Project Nayaan

Name of the Invention:

NAYAAN: A step up device for the Blind and Visually Impaired

What is NAYAAN?

NAYAAN is designed for the field or application area of assistive technology for blind and visually impaired individuals. The primary purpose of NAYAAN is to help blind and visually impaired people to read the traditional books, papers, Magazines, etc., and improve the daily lives of people with the help guide users in their day-to-day task with the help of NAIVA (Nayaan Artificial Intelligent Voice Assistant).

NAYAAN specifically targets the needs of blind and visually impaired people, aiming to provide them with increased independence, improved mobility, and expanded access to information.

Features of NAYAAN

Nayaan Document Reader

The Nayaan Document Reader is a feature that allows blind and visually impaired users to read text from various sources, such as books, documents, files, magazines, and newspapers. The feature uses the device's integrated camera to capture a picture of the document, which is then processed by an OCR (Optical Character Recognition) engine to extract the text. The extracted text is then converted into an audio format using a text-to-speech library. The resulting audio can be conveniently listened to by the user through the device's built-in speaker, a Bluetooth-enabled earphone or speaker, or earphones equipped with a 3.5mm audio jack.

NayaanSight+

NayaanSight+ is a feature that assists blind and visually impaired users in their daily tasks. It uses NAIVA (Nayaan Artificial Intelligence Vision Assistant), which utilizes an object detection machine learning module to identify objects and provide alerts to the user. For example, if the user is walking down the street, NAIVA can detect and identify oncoming cars, pedestrians, and other obstacles. This can help the user to avoid accidents and stay safe.

Nayaan-Audiobooks

Nayaan-Audiobooks is an innovative feature that improves accessibility for blind and visually impaired individuals by providing easier access to audiobooks. Nayaan-Audiobooks features a simplified audio control system and bookmarking functionality that make it a convenient and accessible way to listen to audiobooks. For example, users can easily skip forward

or backward by chapter or by time, and they can create bookmarks to mark their place in an audiobook.

Collapsible-Stick

The Nayaan collapsible stick is a unique feature that allows a stick or cane to expand and collapse with a single button. This feature is designed to provide convenience and ease of use for individuals with mobility or visual impairments who rely on a stick or cane for assistance with navigation and mobility. The Nayaan collapsible stick can be easily stored in a backpack or purse, making it easy to take with you wherever you go.

Our Objective:

1. Provide a software and hardware solution that allows visually impaired and blind people to read text and detect objects in their environment.
2. Develop a user-friendly interface that is easy to use for people with visual impairments.
3. Incorporate the latest OCR and object detection technologies to ensure that the solution is accurate and reliable.
4. Test and evaluate the solution with visually impaired and blind users to ensure that it meets their needs.
5. Market and distribute the solution to visually impaired and blind people around the world.

Vision

To create a world where blind and visually impaired people have the same opportunities as everyone else.

Mission

To develop and deploy AI-powered technologies that can help blind and visually impaired people live more independent and fulfilling lives. Specifically, we will focus on developing technologies that can:

