ACADEMIC YEAR (2022-2023)							
		J.K.K.MUNIRAJAH COLLEGE OF TECHNOLOGY T.N.Palayam(po),Gobi(tk)-638506, Erode(dt).					Metric No 1.3.2
S.No	Name of the course	course code	programme offering	Experiential learning			Number of students
				project work	field work	inplant training	
(2022-2023) Regulation-2021							
1	Advanced Data Structures and Algorithms	CP4151	MASTER OF COMPUTER SCIENCE AND ENGINEERING	✓			4
2	Database Practices	CP4152	MASTER OF COMPUTER SCIENCE AND ENGINEERING	✓			6
3	Network Technologies	CP4153	MASTER OF COMPUTER SCIENCE AND ENGINEERING	✓			5
4	Internet of Things	CP4291	MASTER OF COMPUTER SCIENCE AND ENGINEERING	✓			5
5	Machine Learning	CP4252	MASTER OF COMPUTER SCIENCE AND ENGINEERING	✓			6
6	Advanced Software Engineering	SE4151	MASTER OF COMPUTER SCIENCE AND ENGINEERING	✓			5
7	Security Practices	CP4391	MASTER OF COMPUTER SCIENCE AND ENGINEERING	✓			4
8	Project Work I	CP4311	MASTER OF COMPUTER SCIENCE AND ENGINEERING	✓			9
9	Project Work II	CP4411	MASTER OF COMPUTER SCIENCE AND ENGINEERING	✓			9
10	Cloud Computing Technologies	MP4251	MASTER OF COMPUTER SCIENCE AND ENGINEERING	✓			6

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T.N. Palayam (Po), Gobi (Tk), Erode (Dt) – 638 506

MASTER OF COMPUTER SCIENCE AND ENGINEERING

2022-2023

S.NO	REG.NO	STUDENT NAME	PROJECT	INTERNSHIP	FIELD VISIT
1	731221405001	ARUNKUMAR R	✓	✓	
2	731221405002	CHARLY S	✓	✓	
3	731221405005	GAYATHRI S	✓	✓	
4	731221405006	INDHIRAN R	✓	✓	
5	731221405007	LOGARAJA S		✓	
6	731221405008	NAVEEN S	✓	✓	
7	731221405009	PONMANI A	✓	✓	
8	731221405010	RAJESH KUMAR A	✓	✓	
9	731221405011	RANJANI R	✓	✓	
10	731221405014	SURESHKUMAR P	✓	✓	
11	731222405001	KIRUTHIKA S		✓	
12	731222405002	THAMARAISELVI R		✓	

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MASTER OF COMPUTER SCIENCE AND ENGINEERING

S.No	Name of the Course that include experiential learning through Project Work/Internship/Field Visit
1	Advanced Data Structures and Algorithms
2	Database Practices
3	Network Technologies
4	Internet of Things
5	Machine Learning
6	Advanced Software Engineering
7	Security Practices
8	Project Work I
9	Project Work II
10	Cloud Computing Technologies

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PROJECT

CP4152 **DATABASE PRACTICES** L TPC 3024

COURSEOBJECTIVES

- Describethefundamentalelementsofrelationaldatabasemanagementsystems
- Explainthebasicconceptsofrelationaldatamodel,entity-relationshipmodel,relational database design, relational algebra and SQL.
- Understand query processing in a distributed database system
- Understand the basics of XML and create well-formed and valid XML documents.
- Distinguish the different types of NoSQL databases
- To understand the different models involved in database security and their applications in real time world to protect the database and information associated with them.

UNITI RELATIONALDATAMODEL 15

EntityRelationshipModel–RelationalDataModel–MappingEntityRelationshipModelto Relational Model – Relational Algebra – Structured Query Language – Database Normalization.

