HYBRID CREDIT CARD FRAUD DETECTION USING ANOMALY DETECTION AND GENETIC ALGORITHM

BY

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CERTIFICATION

This is to certify that this dissertation entitled **Hybrid Credit Card Fraud Detection using Anomaly Detection and Genetic Algorithm** was carried out by Fawehinmi Olumide Abimbola with matriculation number 13PCG00518 under our supervision and approved by us:

Professor Nicholas A.I. Omoregbe

Supervisor *Signature and Date*

Professor Victor Osamor.

Head of Department *Signature and Date*

External **Examiner**

Signature and Date

DEDICATION

I dedicate this dissertation to the Almighty God, the Author and Finisher of my faith, to my entire family, most especially my beloved wife, Barr.(Mrs.) Fawehinmi Ifedayo Oluwakemi, I will forever be grateful.

DECLARATION

I hereby declare that this dissertation titled **Hybrid Credit Card Fraud Detection using Anomaly Detection and Genetic Algorithm** was carried out by Fawehinmi Olumide Abimbola with matriculation number 13PCG00518. The project is centred on an original study in the Department of Computer and Information Sciences, College of Science and Technology, Covenant University, Ota, under the supervision of Professor. Nicholas A.I Omoregbe. Concepts of this research project are results of the research carried out by Fawehinmi Olumide Abimbola and ideas of other researchers have been fully recognised.

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ABSTRACT

The introduction of electronic (e-payment) technologies via credit card has significantly developed banking and other financial sector. This development has brought about reduction in the size of long queues and also the time mostly taken by customers in making and payment transaction. In spite of the growing trend of e-payment, the financial transaction has been marred with fraud This dissertation presents a machine learning based Hybrid Credit Card Fraud (HCCFD) model which uses anomy detection technique by applying multivariate normal distribution and genetic algorithm to detect fraudulent transaction on a credit card. HCCFD was trained using an imbalance dataset of credit

card transaction with thirty thousand (30,000) observations each having 19 features and a target variable which indicate if a transaction is fraudulent or not. The dataset were preprocessed by normalizing it and then was subdivided into three (3) in the orders of 70% for training set, 15% for validation set and 15% testing set. The training set was used to compute Mean Vector and covariate matrix of the dataset while validation set was used by genetic algorithm to set the threshold between fraudulent and non-fraudulent transactions. The test set was used to evaluate the performance of HCCFD and it was found that HCCFD significantly outperformed its counterparts (Support Vector Machine (SVM), Decision Tree and Artificial Neural Network (ANN)) trained on the same training set in terms of prediction accuracy and prediction time.