FRAUD DETECTION IN AUTO INSURANCE CLAIMS USING MACHINE LEARNING ALGORITHMS AND DATA VISIUALIZATION USING POWER BI

AN INTERNSHIP REPORT

Submitted by,

Name: Hamsa Girish

Roll Number: 20211CSE0264

Under the guidance of,

Prof. Kalpana K

Assistant Professor, School of Computer Science and Engineering,

Presidency University, Bengaluru.

in partial fulfilment for the award of the degree of

BACHELOR OF TECHNOLOGY

IN

COMPUTER SCIENCE AND ENGINEERING

At

PRESIDENCY UNIVERSITY

BENGALURU

MAY 2025

PRESIDENCY UNIVERSITY

SCHOOL OF COMPUTER SCIENCE ENGINEERING

CERTIFICATE

This is to certify that "FRAUD DETECTION IN AUTO INSURANCE CLAIMS USING MACHINE LEARNING ALGORITHMS AND DATA VISUALIZATION USING POWER BI" being submitted by "HAMSA GIRISH" bearing roll number "20211CSE0264" in partial fulfillment of the requirement for the award of the degree of Bachelor of Technology in Computer Science and Engineering, is a bonafide work carried out under my supervision.

Prof. Kalpana K
Assistant Professor,
PSCS
Presidency University

Dr. Asif Mohammed H B
Associate Professor and HoD
PSCS
Presidency University

Dr. MYDHILI NAIR
Associate Dean
PSCS
Presidency University

Dr. SAMEERUDDIN KHAN
Pro-Vice Chancellor - Engineering
Dean – PSCS / PSIS
Presidency University

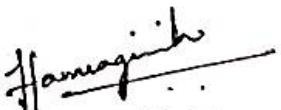
PRESIDENCY UNIVERSITY

SCHOOL OF COMPUTER SCIENCE ENGINEERING

DECLARATION

I hereby declare that the work, which is being presented in the report entitled **"FRAUD DETECTION IN AUTO INSURANCE CLAIMS USING MACHINE LEARNING ALGORITHMS AND DATA VISUALIZATION USING POWER BI"** in partial fulfillment for the award of Degree of **Bachelor of Technology in Computer Science and Engineering**, is a record of my own investigations carried under the guidance of **Prof. Kalpana K, School of Computer Science Engineering, Presidency University, Bengaluru.**

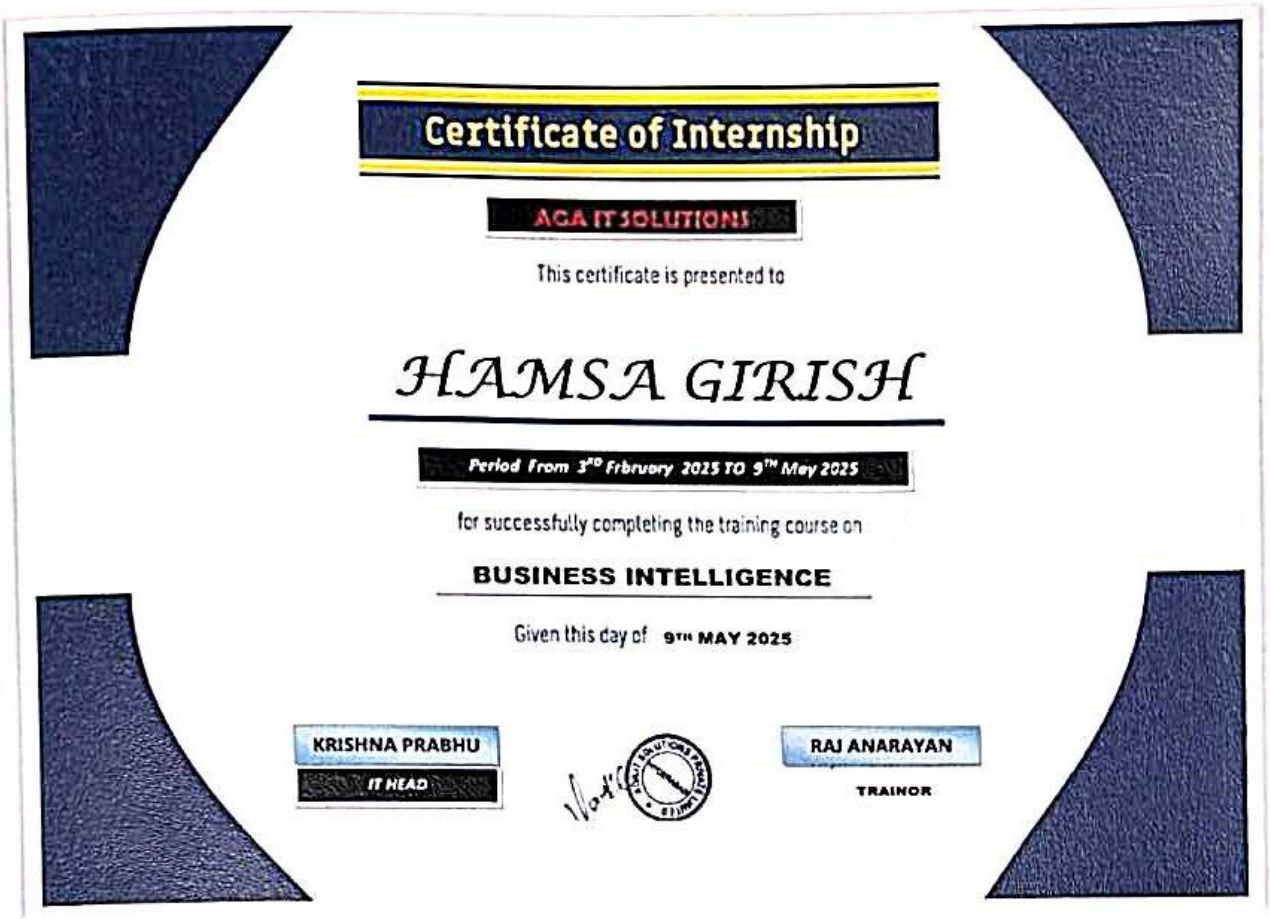
I have not submitted the matter presented in this report anywhere for the award of any other Degree.