SuggestedActivities:

DataDefinitionLanguage

- Create,AlterandDrop
- EnforcePrimaryKey,ForeignKey,Check,UniqueandNotNullConstraints
- CreatingViews

DataManipulationLanguage

- Insert,Delete,Update
- CartesianProduct,EquiJoin,LeftOuterJoin,RightOuterJoinandFullOuterJoin
- Aggregate Functions
- SetOperations
- Nested Queries

TransactionControlLanguage

- Commit,RollbackandSavePoints

UNIT II DISTRIBUTEDDATABASES,ACTIVE DATABASES AND OPENDATABASE CONNECTIVITY 15

Distributed Database Architecture—Distributed Data Storage—Distributed Transactions—Distributed Query Processing – Distributed Transaction Management – Event Condition Action Model – Design and Implementation Issues for Active Databases – Open Database Connectivity.

Suggested Activities:

- Distributed Database Design and Implementation
- Row Level and Statement Level Triggers
- Accessing a Relational Database using PHP,PythonandR

UNITIII XMLDATABASES 15

Structured,Semistructured, and Unstructured Data—XML Hierarchical Data Model—XML Documents—DocumentTypeDefinition—XMLSchema—XMLDocumentsandDatabases—XMLQuerying—XPath—XQuery

SuggestedActivities:

- Creating XML Documents,Document Type Definition and XMLSchema
- Using a Relational Database to store the XML documents as text
- Using a Relational Database to storetheXMLdocumentsasdataelements
- CreatingorpublishingcustomizedXMLdocumentsfrompre-existingrelationaldatabases
- ExtractingXMLDocumentsfromRelationalDatabases
- XMLQuerying

UNITIV NOSQLDATABASESANDBIGDATASTORAGESYSTEMS **15**

NoSQL–CategoriesofNoSQLSystems–CAPTheorem–Document-BasedNoSQLSystems and MongoDB – MongoDB Data Model – MongoDB Distributed Systems Characteristics – NoSQL Key-Value Stores – DynamoDB Overview – Voldemort Key-Value Distributed Data Store – Wide ColumnNoSQLSystems–HbaseDataModel–HbaseCrudOperations–HbaseStorageand Distributed System Concepts –NoSQL Graph Databases and Neo4j – Cypher Query Language of Neo4j–BigData–MapReduce–Hadoop–YARN.

SuggestedActivities:

- CreatingDatabasesusingMongoDB,DynamoDB,VoldemortKey-ValueDistributedData Store Hbase and Neo4j.Writingsimplequeriestoaccessdatabasescreatedusing MongoDB,DynamoDB,Voldemort Key-Value Distributed Data Store Hbase and Neo4j.

UNITV DATABASESECURITY **15**

DatabaseSecurityIssues—DiscretionaryAccessControlBasedonGrantingandRevoking Privileges –Mandatory Access Control and Role-Based Access Control for Multilevel Security – SQL Injection—Statistical Database Security—Flow Control—Encryption and Public Key Infrastructures—Preserving Data Privacy—Challenges to Maintaining Database Security—Database Survivability – Oracle Label-Based Security.

SuggestedActivities:

ImplementingAccessControlinRelationalDatabases

TOTAL:75 PERIODS

COURSEOUTCOMES

At theendofthecourse,thestudentswillbe ableto

CO1: Convert the ER-model to relational tables, populate relational databases and formulate SQL queries on data.

CO2: Understandandwritewell-formedXMLdocuments

CO3: Beabletoapplymethodsandtechniquesfordistributedqueryprocessing.

CO4: DesignandImplementsecuredatabasesystems.

CO5: Usethedatacontrol,definition,andmanipulationlanguagesoftheNoSQLdatabases

REFERENCES:

1. R. Elmasri, S.B. Navathe, "Fundamentals of Database Systems", Seventh Edition, Pearson Education 2016.
2. HenryF.Korth,AbrahamSilberschatz,S.Sudharshan,"DatabaseSystemConcepts", Seventh Edition, McGraw Hill, 2019.
3. C.J.Date,A.Kannan,S.Swamynathan,"AnIntroductiontoDatabaseSystems,Eighth Edition.

