Indian Currency Recognition for Visually Impaired People

First-Level Project Presentation

Kevin S Monachan

Department of MCA

Guide: **Smt. Premy P Jacob**

Introduction

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This project is designed to assist visually impaired individuals in recognizing and managing Indian currency notes independently. It offers an easy-to-use system with **voice-guided support** and **audio feedback**, allowing users to identify notes and keep track of their total amount without visual assistance.

Problem Statement

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Need: An accessible, user-friendly solution enabling independent recognition and handling of Indian currency notes through non-visual methods.

Project Objective

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- Provide a reliable currency recognition service
- Enable real-time auditory feedback
- Maintain a digital virtual purse
- Offer an accessible, keyboard- and voice-driven interface
- Enhance financial independence and security

Goal: To develop an accessible system that empowers users to recognize and manage currency independently and securely.

Literature Survey

Papper Title	Description	Advantage	Disadvantage
A Robust System for Indian Paper Currency Recognition using Deep Learning	Uses a fine-tuned VGG-16 CNN model with transfer learning and data augmentation for robust currency note recognition	High accuracy and robustness in real-world conditions.	Computationally intensive, hard to deploy on low-power devices.
Deep Learning Based Paper Currency Recognition and Verification	A custom **Convolutional Neural Network (CNN)** that automatically learns features from raw pixels to recognize and classify different currency denominations.	Efficient training via transfer learning.	Heavy model not suitable for embedded systems.
SURF-Based Indian Currency Recognition	A system that identifies Indian banknotes by extracting and matching **Speeded Up Robust Features (SURF)** against a database of genuine notes.	Fast processing with low resource requirements.	The system's performance depends heavily on the quality of handcrafted features and may be less robust to complex variations than deep learning model
A Survey on Paper Currency Recognition Systems	Reviews and analyzes various currency recognition techniques across the research pipeline.	Reviews and analyzes various currency recognition techniques across the research pipeline.	Does not propose new methods or improvements.

Existing System Limitations

Current System Issues

- Relies on faded tactile marks
- Depends on subtle differences in size and texture
- Limits user independence and privacy

Proposed System

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- Deep learning model based on ResNet architecture
- Currency recognition via webcam or image upload
- Voice command integration using Web Speech API
- Keyboard-driven interface requiring no mouse
- Continuous audio feedback for seamless interaction
- Virtual purse to track total currency amount

Tech Stack:

TensorFlow, ResNet, HTML, CSS, JavaScript, Web Speech API, Flask

Methodology

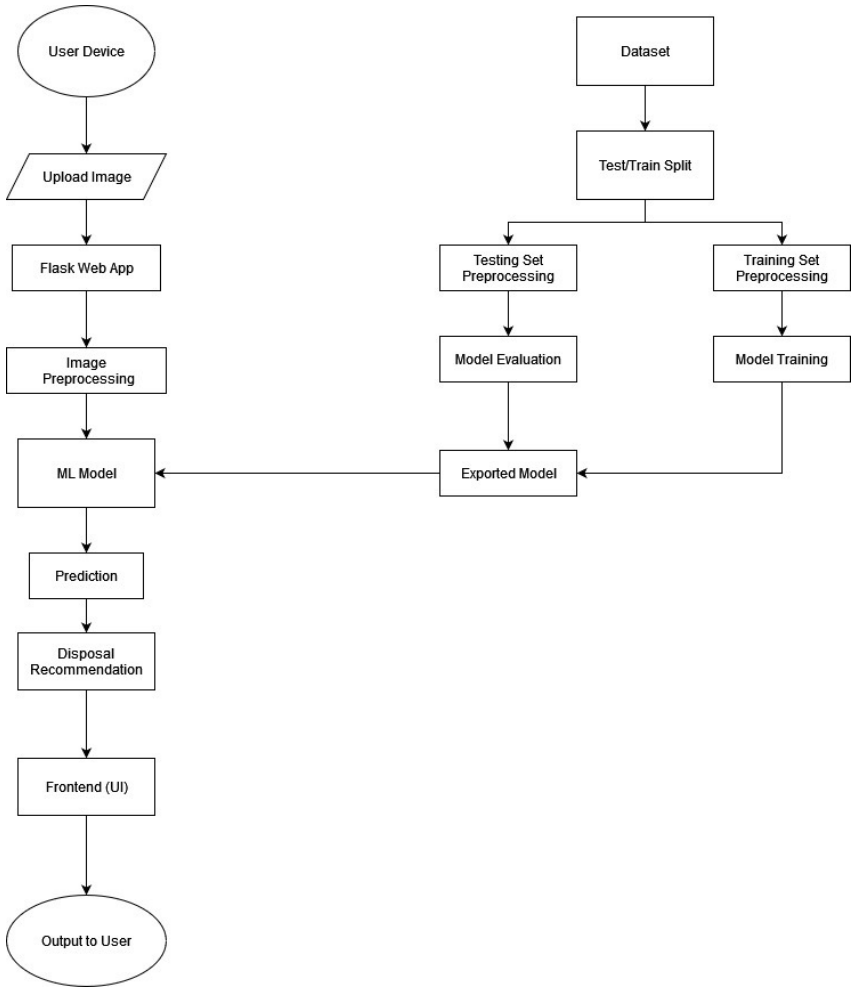
Core Methodologies

- Deep Learning with Transfer Learning
- ResNeXt-50(CNN-based)

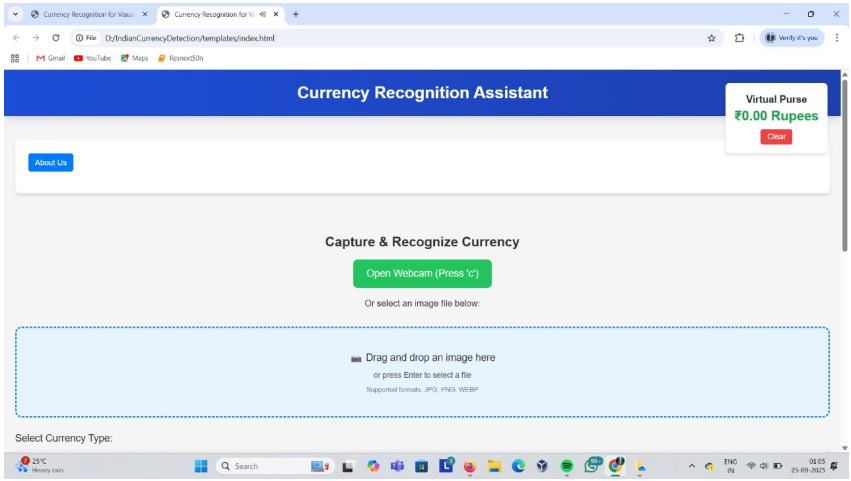
Project Development Steps

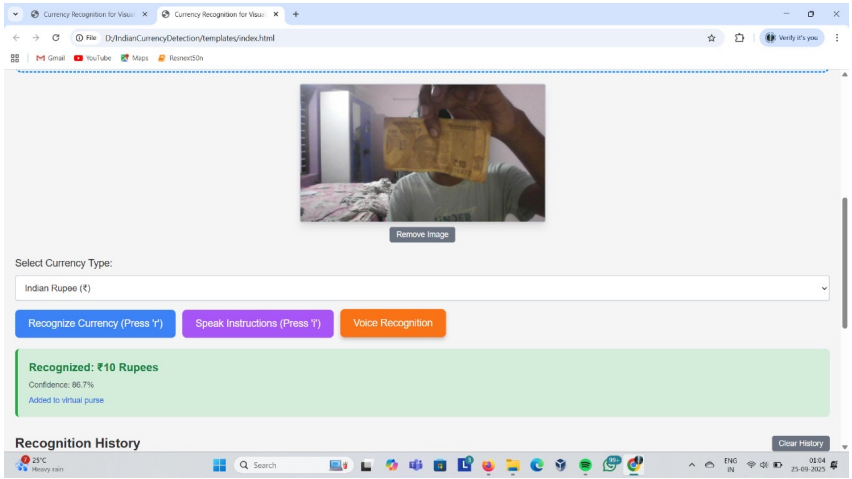
- Dataset Preparation
- Model Development
- Training & Validation
- Integration
- Deployment

System Design/Architecture



Implementation





System Configuration

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Hardware Configuration

- **Operating System:** Windows
- **Processor:** AMD Ryzen 5 5600H
- **Memory:** 8GB RAM

Software Configuration

- **Language:** Python
- **Machine Learning Library:** TensorFlow
- **Model Architecture:** ResNet (CNN)
- **Front End:** HTML, CSS3, JavaScript, Web Speech API
- **Back End:** Python Flask

Conclusion

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This project addresses a critical need in society by empowering visually impaired individuals to independently identify and manage currency. It promotes financial autonomy, reduces reliance on others, and enhances the dignity and confidence of users in their daily transactions.

By focusing on accessibility, usability, and inclusion, the system contributes meaningfully toward building a more equitable and supportive digital environment for all.

Thank You!