Hamsa Girish

20211CSE0264

INTERNSHIP COMPLETION CERTIFICATE



Certificate of Internship

AGA IT SOLUTIONS

This certificate is presented to

HAMSA GIRISH

Period From 3RD February 2025 TO 9TH May 2025

for successfully completing the training course on

BUSINESS INTELLIGENCE

Given this day of 9TH MAY 2025

KRISHNA PRABHU

IT HEAD

RAJ ANARAYAN

TRAINOR

AGA IT SOLUTIONS PRIVATE LIMITED

Date: 9th May 2025

INTERNSHIP COMPLETION LETTER

To,
Hamsa Girish,,
Nagasandra, VTC.Bangalore North,
Bangalore,Karnataka , -560073.

Greetings, Mrs. Hamsa Girish

Congratulations on completing your internship with AGA IT SOLUTIONS, your dedication and hard work have been commendable. Throughout your internship, you consistently demonstrated exceptional skills. Professionalism and a strong work ethic. Your contributions to our organization have been invaluable.

We appreciate your efforts in successfully completing assigned projects and tasks. Your attentions to detail, ability to meet deadlines, and high-quality work have been impressive. Thank you for your positive attitude and collaboration with the team. Your ability to work well with others and contribute to our success has been greatly appreciated.

We are confident that you have a bright future ahead. On behalf of Aga It Solutions, we wish you every success in your future endeavors. Please feel free to reach out if you need any further assistance or If you require any documentation from our organization.

Yours sincerely,

AGA IT SOLUTIONS PRIVATE LIMITED

Authorized Signature

AGA IT SOLUTIONS PRIVATE LIMITED HYDERABAD

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ACKNOWLEDGEMENT

First of all, I indebted to the **GOD ALMIGHTY** for giving me an opportunity to excel in our efforts to complete this project on time.

We express our sincere thanks to our respected dean **Dr. Md. Sameeruddin Khan,** Pro-VC - Engineering and Dean, Presidency School of Computer Science and Engineering & Presidency School of Information Science, Presidency University for getting us permission to undergo the project.

We express our heartfelt gratitude to our beloved Associate Dean **Dr. Mydhili Nair,** Presidency School of Computer Science and Engineering, Presidency University, and **Dr. Asif Mohammed H B,** Head of the Department, Presidency School of Computer Science and Engineering, Presidency University, for rendering timely help in completing this project successfully.

We are greatly indebted to our guide and reviewer **Prof. Kalpana K**, Presidency School of Computer Science and Engineering, Presidency University for her inspirational guidance, and valuable suggestions and for providing us a chance to express our technical capabilities in every respect for the completion of the internship work.

We would like to convey our gratitude and heartfelt thanks to the CSE7301 Internship/University Project Coordinators, **Mr. Md Ziaur Rahman and Dr. Sampath A K**, department Project Coordinators, **Prof. Kalpana K** and Git hub coordinator **Mr. Muthuraj**.

We thank our family and friends for the strong support and inspiration they have provided us in bringing out this project.

Hamsa Girish
(20211CSE0264)

ABSTRACT

During my internship, I had the opportunity to work on a highly relevant and impactful project focused on detecting fraud in vehicle insurance claims using machine learning and data visualization tools. One of the major challenges in the insurance industry is the growing number of false claims, which leads to significant financial losses and increased premiums for genuine customers. Traditionally, detecting fraudulent claims has relied heavily on manual processes, which are time-consuming, labor-intensive, and often inaccurate. To address this issue, our project explored the use of various machine learning algorithms—including AdaBoost, XGBoost, Naïve Bayes, Support Vector Machines, Logistic Regression, Decision Trees, Artificial Neural Networks, and Random Forests—to automatically identify potentially fraudulent claims. Among these, XGBoost stood out for its superior accuracy and recall in classifying fraud cases.

In addition to predictive modeling, I developed interactive dashboards in Power BI to visualize real-time fraud patterns. These dashboards present key insights such as fraud distribution by state, incident type, policy details, and claim amounts. This visual approach not only enhances understanding but also supports insurance analysts and investigators in making quick, data-driven decisions to prevent and manage fraud more effectively. Overall, this project deepened my knowledge of machine learning applications in the insurance domain, improved my data visualization skills, and provided me with valuable experience in solving real-world business problems. The outcomes of this study can significantly contribute to building more efficient, automated fraud detection systems for insurance companies.