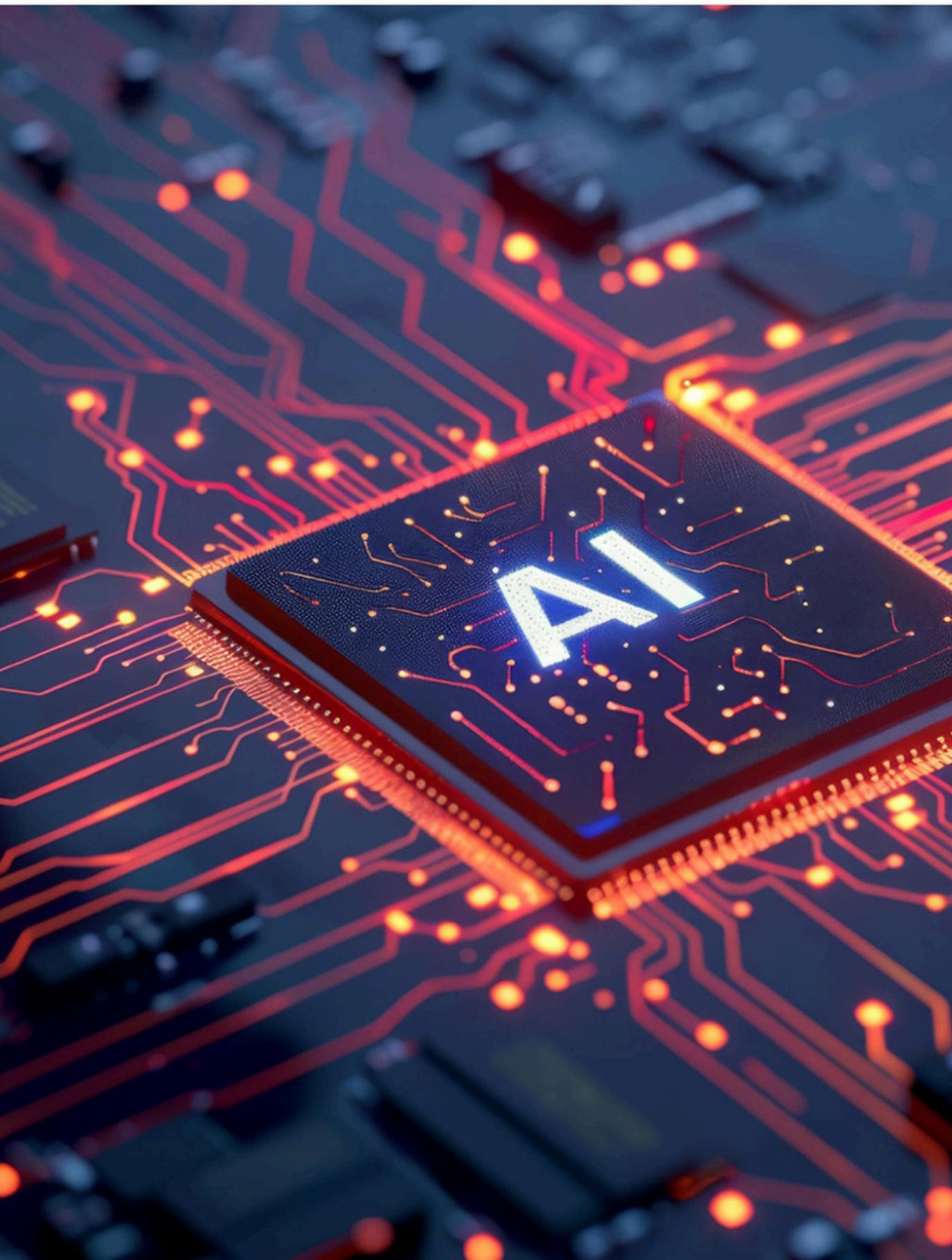
## Lack of Smart Navigation for Visually Impaired Users

Blind people struggle with navigation, especially in unfamiliar areas.

4

## No Fall Detection or Emergency Alerts for Elderly Users

Elderly individuals are prone to falls, which can be life-threatening if help is not available.



# Smart Shoes: The Future of Footwear

Understanding the problem statement

5

## Poor Fit & Comfort Issues in Standard Shoes

Many people suffer from tight or loose shoes that cause blisters, foot pain, or discomfort.

6

## No Real-Time Mental Health & Mood Monitoring

Stress, anxiety, and depression affect millions, but there's no easy way to monitor mental health through walking patterns.