Pearson Education, 2006
4. RaghuRamakrishnan , JohannesGehrke "DatabaseManagementSystems",Fourth Edition, McGraw Hill Education, 2015.
5. Harrison, Guy, "Next Generation Databases, NoSQL and Big Data" , First Edition, Apresspublishers, 2015
6. Thomas Cannolly and Carolyn Begg, "Database Systems, A Practical Approach to Design, Implementation and Management", Sixth Edition, Pearson Education, 2015

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EDUCATION DATA TAKING OUT TO CARRY PROGRAM LEARNING VIA ANALYTIC DATA

A PROJECT REPORT (PHASE-II)

Submitted by

ARUNKUMAR R

731221405001

in partial fulfilment for the award of the degree of

MASTER OF ENGINEERING

in

COMPUTER SCIENCE AND ENGINEERING

JKK MUNIRAJAH COLLEGE OF TECHNOIOGY

T.N.PALAYAM, GOBI-638 506.

ANNA UNIVERSITY: CHENNAI 600 025

OCTOBER 2023

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GOBI (Tk), ERODE (Dt).

ANNA UNIVERSITY,CHENNAI

BONAFIDE CERTIFICATE

Certified that this Report titled "**EDUCATION DATA TAKING OUT TO CARRY PROGRAM LEARNING VIA ANALYTIC DATA**" is the bonafide work of "**ARUNKUMAR R (731221405001)**" who carried out the project work under my supervision. Certified further that to the best of my knowledge the work reported herein does not form part of any other thesis or dissertation on the basis of which a degree or award was conferred on an earlier occasion on this or any other candidate.

SIGNATURE

HEAD OF THE DEPARTMENT

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T.N.Palayam

SIGNATURE

SUPERVISOR

Dr. N.SATHYABALAJI M.E., Ph.D.,
Associate Professor ,

Dept.of. Computer Science and Engineering

JKK Munirajah College of Technology

T.N.Palayam

Submitted for the project viva Examination held on 09.10.2023 (FN)

9/10/23

INTERNAL EXAMINAR

9/10/23

EXTERNAL EXAMINAR

PRINCIPAL
JKK MUNIRAJAH COLLEGE
OF TECHNOLOGY
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ABSTRACT

The framework includes the following sequence data collection. log and score collection, and preprocessing clustering algorithms for problem-solving. for clustering data in Euclidean space, extracting statistical features from each cluster. and applying A frequent pattern growth algorithm for each cluster to determine data patterns and association rules. A set of recommendations based on extracted features, data patterns and rules. Tune other parameters to get the best results for the clustering and association rule mining algorithms.

At this time, in addition to classroom learning, the system also enhances programming learning and hands-on opportunities unsupervised algorithms.

The classification generates a large archive of analytical data result codes, logs, and score that can be valuable raw material for research in programming learning. We propose an educational data mining structure that supports programming learning using

Algorithms and data structures are used in programming courses to approximate the data that students use to solve real-world problems. We also experimentally use synthetic data to demonstrate the performance of our algorithm. Investigational results demonstrate that the proposed framework successfully extracts useful features, patterns, and rules from analytical data. Additionally, these extracted features, patterns, and rules highlight weaknesses and areas for improvement in programming learning.

Computer programming is of broad interest in the development of information and communication technologies in real life. Meet the growing demand for highly skilled programmers in critical challenges.

CHAPTER 1

INTRODUCTION

Today's information and communication technology (ICT) industry demands for highly skilled programmers for further development. The conventional computer programming learning environment is insufficient to prepare highly skilled programmers due to the limited number of exercise classes, limited practice opportunities, and lack of individual tutoring. In addition, most educational institutions, such as schools, colleges, and universities are struggling to build more educational facilities to increase academic activity (e.g., additional exercise classes, practice, and individual tutoring) due to logistical and organizational constraints. The growing number of people in classrooms in educational institutions, the large number of students per class, and some lectures are conducted with more than a thousand participants in the massive open online courses which complicate the individual tutoring process.

The growing ratio between students and educators raises the question of how to provide individual support to students to improve their problem-solving skills. Especially, when learning computer programming, students need a lot of practice and individual tutoring to improve their programming knowledge and skills. Computer programming is one of the fundamental courses in ICT discipline. Programming practice and competition can play an important role in acquiring good programming skills.

