RICHARD HOSHINO, National Institute of Informatics, Tokyo
Calibrated Confidence Scoring for Biometric Identification

Existing biometric identification systems, such as those used in trusted traveler programs, attempt to identify an individual from an enrollment database of n people. The output is either the name of an enrolled person, or a rejection message indicating that no match was found. Traditionally, no measure of confidence is given to the output; an individual is either granted or denied access.

In this presentation, we propose an extension to existing biometric systems by applying a calibration function to the n matching scores. We introduce a computationally-light calculation that can be applied either as a post-processing filter or embedded directly into an algorithm to yield perfectly calibrated probability-based scores. In addition to attaching a meaningful confidence measure to the output, the proposed methodology is also shown to improve the overall performance of a biometric system.

We apply our calibration theorem to an actual data set consisting of nearly 60,000 iris images. By comparing the detection error trade-off (DET) curves, we show that our score calibration post-processing filter reduces the area under the DET curve from 2.41 to 0.17, and reduces the equal error rate (EER) from 5.40% to 2.84%.

This is joint work with Dmitry Gorodnichy at the Canada Border Services Agency.