## 1 Real-time Gait Analysis

AI analyzes walking posture, balance, and step consistency.  
Detects fatigue, uneven walking patterns, or potential injuries

## 4 AI-Powered Auto-Adjustable Fit System

Uses pressure sensors + AI to detect foot shape, size, and tightness level.  
Automatically tightens or loosens the shoe based on activity

## 2 AI-Based Fall Detection & Emergency Alerts

AI detects unusual motion patterns that indicate a fall.  
If a fall is detected, the system waits 30 seconds for a response.

## 3 AI-Optimized Battery Management

AI monitors battery usage patterns & sensor activity.  
Optimizes power consumption by deactivating unused sensors.

## 5 AI-Powered Step Energy Harvesting

Converts walking energy into electricity using piezoelectric sensors.  
AI optimizes power usage to extend battery life.

# Our Solution

Leveraging AI Technology for Enhanced Physical Wellbeing



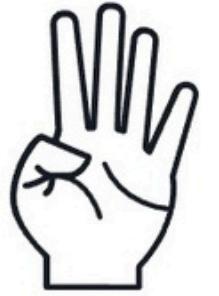
**AI-Driven Personalization & Automation**



**Multi-Functionality: One Shoe, Many Features**



**AI-Powered Health & Wellness Tracking**



**Smart Material Innovation:  
Auto-Adjusting &  
Responsive Soles**



**Sustainable & Energy-Efficient Design**

## **Features & Innovation**

Supporting Elderly Safety and Well-being



# Smart Shoes: Feasibility Analysis

## Technical Feasibility

Uses ESP32, LoRa, AI, and smart sensors for navigation, health tracking, and auto-fit.

✓✓✓



## Operational Feasibility

Requires hardware integration, mobile app development, and AI model training. Complex but achievable.

✓✓



## Economic Feasibility

Initial development costs may be moderate due to AI & smart materials

✓✓



## Market Feasibility

The wearable tech industry is growing, and no major company offers all features together. High market potential.

✓✓✓



## Sustainability Feasibility

Energy harvesting & AI-optimized power management make it eco-friendly.

✓✓✓



## Manufacturing Feasibility

Can be developed using existing manufacturing techniques, but AI-driven components may require R&D for optimization.

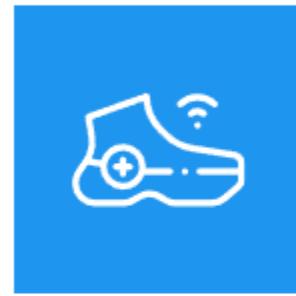
✓✓





# Flow of Events

Summary of features



## Start: User Wears the Smart Shoes

IMU Sensor (MPU6050) →  
Tracks gait, posture, and step count.  
GPS Module (NEO-6M) →  
Determines user location.



