



- PROBLEM STATEMENT ID : OPEN INNOVATION
- TEAM NAME : NEURO VISION
- TEAM ID : HK - 206
- TEAM MEMBERS : ANSH JOHRI  
SASWAT KUMAR DAS  
SACHIDANAND PATHAK



## PROBLEM:

**HEALTHCARE SYSTEMS DIAGNOSE DISEASES TOO LATE, IGNORE ENVIRONMENTAL HEALTH RISKS, AND LACK INTEGRATED ASSISTIVE SOLUTIONS FOR THE VISUALLY IMPAIRED.**

## SOLUTION:

**NEUROVISION IS AN AI-POWERED UNIFIED PLATFORM THAT DETECTS EARLY DISEASE RISK, INTEGRATES ENVIRONMENTAL HEALTH INTELLIGENCE, AND PROVIDES SMART VISION ASSISTANCE — TRANSFORMING HEALTHCARE FROM REACTIVE TREATMENT TO PROACTIVE PREVENTION.**



## FLOW OF SOLUTION

- DATA INPUT
- AI SCAN ANALYSIS
- ENVIRONMENTAL RISK INTEGRATION
- MULTI-MODAL RISK ENGINE
- INSIGHTS & ALERTS
- ASSISTIVE SUPPORT
- DOCTOR VALIDATION
- CONTINUOUS LEARNING

## APPROACH

- DATA COLLECTION  
MEDICAL IMAGES + ENVIRONMENTAL DATA
- MODEL DEVELOPMENT
- TRAIN AI FOR DISEASE DETECTION
- MULTI-MODAL INTEGRATION  
COMBINE SCANS + ENVIRONMENT + SYMPTOMS
- APP & DASHBOARD DEVELOPMENT
- BUILD USER INTERFACE & ALERTS
- TESTING & VALIDATION
- ACCURACY TESTING & DOCTOR FEEDBACK
- DEPLOYMENT & SCALING
- CLOUD DEPLOYMENT & MONITORING



## TECH STACK

### ◆ FRONTEND

- REACT.JS / NEXT.JS (WEB)
- FLUTTER OR REACT NATIVE (MOBILE)
- TAILWIND CSS / MATERIAL UI
- WEB SPEECH API (ACCESSIBILITY)

### ◆ AI & MACHINE LEARNING

- PYTHON
- TENSORFLOW / PYTORCH
- OPENCV (IMAGE PROCESSING)
- SCIKIT-LEARN (RISK MODELING)
- RESNET / EFFICIENTNET (DETECTION MODELS)
- GRAD-CAM (EXPLAINABLE AI)

### ◆ ENVIRONMENTAL INTEGRATION

- AQI & POLLUTION APIs
- GPS & GEOLOCATION DATA
- REAL-TIME ENVIRONMENTAL MONITORING

### ◆ BACKEND

- PYTHON (FASTAPI / DJANGO)
- NODE.JS (EXPRESS)
- REST APIs



## 🧠 UNIQUENESS OF NEUROVISION

### **Unified Platform**

Combines medical diagnosis, environmental health insights, and assistive technology in one system.

### **Preventive Healthcare Focus**

Moves from late diagnosis to early risk detection and prevention.

### **Multi-Modal Health Analysis**

Uses scans, environmental data, and symptoms together for accurate insights.

### **Accessibility Integration**

Supports visually impaired users within the same healthcare ecosystem.



# Innovation Factors of NeuroVision

## ✓ 1. Environmental–Health Intelligence Integration

First-level integration of AQI, pollution, UV, and allergens with medical AI for risk prediction.

## ✓ 2. Multi-Modal AI Risk Engine

Combines medical scans, environmental exposure, and patient symptoms for smarter predictions.

## ✓ 3. Preventive Risk Scoring System

Provides early risk alerts and probability-based insights instead of only disease detection.

## ✓ 4. Built-in Assistive AI for Visually Impaired

Object detection, text reading, and voice navigation within a healthcare platform.

## ✓ 5. Explainable AI (XAI)

Uses heatmaps and confidence scores for transparent, trustworthy decisions.

## ✓ 6. Doctor-in-the-Loop Model

AI supports doctors rather than replacing them, improving reliability and ethics.



## 🧠 FEASIBILITY

### ✓ EXISTING TECHNOLOGY

AI, cloud computing, and environmental data APIs are already available.

### ✓ DATA AVAILABILITY

Public medical datasets and AQI data support training and testing.

### ✓ STRONG MARKET NEED

Rising pollution, vision disorders, and demand for preventive healthcare.

### ✓ SCALABLE IMPLEMENTATION

Can be built in phases and deployed gradually.

## ⚠ CHALLENGES

### ◆ MEDICAL DATA PRIVACY & SECURITY

Requires encryption, consent, and secure storage.

### ◆ ACCESS TO CLINICAL DATA

Needs hospital partnerships for high-quality training data.

### ◆ CLINICAL TRUST & VALIDATION

Doctors must validate AI results for adoption.

### ◆ REGULATORY COMPLIANCE

Healthcare solutions must follow medical guidelines.

### ◆ ACCURACY & BIAS CONTROL

Requires diverse data and continuous improvement.



## RESEARCH

- Studies show AI-based medical imaging improves early detection of eye diseases and neurological abnormalities.
- Research confirms air pollution and UV exposure contribute to vision and neurological health problems.
- Computer vision and assistive AI tools enhance independence for visually impaired individuals.
- Preventive healthcare models reduce treatment delays and improve patient outcomes.



## KEY REFERENCE



### AI IN MEDICAL IMAGING

Deep learning models (CNNs) for retinal disease and MRI analysis.



### ENVIRONMENTAL HEALTH

#### STUDIES

WHO & environmental research linking pollution to eye and neurological disorders.



### ASSISTIVE VISION TECHNOLOGY

Computer vision and text-to-speech systems for accessibility.



### EXPLAINABLE & ETHICAL AI

Research promoting transparency and doctor-in-the-loop decision support.