

A Project Report

on

ANOMALY DEVICE FINGERPRINTING

Submitted for the partial fulfillment of the requirement

for the award of the Degree of

BACHELOR OF TECHNOLOGY

In

COMPUTER SCIENCE & ENGINEERING

by

RITAM GHOSH

Under the Supervision of

RAMANPREET KAUR

Under the Supervision of

SAKET ARUN JADHAV



DIT UNIVERSITY, DEHRADUN, INDIA

**(State Private University through State Legislature Act No 10 of 2013 of
Uttarakhand and approved by UGC)**

Mussoorie Diversion Road, Dehradun, Uttarakhand-248009, India

2019-2020



DECLARATION

This is to certify that the Project entitled “**Anomaly Device Fingerprinting**” in partial fulfillment of the requirement for the award of the **Degree of Bachelor of Technology in Computer Science & Engineering**, submitted to **DIT University, Dehradun, Uttarakhand, India**, is an authentic record of my own work carried out during the period January 2020 to May 2020, under the supervision of **Mr. Saket Arun Jadhav**.

The matter embodied in this Project has not been submitted for the award of any other degree or diploma to any University/Institution.

Ritam Ghosh

160111046

Date: 12/04/2020

Place: Dehradun



CERTIFICATE

This is to certify that the Project entitled “**Anomaly Device Fingerprinting**” in partial fulfillment of the requirement for the award of the **Degree of Bachelor of Technology** in **Computer Science & Engineering**, submitted to **DIT University, Dehradun, Uttarakhand, India**, is an authentic record of bonafide research work carried out by **Mr. Ritam Ghosh, 160111046** under my supervision.

Ramanpreet Kaur
IBM Trainer
DIT University

Saket Arun Jadhav
Product Engineer
Vehere Interactive

Dr. Vishal Bharti
HOD of Department
Dept. CSE

Date: 12/04/2020

Place: Dehradun

ABBREVIATIONS

CNN	CONVOLUTIONAL NEURAL NETWORK ^[3]
RNN	RECURRENT NEURAL NETWORKS ^[3]
RELU	RECTIFIED LINEAR UNIT ^[2]

ACKNOWLEDGEMENT

I gratefully acknowledge **Mr. Prasenjit Mandal (Senior Product Engineer), Vehere Interactive, Kolkata** for his permission, expertise, appreciation and recognition during the work.

I express my sincere thanks to my mentor during internship program **Mr. Saket Arun Jadhav (Product Engineer), Vehere Interactive, Kolkata**, for his personal attention, guidance and encouragement during this work.

I heartily thank our university mentor **Mrs. Ramanpreet Kaur (IBM Trainer), DIT University, Dehradun** for his guidance and suggestions during this completion project work.

The joy of getting acquainted with a group of well associated, highly efficient, professional staff was a great experience to me. I acknowledge, at this moment, the appreciations, recognitions, favours, advices and encouragement from all members of Vehere Interactive, Kolkata & DIT University, Dehradun has given to me, which has thrown new light and meaning on my life.

I once again sincerely thanks all those who have helped me directly and indirectly during my project.

Ritam Ghosh

ABSTRACT

This project automates the various manual procedures that occur during device fingerprinting which is commonly used for tracking, monitoring & detection. In this device fingerprinting is used but in the specific context of anomaly, providing signatures & pattern analysis of incoming & outgoing processes of a network of an organisation to maintain security standards. Device Fingerprinting is a new way of differentiating between a valuable client, employee and professional fraudster online. Online identity verification and authentication is a significant challenge and concern to all business owners to safeguards their organisation interest.

So, the topic “Anomaly Device Fingerprinting” is chosen to develop an automated system which can validates internal security from inside and outside world. It will not only act as a self-propelled firewall from an organisation but as a monitoring, tracking and detection system for an organisation having full control of it. This automated system will reduce the risk as having own monitoring system than trusting other 3rd party firewall. Here an automated programmed & algorithm will be developed as per datasets generated after pre-processing & transformation of raw data which will help in having an automated device fingerprinting system for network analysis.

LIST OF FIGURES

Figure No.	Title	Page No
Fig 1	Methodology Stages	12
Fig 2	Activity Diagram	13
Fig 3	Flow Diagram.....	14
Fig 4	Flow Diagram.....	14
Fig 5	layers structure	15
Fig 6	CNN Architecture	15
Fig 7	Model Flow	16
Fig 8	Anomaly Detection Architecture.....	16
Img 1	Raw Data	17
Img 2	Featured Data Frame	18
Img 3	Min Max Data Frame.....	19
Img 4	Model Accuracy	20
Img 5	Packet Data	20

TABLE OF CONTENTS

Title	Page No.
DECLARATION.....	II
CERTIFICATE.....	III
ABBREVATIONS.....	IV
ACKNOWLEDGEMENT.....	V
ABSTRACT.....	VI
LIST OF FIGURES.....	VII
TABLE OF CONTENTS.....	VIII

CHAPTER 1 INTRODUCTION

1.1 ABOUT VEHERE	01
1.2 VEHERE PRODUCT DOMAINS.....	02
1.3 PURPOSE	03
1.4 OBJECTIVE	03
1.5 MOTIVATION	03
1.6 DEFINITION AND OVERVIEW.....	04
1.7 COMBAT STRATEGY.....	05

CHAPTER 2 OVERALL DESCRIPTION

2.1	METHODOLOGY.....	08
2.2	PROJECT PERSPECTIVE.....	09
2.3	PROJECT PARAMETERS	10
2.4	PROJECT FUNCTIONALITY	11

CHAPTER 3 FIGURES & DIAGRAMS

CHAPTER 4 INTERFACES

4.1	DEVELOPER USER INTERFACES.....	17
4.2	HARDWARE INTERFACES.....	21
4.3	SOFTWARE INTERFACES.....	22

CHAPTER 5 CONCLUSION AND SCOPE OF WORK

5.1	CONCLUSION.....	23
5.2	SCOPE OF WORK.....	24
5.3	REFERENCES	25