Biometric Standards, Performance, and Assurance Laboratory

Department of Industrial Technology
Purdue University

Effects of Illumination Changes on the Performance of Geometrix FaceVision® 3D FRS

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Overview

This evaluation examines the influence of three illumination levels on the performance of a 3D face recognition algorithm, specifically testing the significance between the illumination of verification attempts and the illumination of enrollment conditions.

Collected variables from the volunteer crew include age, gender, ethnicity, facial characteristics, and facial obstructions. Computed measures for this evaluation are: failure to enroll (FTE), failure to acquire (FTA), the match rate (FMR), and the false non-match rate (FMNR).

Experimental Setup

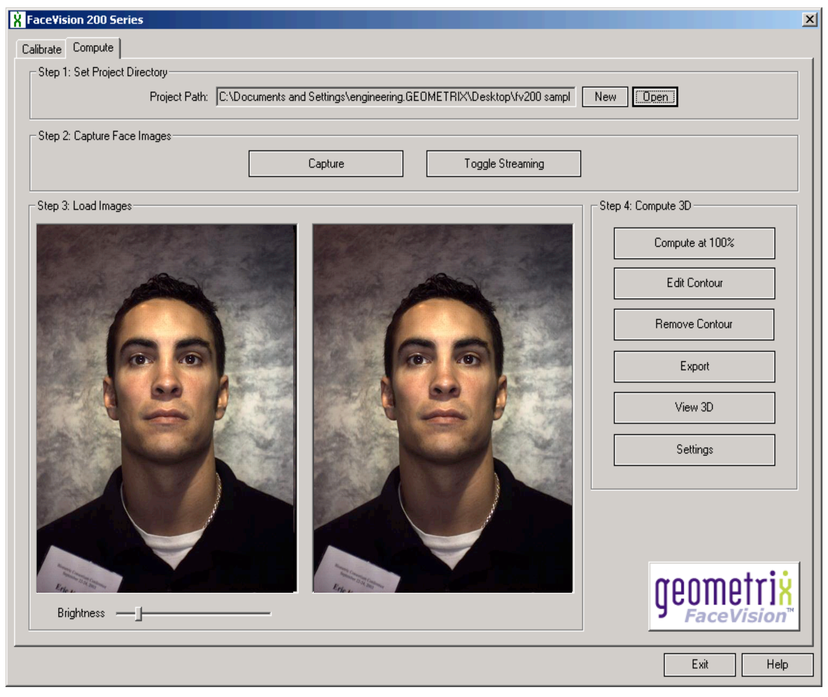
This research is taking place in the Biometric Standards, Performance and Assurance Laboratory and is evaluating the performance of Geormetrix FaceVision® in three illumination levels

- Low Light – referred to as enrollment condition 1, assumed to be 7 – 12 lux
- Medium Light – referred to as enrollment condition 3, assumed to be 800 – 815 lux
- High Light – referred to as enrollment condition 2, assumed to be 407 – 415 lux

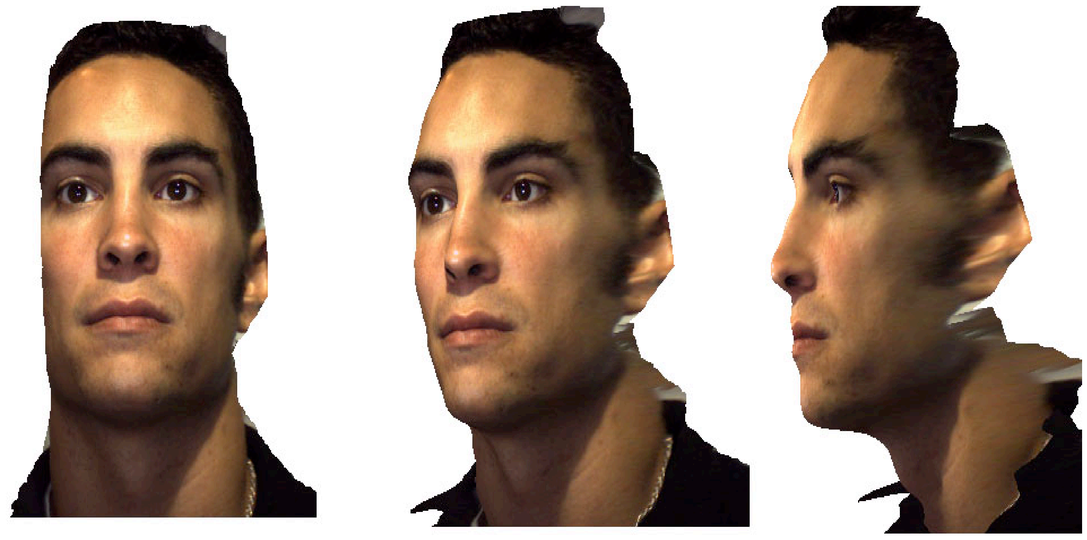
The light setup for this evaluation is composed of a three point lighting studio that is controlled by a dimmer switch and monitored by a broad range LUX/FC light meter.

Device – FaceVision 200

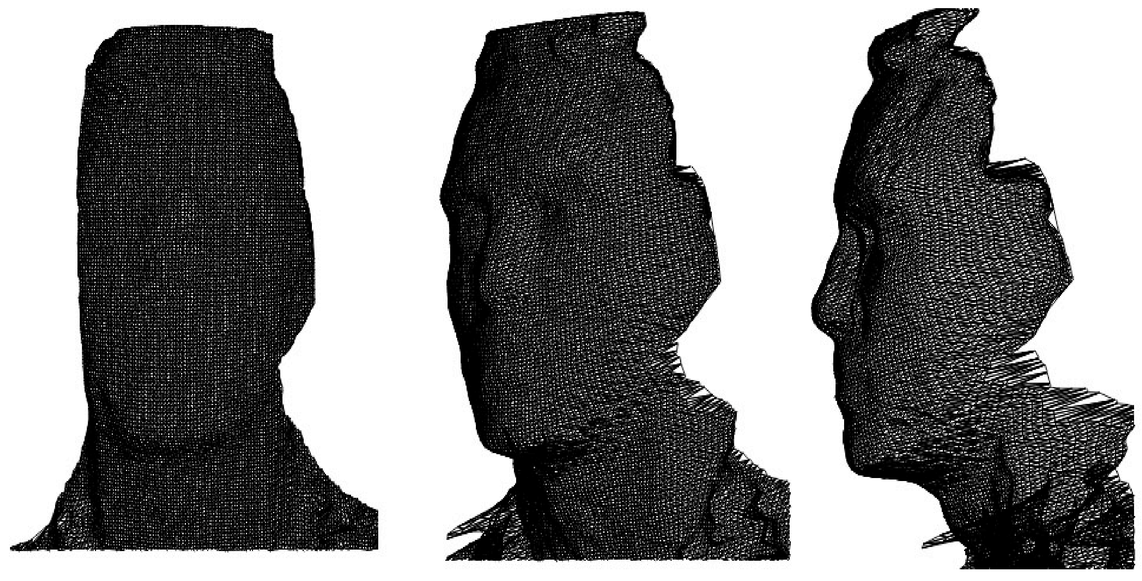
2D Enrollment Images



3D Facial Image Extraction



Textured Images



Wire Frame Models

Solid Models