Final Year Project Proposal
A Biometric Vein Scanner by means of Near Infra-Red absorption


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# Introduction

There has been extensive developments in the field of biometrics. The field is currently dominated by big players such as finger-print and facial feature recognition systems. Over the past few years there has been a vast number of aspects that are gaining momentum. One of these is the use of subcutaneous veins in the hand as a means of identification.

The benefit of such a system would be in the relative difficulty in accessing vein patterns. Because they are under the skin, a system employing this method of verification would be hard to fool.

Acquisition of such patterns involves the use of near-infra-red light. This light (typically of wavelengths between 880 nm and 940 nm) has the property that allows it to be absorbed by the blood contained in veins. By imaging the lit area with a camera sensitive to infra-red radiation the reflection will show a distinct pattern that can then be processed using digital signal processing methods.

# Background and Scope

The scope of this project is to develop the hardware to acquire dorsal (back of hand) vein images and then to process the results with the aim of extracting the biometric information.

Along with constructing the apparatus to acquire images, an API will be created to allow accessing the device and intermediate processing capabilities.

The project will not, however, cover the classification procedure which allows the matching of a capture pattern to a reference pattern already stored in the database.

# Ethics with Biometrics

While the classification is not part of the project it is important that care be taken in handling any experimental data that is obtained.

Although vein imaging is in it's infancy, the dorsal vein image processing approach is starting to experience a more rapid development community. There could be future prospects for extensive use of the technology in applications such as banking, healthcare and identification etc.

With this in mind, it is important to ensure that any data captured by the device while in the process of testing be disassociated from the identification of the participants. In order to cater for this, a random number will be assigned to any image captured by the device. The number will be the only point of reference for the image or derivatives of the image from that point on.

Names and identification will not be captured or recorded but skin colour may be recorded if experimentation reveals an outcome to justify such records. There is doubt, however, that there will be any effect on the scans due to skin colour. This is because the capture device makes use of near infra-red sensing which does shouldn't be influenced by skin pigmentation.

# Conclusion of Proposal

The basics of this project have been outlined above. A concerted effort will be made to ensure all experimental procedures during the project are ethical and adhere to the UCT Code for Research involving Human Subjects.