UNIVERSITI TEKNOLOGI MARA

FUSION OF LICENSE PLATE AND FACE RECOGNITION FOR SECURE PARKING

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Thesis submitted in fulfillment
of the requirements for the degree of
Master of Science

Faculty of Electrical Engineering

September 2013

AUTHOR'S DECLARATION

I declare that the work in this thesis was carried out in accordance with the regulations of Universiti Teknologi MARA. It is original and is the result of my own work, unless otherwise indicated or acknowledged as referenced work. This thesis has not been submitted to any other academic institution or non-academic institution for any degree or qualification.

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ABSTRACT

Integration of multimodal biometrics is one of the well known techniques for security enhancement. Hence, in this research the integration of car plate and face recognition as security enhancement in private parking area has been developed to ensure the car is driven by the authorized or registered owner. The methodology proposed is based on algorithms tested for feature extraction of plate and face recognition based on unconstrained minimum average correlation energy (UMACE) filter. Then, cryptosystem algorithm based on Hill Cipher and random number is implemented as encryption and decryption techniques as protection for registered users as stored in the database. The accuracy rate attained is based on implementation of decision fusion using AND rule during classification. Experiments attained a total success rate (TSR) of 96% during parking based on plate recognition only and over 99% TSR during exit based on fusion of plate and face recognition at PSR value of 10. Results confirmed that the proposed method is indeed suitable for security measure in a parking space. Additionally, the algorithms developed in this study are also validated and verified based on three performance measures namely genuine acceptance rate (GAR) for plate as 96% based on registered car plate during exit whilst face GAR of 80% for registered owner or user to be allowed to exit. As for impostors, the rejection rate (IRR) calculated is 100% as indicator of the specificity of impostors as well as prohibiting unregistered owner or user to proceed and exit.

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