EE368: Final Project Proposal

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1. **Title: Credit card processing using cell phone camera images**

2. **Motivation:**

In the recent past the use of "smart" mobile phones has exploded world-wide. With the advent of development platforms like Android and iPhone, there is a tremendous effort involved in developing applications for various commercial needs. Additionally, ecommerce transactions over mobile platforms have also increased. Credit card processing using mobiles phones is a novel usage of this technology which is especially beneficial to small vendors & individual sellers. A survey of the present technology reveals that there are many companies that provide credit card processing using mobile phones ([1],[2],[3]). However, to the best of my knowledge, all these applications require the interface to an external card reader or use a payment processing system (eg. PayPal, Google etc.). Since most of the smart phones are packaged with an in-built camera, the proposal of this project is to develop an application that can take images of credit card and infer the details to process the transaction. With this application, there is no need for any external hardware interface. Additionally, this can be extended to read other cards as well. If this technology can be productized, it is believed that there is a huge potential for developing a commercial application to process cards.

3. **Methods & Goals:**

A cell phone equipped with a camera will be used to acquire the images of the credit card. Phase 1: The images will be imported in MATLAB for further processing. Various image processing algorithms taught in the class will be applied to extract information from the credit card. For example, binarization to separate background from foreground information, segmentation to identify different regions in the image, morphological image processing to extract text and other features from the image and any other technology taught in the future lectures will be used for processing the image. The extracted information: Name, credit card number, date of expiration, verification number (on the back), signature, logo (visa, master card etc.) will be printed as output of the image processing. The algorithms will be tested using various credit cards, illumination conditions (day/night, with/without flash etc.). If possible, multiple cameras (hence different cameras in different phones) will also be tested to check if the algorithms are robust enough to handle a variety of images. Phase 2: If time permits, the technology will be ported on camera phone using the Android platform and demonstrated to read & process the credit-card. This is a stretch goal for this project.

4. **References:**

[1] A comparison of top 10 credit card processing solutions on mobile platforms:
http://credit-card-processing-review.toptenreviews.com/mobile-credit-card-processing/
[2] An alternative to hardware credit card readers, but information is stored in cloud, which may raise security concerns:
http://www.google.com/wallet/what-is-google-wallet.html
[3] There are many credit card reader demos on youtube, here are a couple of them:
http://www.youtube.com/watch?v=LD_cSDngBXo&feature=related
http://www.youtube.com/watch?v=942ElWWUChA