Educational data is evolving and the diversity of these data varies from one e-learning platform to another. Efficiently handling this massive and diverse educational data is a nontrivial and challenging task. Educational data mining (EDM) technique has emerged to address this problem. Due to the diversity, volume, nature, and structure of educational data, conventional data mining algorithms cannot be applied directly. Also, the data preprocessing is one of the most important tasks in the EDM process to achieve better results.

CHAPTER 8
CONCLUSION AND FUTURE SCOPE

8.1 Conclusion And Future Scope

Proposed an EDM framework for data clustering, patterns, and rules mining using real-world problem solving data. A mathematical model for data preprocessing, MK-means, and FP-growth algorithms were used to conduct this study. For programming education, OJ systems have been adopted by many institutions as academic tools. As a result, a huge number of programming-related resources (source codes, logs, scores, activities, etc.) are regularly accumulated in OJ systems. A large amount of real-world problem-solving data collected from the AOJ system was used in the experiments. Problem-solving data preprocessing is one of the main tasks to achieve accurate EDM results. Therefore, a mathematical model for problem-solving data preprocessing is developed. Then, the processed data are clustered using Elbow and MK-means algorithms. Various statistical features, data patterns and rules are extracted from each cluster based on different threshold values (K, min Conf , min Sup).

In the future, the experimental results of EDM using problem-solving data can be integrated to visualize different LA for programming platforms such as the OJ system. In addition, fuzzy estimation and polynomial approximation methods can be handy to dynamically select the optimal min Sup values based on the dataset. Appropriate min Sup values could help to generate the actual number of frequent elements and association rules from the dataset.

APPENDIX-3

Publication Proof

Certificate of Publication

This is to certify that

R. ARUNKUMAR Dr. N.SATHYABALAJI

Published following article

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Publication Head

IJEMH

International Journal of Engineering, Management and Humanities

CP4291 **INTERNET OF THINGS** **LTPC 3024**

COURSEOBJECTIVES:

- ToUnderstandtheArchitecturalOverviewofIoT
- ToUnderstandtheIoTReferenceArchitectureandRealWorldDesignConstraints
- ToUnderstandthevariousIoT levels
- Tounderstandthebasicsofcloud architecture
- TogainexperienceinRaspberryPIandexperimentsimpleIoTapplicationonit

UNITI INTRODUCTION **9+6**

Internet of Things- Domain Specific IoTs - IoT and M2M-Sensors for IoT Applications–Structure of IoT–IoTMapDevice-IoTSystemManagementwithNETCONF-YANG

UNITII IoTARCHITECTURE,GENERATIONSANDPROTOCOLS **9+6**

IETF architecture for IoT - IoT reference architecture -First Generation— Description&Characteristics–Advanced Generation – Description & Characteristics–Integrated IoT Sensors – Description & Characteristics

UNITIII IoTPROTOCOLSAND TECHNOLOGY **9+6**

SCADAandRFIDProtocols-BACnetProtocol-ZigbeeArchitecture-6LowPAN-CoAP-Wireless Sensor Structure–Energy Storage Module–Power Management Module–RF Module–Sensing Module

UNITIV CLOUDARCHITECTUREBASICS **9+6**

TheCloudtypes;IaaS,PaaS,SaaS.-Developmentenvironmentsforservicedevelopment; Amazon, Azure,GoogleAppcloudplatformindustry

UNITV IOTPROJECTSONRASPBERRYPI **9+6**

Building IOT with RASPBERRY PI- Creating the sensor project - Preparing Raspberry Pi - Clayster libraries—Hardware Interacting withthe hardware -Interfacing the hardware-Internalrepresentation of sensor values - Persisting data - Externalrepresentation of sensor values - Exporting sensor data

SUGGESTEDACTIVITIES:

1. DevelopanapplicationforLEDBlink andPatternusingArduinoorRaspberry Pi
2. DevelopanapplicationforLEDPatternwithPushButtonControlusingArduino or Raspberry Pi
3. DevelopanapplicationforLM35TemperatureSensor todisplaytemperaturevaluesusing arduino or Raspberry Pi
4. DevelopanapplicationforForestfiredetectionendnodeusingRaspberryPidevice and sensor
5. Developanapplicationforhomeintrusiondetectionwebapplication
6. DevelopanapplicationforSmartparkingapplicationusingpythonandDjangoforweb application