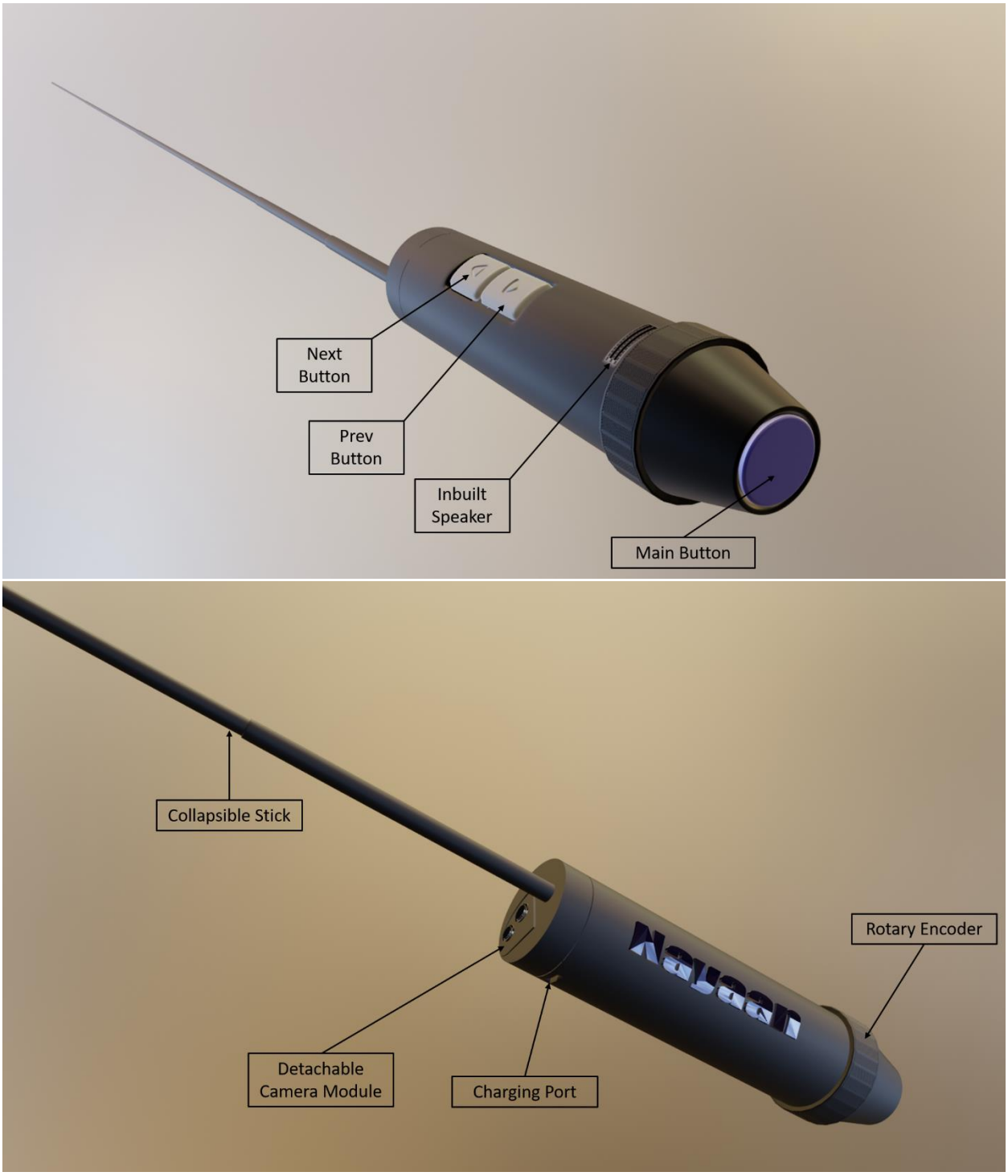
Improve navigation: We will develop AI-powered navigation tools that can help blind and visually impaired people get around safely and independently.

Provide access to information: We will develop AI-powered tools that can help blind and visually impaired people access information, such as books, newspapers, and websites.

Enhance communication: We will develop AI-powered tools that can help blind and visually impaired people communicate with others, such as video chat and text-to-speech software.

We believe that AI has the potential to revolutionize the way that blind and visually impaired people live. By developing and deploying AI-powered technologies, we can help to create a more inclusive and equitable world for everyone.

The concept design of the device:



We have performed tested features of the device here is link of demonstration

Click here

Tech Stack

Hardware

1. Raspberry Pi Compute Module 4 (CM4) - 4GB RAM, 32GB eMMC Google coral USB Accelerator 2.4/5.0GHz Wi-Fi & Bluetooth 5.0
2. Raspberry Pi Compute Module 4 IO board
3. Battery unit
4. Raspberry Pi 6 mm Wide Angle Lens for Pi High Quality Camera

Software

1. TensorFlow
2. pyTorch
3. Java
4. gTTS
5. Custom Linux distro

There might be few changes in the tech stack in future for better optimization