EE 368 Final Project
Automated Coin Recognition with ANDROID Phone

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Project Goal:

Counting loose coins to determine their monetary value can be a tedious and time-consuming process that could be greatly aided by a mobile application that could take an input of a scene with coins and output the amount of money. The algorithm would function by taking the input image and thresholding it to separate foreground from background. As a start, the assumption will be made that there are no overlapping coins and thus we would expect a coin to appear elliptical based on the angle at which the image was taken. The algorithm should be able to distinguish coins from other non-elliptical structures in the scene such as a pencil. The Major Axis, Minor Axis, and Centroid of each region in the foreground could be obtained using the regionprops command and ellipse with the corresponding properties could be generated. The percent overlap between the generated ellipse and the actual region could be determined and the region could be deemed to be a coin if it the percent exceeds some threshold. Once the coins in the scene have been identified, they could be compared to a training set of images using a feature detection and matching algorithm. The training set of images would include both heads and tails sides of the coins. Once each region has been identified with a corresponding coin the total monetary value could be calculated and output on the screen. The algorithm would first be tested using MATLAB with various images of coins taken with a camera and then be implemented on the ANDROID phone.

References

[1] Reinhold Huber, Herbert Ramoser , Konrad Mayer , Harald Penz , Michael Rubik, Classification of coins using an eigenspace approach, *Pattern Recognition Letters*, v.26 n.1, p.61-75, 1 January 2005

[2] Shatrughan Modi, Seema Bawa, Automated Coin Recognition System using ANN, *International Journal of Computer Applications*, v. 26 n.4, July 2011

[3] J. Prakash, K. Rajesh, A Novel Approach for Coin Identification using Eigenvalues of Covariance Matrix, Hough Transform and Raster Scan Algorithms, *World Academy of Science, Engineering and Technology*, vol. 44, 2008