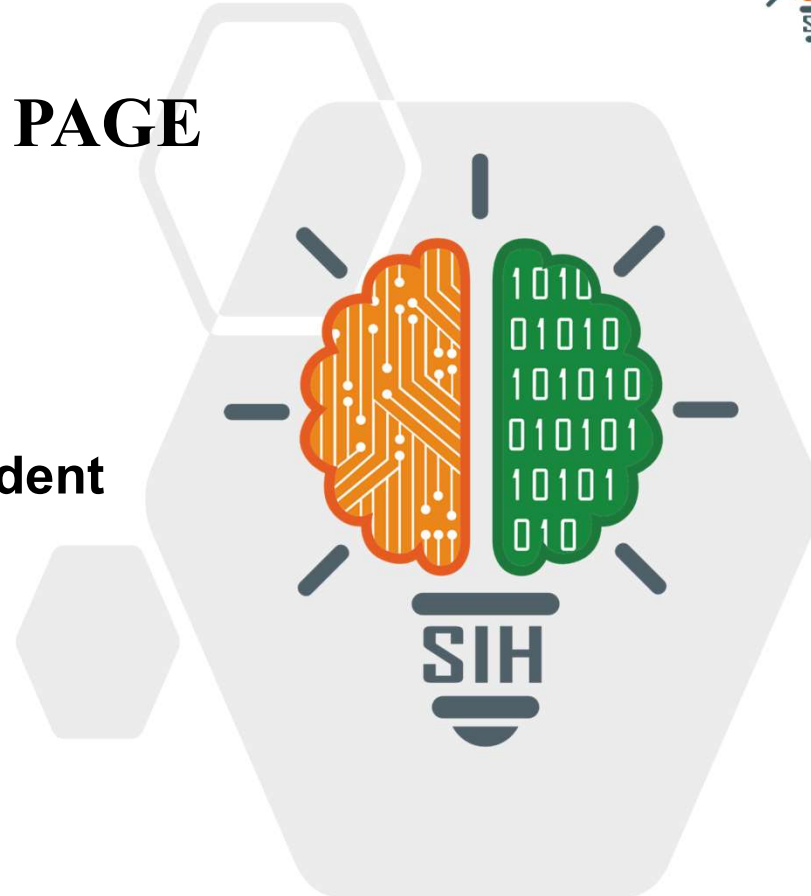# SMART INDIA HACKATHON 2024

TITLE PAGE

- **Problem Statement ID – SIH1540**

- **Problem Statement Title- Student Innovation**

- **Theme- Smart Automation**

- **PS Category- Hardware**

AI Enabled smart glasses

❖ **The goal of AI-enabled smart glasses for blind people is to simplify daily activities by providing real-time audio descriptions**

- Real-time audio descriptions of the wearer's surroundings, text-to-speech for reading documents, and voice-controlled navigation.

- All integrated with microphones and speakers, the smart glasses enhance accessibility and independence, making daily life easier for blind people.

- The innovation and uniqueness of the project lie in its integration of AI with smart glasses to provide real-time audio descriptions, text-to-speech functionality, and voice-guided navigation. This hands-free system is designed to greatly enhance daily life for users.

TECHNICAL APPROACH

- **Programming Languages**: Python (for AI, machine learning and raspberry pi) and c/c++.
  Frameworks: TensorFlow or PyTorch (for AI and machine learning models), Raspbian
  Hardware: wearable frame, Raspberry pi, camera, microphone, speaker/earphone, power source

Input Acquisition ⟶ Data Processing ⟶ AI Analysis ⟶ Decision Making

Learning and Adaptation ⟵ User Interaction ⟵ Output Generation

FEASIBILITY AND VIABILITY

- Building AI smart glasses for the blind is doable on a student budget. With parts like a Raspberry Pi and free software.
- Challenges include fitting components into a comfortable frame, managing battery life, and ensuring sufficient processing power. Integrating complex AI and voice software and maintaining durability are also potential risks. Careful design and testing are essential.

Strategies to overcome the above challenges

→Use a compact frame.

→Choose efficient parts and a high-capacity battery.

→Optimize AI models.

→Use reliable software and materials.

→Test extensively.

IMPACT AND BENEFITS

- AI smart glasses can greatly enhance independence for blind users by aiding navigation, reading text, and recognizing objects. This technology promotes self-reliance and improves daily life by making tasks easier and increasing confidence.
- Social benefits: Increases independence and inclusion for blind individuals.
- Economic benefits: Lowers care costs and provides a cost-effective assistive solution.

RESEARCH AND REFERENCES

- **Smart Glasses for the Visually Impaired People- a research paper by Maghfirah Ali and Tong Boon Tang**
  Link:
  https://www.researchgate.net/publication/304802688_Smart_Glasses_for_the_Visually_Impaired_People

- **An innovative smart glass for blind people using artificial intelligence-a research paper by Shantappa G. Gollagi, Kalyan Bamane, Manish Patil and B. Ankali**
  Link:
  https://www.researchgate.net/publication/371978055_An_innovative_smart_glass_for_blind_people_using_artificial_intelligence

- **ChatGPT - For general information and assistance and for help with technology explanations and research guidance**.