

EE 368 Project Proposal

Title: Face recognition for mobile phones.

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Description

As mobile phones are becoming increasingly powerful, security of the data stored in mobile phones like email addresses, sensitive documents, etc., becomes very important. Most of the current phones have password protection to address security. However, a face recognition scheme is much more secure and flexible as it provides distinctive print to gain access and also the user need not remember passwords. The goal of this project is to implement a face recognition application on the DROID phone, which could be used to unlock the phone or authorize a transaction when the registered user is recognized. In the considered context, we can assume the compared pictures are taken in similar conditions, with regard to the user position and facial expression. However the robustness of the application with respect to brightness will be tested.

Popular algorithms for face recognition include Independent Component Analysis (ICA) [1], Principal Component Analysis (PCA) and Template Matching. While numerous tests have been performed to compare these algorithms, their relative performances are strongly dependent on the conditions [3]. We will first profile their performances on Matlab. After analyzing the tradeoffs between performance of the algorithms and their complexity, we will then implement one face detection algorithm on the DROID phone, and possibly suggest a better performing algorithm than the already existing ones.

References

- [1] Hyvärinen, A (1999). Fast and Robust Fixed-Point Algorithms for Independent Component Analysis. *IEEE Transactions on Neural Networks*, 10(3), 626-634.
- [2] R. Brunelli, *Template Matching Techniques in Computer Vision: Theory and Practice*, Wiley, ISBN 978-0-470-51706-2, 2009
- [3] P. Jonathon Phillips, W. Todd Scruggs, Alice J. O'Toole: "FRVT 2006 and ICE 2006 Large-Scale Experimental Results," *IEEE Transactions on Pattern Analysis and Machine Intelligence*