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COURSEOUTCOMES:

CO1: Understandthevariousconcept oftheIoTandtheirtechnologies **CO2:** Develop the IoT application using different hardware platforms **CO3:** Implement the various IoT Protocols

CO4: Understandthebasicprinciplesofcloudcomputing

CO5: DevelopanddeploytheIoTapplicationintocloudenvironment

TOTAL:75PERIODS

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1.Arshdeep Bahga, Vijay Madisetti, Internet of Things: A hands-on approach, Universities Press, 2015

2.Dieter Uckelmann, Mark Harrison, Florian Michahelles (Eds), Architecting the Internet of Things,Springer, 2011

3.PeterWaher,'LearningInternetofThings',PacktPublishing,2015

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5.N.Ida,Sensors,ActuatorsandTheirInterfaces:AMultidisciplinaryIntroduction,2nd EditionScitech Publishers, 202014

6.Reese, G. (2009). Cloud Application Architectures: Building Applications andInfrastructure in the Cloud. Sebastopol, CA: O'Reilly Media, Inc. (2009)

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GOBI (Tk), ERODE (Dt).

TRAFFIC PREDICTION AND FAST UPLINK FOR HIDDEN MARKOV IOT MODELS

PHASE II REPORT

Submitted by

CHARLY S

731221405002

In partial fulfillment for the award of the degree of

MASTER OF ENGINEERING

in

COMPUTER SCIENCE AND ENGINEERING

JKK MUNIRAJAH COLLEGE OF TECHNOLOGY,

T.N. PALAYAM, GOBI-638 506.

ANNA UNIVERSITY: CHENNAI 600025

OCTOBER 2023

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GOBI (Tk), ERODE (Dt).

ANNA UNIVERSITY, CHENNAI

BONAFIDE CERTIFICATE

Certified that this Report titled **"TRAFFIC PREDICTION AND FAST UPLINK FOR HIDDEN MARKOV IOT MODELS"** is the bonafide work of **"CHARLY S (731221405002)"** who carried out the project work under my supervision. Certified further that to the best of my knowledge the work reported hereindoes not form part of any other thesis or dissertation on the basis of which a degree or awardwas conferred on an earlier occasion on this or any other candidate.

SIGNATURE

HEAD OF THE DEPARTMENT

Dr.N.SATHYABALAJI.,M.E.,Ph.D
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SIGNATURE

SUPERVISOR

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Submitted for the Project Viva-voce Examination held on....29.10.2023...

INTERNAL EXAMINER

EXTERNAL EXAMINER

PRINCIPAL
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ABSTRACT

In this work, I present a novel traffic prediction and fast uplink (FU) framework for IoT networks controlled by binary Markov events. First, i apply the forward algorithm with hidden Markov models (HMMs) in order to schedule the available resources to the devices with maximum likelihood activation probabilities via the FU grant. In addition, i evaluate the regret metric as the number of wasted transmission slots to evaluate the performance of the prediction. Next, I have formulate a fairness optimization problem to minimize the Age of Information (AoI) while keeping the regret as minimum as possible. I proposed an iterative algorithm to estimate the model hyper parameters (activation probabilities) in a real-time application and apply an online-learning version of the proposed traffic prediction scheme. Simulation results show that the proposed algorithms outperform baseline models, such as time-division multiple access (TDMA) and grant-free (GF) random-access in terms of regret, the efficiency of system usage, and AoI.

CHAPTER 1

INTRODUCTION

Recent advances in the Internet of Things (IoT) has led to the deployment of a large number of machine type communication (MTC) devices to collect real-time information. The number of such IoT-MTC devices is rapidly growing to realize different use cases, such as environment monitoring, remote surgery, and autonomous vehicles . In 5G, MTC service modes are massive MTC (mMTC) and ultra reliable low-latency communication (URLLC) . The Quality-of-Service (QoS) demands vary among the service modes. In addition, many use cases have recently had more strict demands, which need extremely low end-to-end latency in a massive deployment of IoT devices to collect real-timeinformation . The behavior of the traffic of MTC devices (MTDs) differs from that of the traditional human-type communication devices (HTDs). The HTDs traffic tends to be heterogeneous, whereas the traffic of MTDs is homogeneous and highly correlated.

