

**BUSITEMA UNIVERSITY**  
**FACULTY OF ENGINEERING**  
**DEPARTMENT OF COMPUTER ENGINEERING**

**SIGNATRURE RECOGNITION AND VERIFICATION SYSTEM**  
**A FINAL YEAR PROJECT REPORT**

**BY**

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## **DECLARATION**

**I Nakanyike Angella**, do hereby declare that this Project Report is original and has not been submitted for any other degree award to any other University before.

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## **APPROVAL**

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## List of Acronyms

DWT	Discrete Wavelet Transform
TA	True Acceptation
FR	False Rejection
TR	True Rejection
FA	False Acceptation
BPNN	Back propagation Neural Network
PDA	Personal Digital Assistants
ANN	Artificial Neural Networks
HMM	Hidden Markov Models
SVM	Support Vector Machine
OSV	Online Signature Verification
PCA	Principle Component Analysis
FAR	False Acceptance Rate
FRR	False Rejection Rate
SVGMC	Signature Verification using Graph Matching and Cross-Validation principle
EER	Equal Error Rate
ASV	Automated Signature Verification
RGB	Red, Green and Blue

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## **ABSTRACT**

Signature is a behavioral biometric, it is not based on the physical properties, such as fingerprint or face, of the individual, but behavioral ones. The reality is that signatures can be easily forged, resulting into costly outcomes, therefore signature verification system was needed to be developed. Signature verification is the process used to recognize an individual's handwritten signature. It involves two separate but strongly related tasks: one of them is identification of the signature owner, and the other is the decision about whether the signature is genuine or forged. A Static signature verification system using android mobile phone was developed where a signature is written offline such as bank cheque and the system reads the image scanned, and then verifies it with the signatures in database of the customer, It's mainly to be used in banking applications, government documents, signing of treaties between countries and student mark sheets. Such a system will remove the manual verification of signatures; two people verifying the same signature will have different opinions and will derive different conclusions about the authenticity of it. It is a more accurate method of verifying signatures of individuals.

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# CHAPTER ONE

## INTRODUCTION

### 1.0 Background

Every day, millions of transactions take place all around the world which uses signatures as a means of authentication, where every individual has a unique signature. The reality is that signatures can be easily forged, resulting into costly outcomes, and forgery mainly depends on the three different types: “**random forgeries**” which are produced without knowing either the name of the signer nor the shape of his signature; “**simple forgeries**” which are produced by those who know the name of the signer but do not have an example of a genuine signature; and “**skilled forgeries**” which are produced by those who have access to a genuine signature (or a copy) and attempt to imitate it as closely as possible[1].

For businesses reliant on signatures such as in banks, intelligence agencies and high-profile institutions to validate the identity of an individual, Signature Recognition and Verification System is faster, more cost-effective and accurate than human eyes which is essential in various banking operations such as cheque clearing, manual fund transfer, as automated banking transactions, electronic fund transfers, document analysis, and access control and among others instead of employing operators (human labour) to perform manual signature comparisons on all transactions daily, the system engine automatically performs this task, and human operators are only alerted when questionable cases call for human verification. This saves time and energy and helps to prevent human error during the signature process and lowers chances of forgeries in the process of authentication[2].

Signature Recognition and Verification System has now become lightweight, fast, flexible and more reliable with multiple options for storage in database. [3] It can automatically search for a signature within an image or file. Signature Recognition and Verification System is categorized into two types, Offline Signature Recognition and Verification System and Online Signature Verification System.

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