Project: Mobile face recognition and audio representation for visually impaired users

Summary:
Real time mobile face detection and recognition, then representation of face/image with sound, for visually impaired people.

Project Goal:

- Build a iPhone App for visually impaired people which can help user detecting face in realtime by recording through back/front camera. Also have the capability of classify gender based on faces.

- Another aspect of the project is find a proper way to represent images/faces with sound that represent the colour of the point of touch location within images, so that visually impaired uses can have a rough idea of the shape of camera captured objects, by scrubbing finger back and forth across screen, and listen to the modulated sound output.

Stretch Goals:

- Enable face recognition with faces which exists in the build-in model dataset.

- Enable user to train the model with new faces on mobile device, add new face data to the database overtime.

- Do above tasks locally on iPhone without need of any network connection or any kind of backend server.
Work items:

- Study different face/gender detection and recognition algorithms [ref.1], implement and compare their performances in term of speed and accuracy, then chose one that runs the best on iOS platform without requiring latest generation of hardware (acceptable speed on iPhone 5 or even 4).

- Try different image processing [ref.2, ref.3] and feature extraction methods to pre-process images before feeding it to synthesised audio representation, in hope of improving usability.

- Study different ways of representing images with sound [ref. 4], chose one that is best for mobile use.

- Build an iPhone App with the study result and maybe submit to AppStore.

Platform:

The project will be build natively on iPhone with iOS SDK and Objective-C, together with openCV framework and C++ code for some of the image processing tasks that openCV already have good support of.

References:


