Foreign Bill Detection, Identification and Currency Conversion Using SIFT

Project Goals

Detect, locate and identify paper currency notes in an image. The value of detected notes is reported to the user in USD.

Data Flow

Our mobile app uploads a smart phone camera photo to a LAMP server where it is processed. The server returns an image with the matched bills labeled, converted to USD and totalled.

The Algorithm

Preprocessing The Golden Samples

- For each bill to detect
- 500 features per bill
- Database

Bill Detection Algorithm

- For each bill in database
- SIFT 3000 features
- Feature 2 Match + ratio test + duplicate removal on parallel cores

- For each bill in database
- 400 RANSAC iterations
- Estimate Homography + Centroid Check + Find Inliers + Save H Transform w/ Max # of Inliers
- Find Bill w/ Max # of Inliers
- If Max # of Inliers > 10
  - No: Write UI on Input
  - Yes: No More Bills Detected In Image
- Remove Inlier Features from Each Bill Feature Match
- Store Bill Details

Results

14 bills (front & back) can be detected, distinguished and totalled. Up to 12 bills can be detected at once. Overlapping and similar bills can been properly detected.