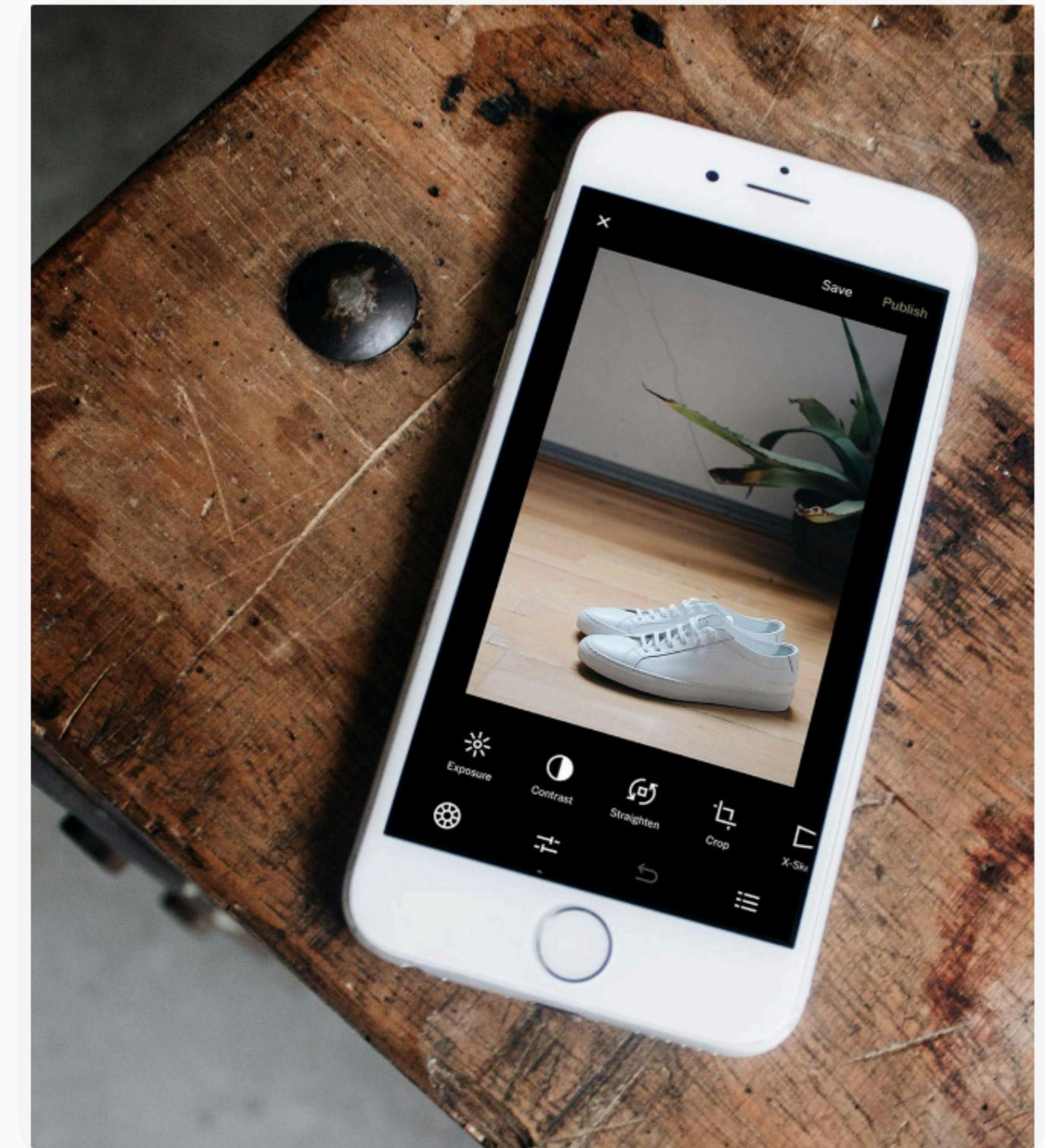
## Sensor Activation & Data Collection

Pressure Sensors →  
Detects weight distribution & foot health.  
Temperature Sensors →  
Monitors environmental & foot temperature.



## AI Processing & Smart Features Activation

If walking posture is incorrect → Sends correction alerts.  
If navigation assistance is needed → Vibrates directionally.  
If foot pressure is uneven → Suggests better positioning.





# Market & Opportunity

1. The smart shoes market is driven by the increasing demand for hand-free navigation solution across various industries
2. The aging population and growing awareness of fitness contribute to a rising demand for assistive and performance enhancing footwear.
3. The ongoing advancements in sensor technology, wireless communication, and haptic feedback creates new opportunities for smart shoe innovation.



## Competitive Landscape

The competitive landscape of smart shoes includes established footwear brands exploring technology integration, tech companies venturing into wearable devices, and startups focused on innovative navigation solutions. Key differentiators include technology performance, comfort, design, and target market.

1. Established Footwear Brands like Nike, Adidas.
2. Tech Companies like Xiaomi, Digitsole.
3. Startups like Baliston.



# LEAN CANVAS

## PROBLEM

- missing children & elderly (dementia patients)
- Lack of hands-free real-time navigation,
- Military personnel need enhanced tracking & terrain navigation

## SOLUTION

- GPS-enabled smart shoes for real-time tracking.
- RFID geofencing alerts for high-risk individuals (kids, elderly, army)

## KEY METRICS

- Number of units sold & market penetration
- Customer retention & satisfaction (feedback, app analytics)
- Safety impact (reduction in missing cases)

## COST STRUCTURE

- Product Development – Sensors, GPS, Haptic Tech
- Manufacturing & Distribution
- Marketing & Branding
- Customer Support & App Maintenance

## UNIQUE VALUE PROPOSITION

- First-of-its-kind hands-free wearable tech.
- Designed for safety, health, and military applications.
- Lightweight, energy-efficient, & comfortable
- fully customized to meet human needs.

