empowering-the-blind-to-live-independently

Omdena

ROMANIA

AGENDA

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Omdena

Education through Collaborating on Real World Problems

The mission of Omdena Local Chapters is to run open-source AI projects to solve challenges faced by local communities

- Chapters in 50+ countries
- Starting 10+ projects per month
- 80+ collaborators per project

Omdena Local Chapter Member Benefits

- Learn how real-world data science projects are solved by getting hands-on experience
- Develop your DS/AI skills and showcase them through open-source solutions
- Network with chapter members and leads from 50+ different countries
- Preferential selection to the Omdena core challenges and future access to Omdena members' benefit platform.

PROBLEM STATEMENT

The blind community faces significant challenges in achieving equal access to education, employment, and social services. Limited resources, lack of infrastructure, and negative attitudes towards disability often create barriers to the full integration of blind individuals in society, leading to lower rates of employment, higher levels of poverty, and limited opportunities for personal development and growth. As a result, there is a pressing need to address these systemic issues and empower the blind community to achieve their full potential in Romania.

Project goals

The Omdena Romania Chapter team aims to develop a Computer Vision model that will identify the surroundings around a person that has a mobile phone with them and help them walk through the world.
The project's primary goal is to accurately predict objects in the surroundings, people, and cars, and inform the user about all of them in real-time.
The secondary goal is to help them in their daily indoor tasks such as shopping, finding clothes, choosing colors, managing money, finding product details, and indoor nagivation.

- Web App that works in real-time
- GitHub Repo with open-source code;
- Curated dataset hosted in AWS/Google/Kaggle/HuggingFace for open access;

LEARNING OUTCOMES

- Collect and create images for a computer vision model
- Extract relevant features from the images
- Train and implement a computer vision model;
- Analyse and improve the model
- Deploy a web app
- Teamwork;
- Project Management;
- Learn about blind people’s lifestyles;

TASKS

Task 1 - Research Previous Work & Data Collection (similar apps, useful datasets, etc.)

Task 2 - Data Collection (datasets, images, videos for each subtask)

Task 3 - EDA

Task 4 - Preprocessing & Data Augmentation

Task 5 - Model Development

Task 6 - Model Training

Task 7 - Model Analysis & Interpretation

Task 8 - App Development

SUBTASKS

1. **Object recognition**: The app should be able to identify common objects and their locations, such as doors, chairs, and stairs, and provide spoken or tactile feedback to the user.
2. **Scene description**: The app should be able to provide a description of the user's surroundings, including information about the layout of the environment, such as the presence of obstacles or changes in elevation.
3. **Indoor navigation:** The app could use computer vision and machine learning to create a detailed map of an indoor space, allowing the user to navigate more effectively and independently.
4. **Color recognition**: The app could identify and describe colors, allowing users to differentiate between different colored objects and navigate their environment more effectively.
5. **Bar code and QR code recognition**: The app could scan bar codes and QR codes and provide the user with information about products or locations, such as prices, directions, or store hours.
6. **Currency recognition**: The app could identify different types of currency and provide the user with feedback about the denomination, enabling them to manage their finances more effectively.
7. **Navigation assistance:** The app should provide audio or tactile feedback to help the user navigate from one location to another, using information about their surroundings to provide turn-by-turn directions.
8. **Spoken feedback**: The app should be able to give verbal feedback to the blind person in order to communicate the objects and surroundings easily.
9. **Voice control**: The app could allow the user to control its functions using voice commands, providing a hands-free way to interact with the technology.