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A COMPARATIVE STUDY OF COUNTERMEASURES TO DETECT SPOOFING ATTACKS IN
FACE AUTHENTICATION SYSTEMS

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Universidade Estadual de Campinas
Faculdade de Engenharia Elétrica e de Computação

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A COMPARATIVE STUDY OF COUNTERMEASURES TO DETECT SPOOFING ATTACKS IN
FACE AUTHENTICATION SYSTEMS

Qualificação de Mestrado apresentada na Faculdade de Engenharia Elétrica e de Computação como parte dos requisitos exigidos para a obtenção do título de Mestre em Engenharia Elétrica. Área de concentração: Computação

Orientador: Professor Doutor José Mario De Martino

Este exemplar corresponde a versão final do exame de qualificação apresentado pelo aluno, e orientado pelo Prof. Dr. José Mario De Martino

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FAÇA AQUI SUA DEDICATÓRIA.

Acknowledgment

Text

A maravilhosa disposição e harmonia do universo só pode ter tido origem segundo o plano de um Ser que tudo sabe e tudo pode. Isto fica sendo a minha última e mais elevada descoberta.

Isaac Newton

Abstract

User authentication is an important step to protect information and in this field face biometrics is advantageous. Face biometrics is natural, easy to use and less human-invasive. Unfortunately, recent work has revealed that face biometrics is vulnerable to spoofing attacks using low-tech equipments. Countermeasures have been proposed in order to mitigate this vulnerabilities. However several works in the literature present evaluations using different metrics and in private database making the comparison of countermeasures a difficult task. The main goal of this masters project is to provide a comparative study of countermeasures against face *spoofing* attacks.

Key-words: Antispoofing, Liveness detection, Countermeasure, Face Recognition, Biometrics

List of Figures

List of Tables

Acronyms

Contents

1	Introduction	xxiii
1.1	Scope and Contributions	xxiii
1.2	Organization of the Thesis	xxiii
2	Biometrics	xxv
2.1	Introduction to Biometric Systems	xxv
2.2	Attacks in Biometric Systems	xxv
3	Spoofing Attacks	xxvii
3.1	Spoofing Attacks in Biometrics	xxvii
3.2	Spoofing Attacks in Face Recognition	xxvii
3.2.1	Presence of vitality (liveness)	xxvii
3.2.2	Difference in motion patterns	xxvii
3.2.3	Differences in image quality assessment	xxvii
3.3	Face Spoofing Databases	xxvii
4	Developed Countermeasures	xxix
5	The Comparative Study	xxxi
5.1	Databases Permeability	xxxi
5.2	Evaluation Protocol	xxxi
5.2.1	Intra Database Test Protocol	xxxi
5.2.2	Inter Database Test Protocol	xxxi
5.2.3	Evaluation Metrics	xxxi
6	Experiments and Results	xxxiii
7	Conclusion	xxxv
8	Future Work	xxxvii
A	Related Publications	xxxix

Chapter 1

Introduction

1.1 Scope and Contributions

1.2 Organization of the Thesis

Chapter 2

Biometrics

2.1 Introduction to Biometric Systems

2.2 Attacks in Biometric Systems

Spoofing Attacks

3.1 Spoofing Attacks in Biometrics

3.2 Spoofing Attacks in Face Recognition

3.2.1 Presence of vitality (liveness)

3.2.2 Difference in motion patterns

3.2.3 Differences in image quality assessment

3.3 Face Spoofing Databases

Chapter 4

Developed Countermeasures

The Comparative Study

5.1 Databases Permeability

5.2 Evaluation Protocol

5.2.1 Intra Database Test Protocol

5.2.2 Inter Database Test Protocol

5.2.3 Evaluation Metrics

Chapter 6

Experiments and Results

Chapter **7**

Conclusion

Chapter 8

Future Work

Appendix A

Related Publications

Bibliografia