

Currency Recognition and Conversion

A PROPOSAL PRESENTED BY

A.H.D. ABEYWICKRAMA

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INTRODUCTION

Currency recognition and conversion play crucial roles in various financial and commercial sectors. In this project, the aim is to develop an image processing system capable of recognizing currency notes from different countries and converting them into another currency type. Traditional approaches to currency recognition often involve intricate algorithms and machine learning models. However, this project focuses solely on utilizing image processing techniques without the need for complex classification or computer vision models.

OBJECTIVES

1. Develop a robust image processing pipeline capable of extracting relevant features from currency note images.
2. Implement algorithms to recognize key attributes such as currency denomination, symbols, and patterns.
3. Design algorithms for currency conversion based on recognized features and predefined exchange rates.
4. Optimize the processing pipeline for efficiency and accuracy.
5. Validate the system's performance through extensive testing with various currency notes.

APPROACH

1. Preprocessing:

- Normalize images to enhance contrast and reduce noise.
- Perform edge detection to identify prominent features.
- Apply morphological operations for image enhancement and noise reduction.

2. Feature Extraction:

- Extract key features such as serial numbers, denomination numbers, and unique symbols.
- Utilize techniques like template matching and shape detection to identify specific currency attributes.

3. Currency Recognition:

- Implement algorithms to analyze extracted features and determine the currency type.

- Develop rules-based systems or decision trees to match features with known patterns of different currencies.

4. Currency Conversion:

- Establish a database or lookup table containing exchange rates between different currencies.
- Use recognized currency attributes to determine the original denomination.
- Apply the appropriate conversion rate to calculate the equivalent amount in the desired currency.

5. Optimization:

- Fine-tune algorithms and parameters to improve accuracy and efficiency.
- Implement parallel processing or optimization techniques to enhance performance.

6. Testing and Validation:

- Evaluate the system's performance using a diverse dataset of currency notes from different countries.
- Conduct rigorous testing to ensure accurate recognition and conversion across various conditions, such as different lighting and orientations.

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