

INTRUSION DETECTION FRAMEWORK

*A major project report submitted in partial fulfillment of the requirements
for the award of degree of*

**BACHELOR OF ENGINEERING
IN
COMPUTER SCIENCE & ENGINEERING**

**SUBMITTED BY
Aadhaar Koul Cse - A1 (2020a1r040)**

**UNDER THE SUPERVISION OF
Mr. Saurabh Sharma
Assistant Professor, CSE**



AUTONOMOUS

SUBMITTED TO

**Department of Computer Science & Engineering
Model Institute of Engineering and Technology (Autonomous)
Jammu, India**

CANDIDATES DECLARATION

I hereby declare that the work which is being presented in the major project report entitled, **“INTRUSION DETECTION FRAMEWORK”** in the partial fulfillment of requirement for the award of degree of B.E. (CSE) and submitted to the Department of Computer Science and Engineering, Model Institute of Engineering and Technology (Autonomous), Jammu, is an authentic record of our own work carried by us under the supervision of Mr. Saurabh Sharma , Asst. Prof. CSE Dept.. The matter presented in this report has not been submitted to any other University/Institute for the award of Bachelor of Engineering.

Signature of the Student

Dated: 30-05-2024

Aadhaar Koul Cse - A1 (2020a1r040)

Department of Computer Science & Engineering
Model Institute of Engineering and Technology (Autonomous)
Kot Bhalwal, Jammu, India
(NAAC “A” Grade Accredited)

Ref. No.: MIET/CSE/2024/P10

Date:30/05/2024

CERTIFICATE

Certified that this major project report entitled “**INTRUSION DETECTION FRAMEWORK**” is the bonafide work of “**Aadhaar Koul (2020a1r040), Computer Science Engineering, Model Institute of Engineering and Technology (Autonomous), Jammu**”, who carried out the major project work under my/our supervision during February 2024 - June 2024.

Mr. Saurabh Sharma
Asst. Professor, CSE

This is to certify that the above statement is correct to the best of my knowledge.

Mr. Navin Mani Upadhyay
Head CSE Department
Model Institute of Engineering & Technology (Autonomous)

ACKNOWLEDGEMENTS

This Major Project opportunity was a great chance for learning and professional development. I would also like to express my deepest gratitude to **Mr. Saurabh Sharma**, Asst. Prof., CSE, for his precious guidance and knowledge which were extremely valuable for our study both theoretically and practically.

I must record my deep sense of gratitude to **Prof. (Dr.) Ankur Gupta (Director, MIET)**, **Prof. (Dr.) Ashok Kumar (Dean Academics, MIET)**, and **Prof. Devanand Padha** for their guidance, constant inspiration, encouragement, and for their keen involvement throughout the course of present work.

Gratitude and thanks although mean a very small thing to convey my thanks to my parents who have always given me a parental source of love, motivation and strength right from the journey of my life.

Bearing in mind previous I am using this opportunity to express my deepest gratitude and special thanks to the faculty members who in spite of being extraordinarily busy with their duties, took time out to hear, guide and keep me on the correct path and allowing me to carry out my project at their esteemed organization and extending during the training.

We perceive this opportunity as a big milestone in our career development. We will strive to use gained skills and knowledge in the best possible way, and We will continue to work on their improvement, in order to attain desired career objectives. Hope to continue cooperation with all of you in the future.

Aadhaar Koul Cse - A1 (2020a1r040)

CONTENTS

	Page No.
ABOUT	
PREFACE	3
Acknowledgement	4
Abstract	6
Motivation	7
Background and Context	8
Problem Statement and Justification	8
Solution	12
Introduction	13
CHAPTER 1	
Theory	25
1.1 Technical Stack	25
1.2 Languages	25
1.3 Computer Vision Module	26
1.4 Surveillance Module	30
1.4.1 .1Fig : EP-32 Cam	30
1.4.2 Features	31
1.4.3 Circuit	31
1.4.4 Video Streaming Server	31
1.4.5 Install the ESP32 add-on	31
1.4.6 Code	32
CHAPTER 2	
IOT Module	36
2.1 Ultra sonic sensor	40
2.2 Humidity and temperature sensor	40
2.3 Esp8266	40
CHAPTER 3	
Blynk Cloud Module	46
3.1 Components of the Blynk IoT Platform	46
3.2 How Data Flows From Device to Blynk	47
3.3 Send Data With Blynk Library Firmware API	47
CHAPTER 4	
Network Gateway Module	49
CHAPTER 5	
Honeypot Module	54
CHAPTER 6	
Features of ESP8266	54
CHAPTER 7	
Flashing code to ESP8266	55

	7.1 Installing ESP8266 Board in Arduino IDE	55
	7.2 Flashing Steps	57
	7.3 Developing the Honeypot Script	58
CHAPTER 8	One Stop Solution Framework	63
	8.1 Admin Control Application	65
	8.2 Implementation	69
	8.3 Libraries Used	69
	8.4 Use	69
	8.5 Module Code snippets	72
	8.6 Login Page	72
	8.7 Code	72
	8.8 Dashboard Page	73
	8.9 Code	73
CHAPTER 9	Proposed Framework	78
	9.1 Initialization	80
	9.2 Activity Detection	81
	9.3 Intrusion Detection	81
	9.4 Honeypot Trigger	81
	9.5 Admin's Actions	81
	9.6 Final State - Keep True	81
CHAPTER 9	Estimations and Expectations	82
	9.1 Results	83
	9.2 Future Scope	84
	REFERENCES	85
	APPENDIX	86

LIST OF FIGURES

Fig No.	Figure	Page No.
Figure1	Data Breach Statistics	9
Figure2	Data Breach Statistics 2	10
Figure3	Global cyber Study	11
Figure 4	Firewall	13
Figure 5	IOT Enablers	22
Figure 6	YOLO Python Implementation	29
Figure 7	YOLO Working	29
Figure 8	ESP32 CAM Circuit	31
Figure 9	ESP CAM Code Implementation	32
Figure 10	Surveillance Module Working	34
Figure 11	Blynk Cloud Dashboard	46
Figure 12	Network Dashboard	53
Figure 13	Honeypot Script	59
Figure 14	Honeypot Dashboard	62
Figure 15	OSS Code Implementation	63
Figure 16	OSS Working	64
Figure 17	Android App Dashboard	68
Figure 18	Android App Java Code	72
Figure 19	Proposed Framework	78
Figure 20	Proposed Workflow	80

Preface

In this document, we explore a comprehensive approach to developing a sophisticated Intrusion Detection Framework (IDF). The journey begins with the motivation and context that led to this project and traverses through the technical aspects, including computer vision, surveillance modules, IoT integration, and network security frameworks. Each section is meticulously crafted to provide clear insights and practical solutions for implementing a robust surveillance system. Our goal is to bridge theoretical knowledge with practical applications, thereby providing a valuable resource for professionals and enthusiasts in the field