VISVESVARAYA TECHNOLOGICAL UNIVERSITY

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PROJECT REPORT

On

"ILLUSIONPIN: SHOULDER-SURFING RESISTANT AUTHENTICATION USING HYBRID IMAGES"

Submitted by

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In partial fulfillment of the requirements for the degree of

BACHELOR OF ENGINEERING

In

INFORMATION SCIENCE AND ENGINEERING

Under the Guidance of

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ALVAS INSTITUTE OF ENGINEERING AND TECHNOLOGY

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CERTIFICATE

Certified that the project work entitled *"IllusionPIN: Shoulder-Surfing Resistant Authentication Using Hybrid Images"* is a bonafide work carried out by

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in partial fulfilment for the award of BACHELOR OF ENGINEERING in **INFORMATION SCIENCE AND ENGINEERING** of the **VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELGAUM** during the year 2019–2020. It is certified that all corrections/suggestions indicated for Internal Assessment have been incorporated in the report deposited in the departmental library. The project report has been approved as it satisfies the academic requirements in respect of project work prescribed for the Bachelor of Engineering Degree.

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ABSTRACT

The problem of shoulder-surfing attacks on authentication schemes is addressed by proposing IllusionPIN (IPIN), a PIN-based authentication method that operates on touchscreen devices. IPIN uses the technique of hybrid images to blend two keypads with different digit orderings in such a way, that the user who is close to the device is seeing one keypad to enter her PIN, while the attacker who is looking at the device from a bigger distance is seeing only the other keypad. The user's keypad is shuffled in every authentication attempt since the attacker may memorize the spatial arrangement of the pressed digits. To reason about the security of IllusionPIN, we developed an algorithm which is based on human visual perception and estimates the minimum distance from which an observer is unable to interpret the keypad of the user. We tested our estimations with 84 simulated shoulder-surfing attacks from 21 different people. None of the attacks was successful against our estimations. In addition, we estimated the minimum distance from which a camera is unable to capture the visual information from the keypad of the user. Based on our analysis, it seems practically almost impossible for a surveillance camera to capture the PIN of a smartphone user when IPIN is in use.