## UNFAIR ADVANTAGES

- First-mover advantage in hands-free smart wearable navigation
- High-security tracking & SOS alerts
- Better usability & comfort than existing smartwatches

## CHANNELS

- Online – Amazon, Flipkart, Official Website
- Offline – Retail shoe stores, healthcare centers
- Partnerships – Government initiatives, NGOs, military contracts

## REVENUE STREAM

- Direct Sales (E-commerce, retail stores)
- B2B Partnerships (Military, NGOs, hospitals)
- Subscription Model (Premium tracking & analytics)
- Advertisements & Sponsorships (Fitness & health brands)

## CUSTOMER SEGMENTS

- 👉 Primary Users:
- Visually impaired individuals
  - Missing-prone populations (children, elderly, dementia patients)
  - Fitness-conscious users & athletes
  - Military personnel (Army, BSF, Navy, Air Force)

- 👉 B2B Clients:
- NGOs & Elderly Care Centers
  - Schools & Parents Associations
  - Defense & Security Agencies



# Business Model

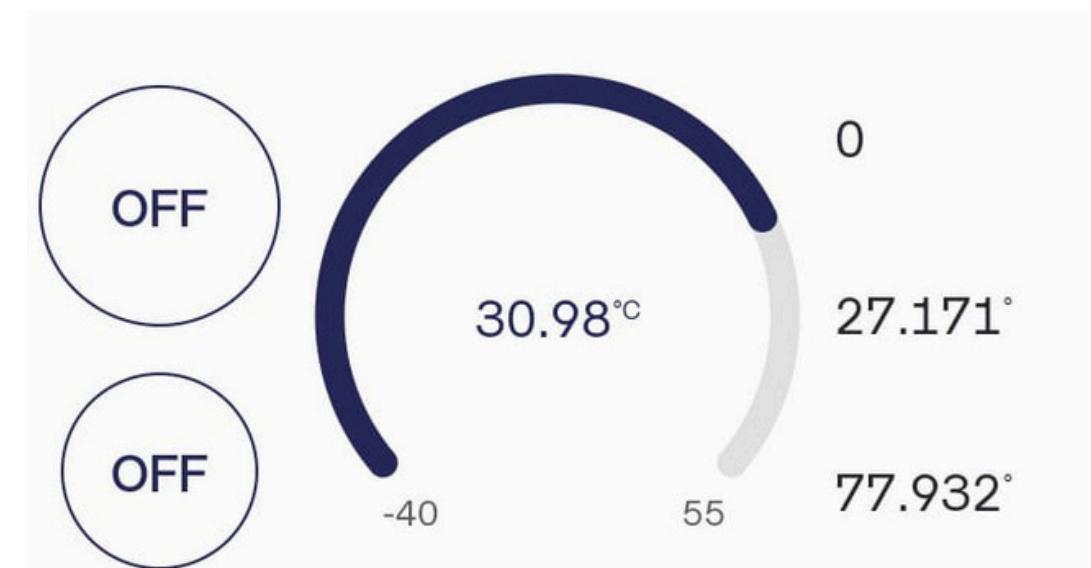
Target Segment	Total Market Size (TAM)	Serviceable Market (SAM)	Obtainable Market (SOM)	Key Features Required
Indian Army (Military, BSF, Navy, Air Force)	2.5 million personnel	1 million potential users	200K users initially	GPS tracking, terrain-based navigation, fatigue monitoring
Children (Safety & Tracking)	300 million children	50 million high-risk (urban areas)	5 million adopters initially	Real-time location tracking, geofencing alerts, SOS feature
Dementia Patients (Elderly Care)	4 million+ cases in India	1.5 million require monitoring	500K users initially	Memory loss alerts, caregiver tracking, emergency SOS
Young People (Fitness & Navigation)	400 million fitness-conscious users	100 million potential buyers	10 million early adopters	Step count, calorie tracking, AI-based fitness coaching

## Revenue Streams

- Direct Sales – E-commerce & Retail (Amazon, Flipkart, Decathlon)
- B2B Partnerships – Military, NGOs, Elderly Care Centers
- Subscription Model – Premium tracking & analytics features
- Advertisements & Sponsorships – Collaborations with fitness & health brands



# Project idea Design



<https://www.google.com/maps/search/?a...>

● Standing Still



# Meet the Smart Shoe Team

Our team consists of a dedicated leader and three key members, each with specialized roles to drive the Smart Shoe project forward.



**Er. Vyom Kulshreshtha**  
Associate professor  
**Mentor**



**Abhishek Kaushik**  
Application Programmer &  
AI management



**Rohit Shakyavaar**  
Resource Management



**Saurabh Pandey**  
Circuit designer & application  
management



# THANK YOU

We appreciate your time and consideration.  
Together, we can create a safer future for our  
loved ones.