To elucidate traffic correlation in MTC, I consider the following road safety example as in Let event 1 and event 2 correspond to a vehicle moving down the street at normal speed, and a vehicle breaking the speed limit, respectively. Meanwhile, sensor 1 and sensor are motion detectors, necessary to control the traffic lights, and speed limit alarm, respectively. In this scenario, event 1 will be detected by sensor 1 only. However, both sensors may likely detect event 2. Hence, we infer that sensor 2 will not likely be active except if sensor 1 is active. Moreover, if sensor 2 is active, sensor 1 will most probably be active but not vice versa. In such a scenario, it is essential to estimate the possible sensor activation pattern and allocate resources at low latency. If a human is crossing the street, a human detector or a road safety alarm could then transmit a signal to the base station (BS).

The BS in turn sends a compulsory brake signal to a high-speed vehicle to enforce it to slow down the speed. This all should occur within a window of a few milliseconds to avoid an accident.

CHAPTER 9

CONCLUSION

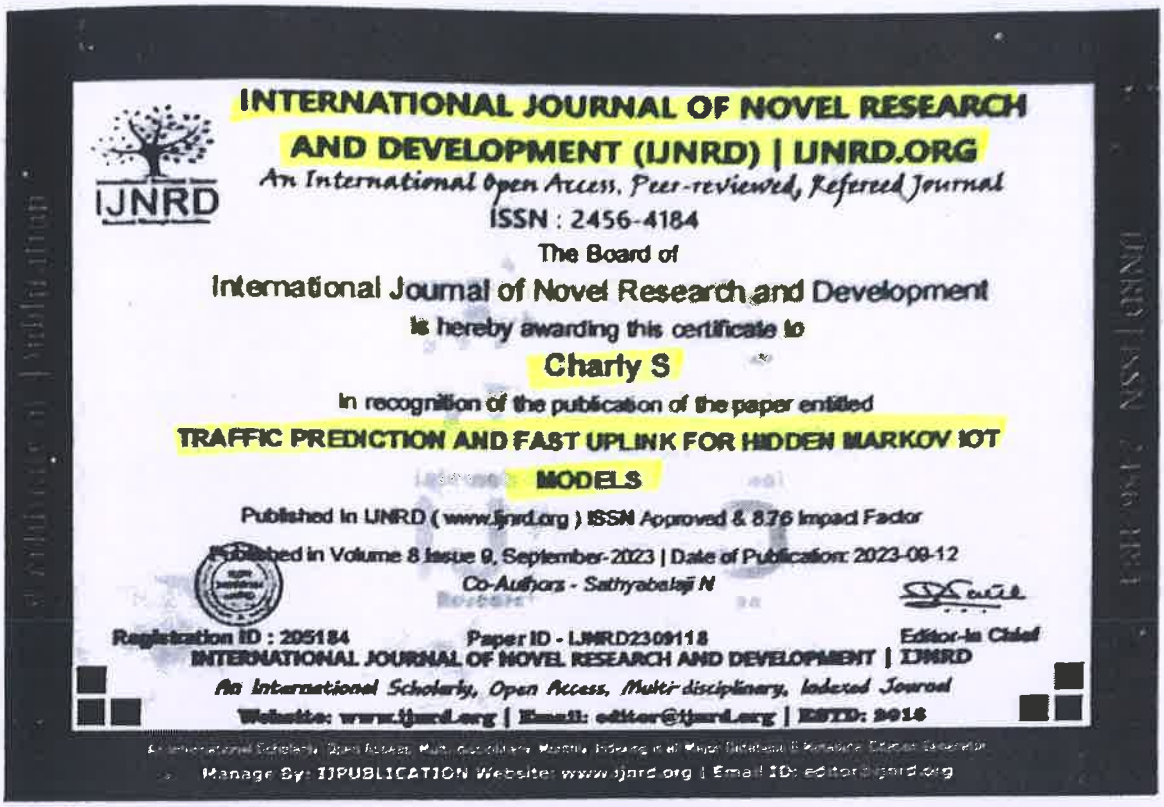
CONCLUSION:

This article considered the Markovian events which serve to model the activity of the massive deployment of IoT devices. I proposed an FU algorithm that efficiently predicts the activation pattern of the IoT devices based on the forward algorithm and grants the available resources to the devices with the highest likelihood of activation probabilities. I formulated an optimization problem that compromises a small value of the regret to minimize the AoI of the IoT devices and achieve a desirable degree of fairness. In addition, I formulated an expectation–maximization algorithm based on the Baum–Welsh procedure to estimate the system hyper parameters. Finally, i developed an online-learning version of the proposed scheme. Simulation results showed that the proposed algorithm outperforms the existing models, e.g., TDMA and GF. regarding regret, system usage efficiency, and AoI.

The proposed algorithms were much simpler than machine learning-based predictors regarding the complexity of the computations. Therefore, the proposed algorithms could be used as traffic predictors in critical applications, e.g., predictive UAV positioning . road safety, and other applications with low-latency communication demands .

APPENDIX-3

PAPER PUBLISHED PROOF



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ISSN:	2456-4184 | IMPACT FACTOR: 8.76 Calculated By Google Scholar| ESTD YEAR 2016 An International Scholarly Open Access Journal, Peer-Reviewed, Refereed Journal Impact Factor 8.76 Calculate by Google Scholar and Semantic Scholar | AI-Powered Research Tool, Multidisciplinary, Monthly, Multilanguage Journal Indexing in All Major Database & Metadata, Citation Generator
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CP4252	MACHINE LEARNING	LTPC 3024

COURSEOBJECTIVES:

- To understand the concepts and mathematical foundations of machine learning and types of problems tackled by machine learning
- Toexplorethedifferentsupervisedlearningtechniquesincludingensemblemethods
- Tolearndifferentaspectsofunsupervisedlearningandreinforcementlearning
- Tolearntheroleofprobabilisticmethodsformachine learning
- Tounderstandthebasicconceptsof neuralnetworksanddeep learning

UNITI INTRODUCTIONANDMATHEMATICALFOUNDATIONS **9**

WhatisMachineLearning?Need–History—Definitions—Applications-Advantages,Disadvantages &Challenges-TypesofMachineLearningProblems—MathematicalFoundations-LinearAlgebra&Analytical Geometry -Probability and Statistics- Bayesian Conditional Probability-Vector Calculus &Optimization-DecisionTheory-Informationtheory

UNITII SUPERVISEDLEARNING **9**

Introduction-DiscriminativeandGenerativeModels-LinearRegression-LeastSquares-Under-fitting /Overfitting -Cross-Validation—Lasso Regression-Classification -Logistic Regression-Gradient Linear Models -Support Vector Machines –Kernel Methods -Instance based Methods - K-Nearest Neighbors - Tree based Methods –Decision Trees –ID3—CART - Ensemble Methods –Random Forest-EvaluationofClassificationAlgorithms

UNITII UNSUPERVISEDLEARNINGANDREINFORCEMENTLEARNING I **9**

Introduction - Clustering Algorithms -K—Means—Hierarchical Clustering - Cluster Validity - Dimensionality Reduction –Principal Component Analysis—Recommendation Systems -EM algorithm.ReinforcementLearning—Elements-ModelbasedLearning—TemporalDifference Learning

UNITI PROBABILISTICMETHODSFORLEARNING V **9**

Introduction-NaïveBayesAlgorithm-MaximumLikelihood-MaximumApriori-BayesianBelief Networks-ProbabilisticModellingofProblems-InferenceinBayesianBeliefNetworks–Probability Density Estimation - Sequence Models – Markov Models – Hidden Markov Models

UNITV NEURALNETWORKSANDDEEPLEARNING **9**

NeuralNetworks—BiologicalMotivation-Perceptron—Multi-layerPerceptron—FeedForward Network – Back Propagation-Activation and Loss Functions- Limitations of Machine Learning – Deep Learning– Convolution Neural Networks – Recurrent Neural Networks – Use cases

45 PERIODS

SUGGESTEDACTIVITIES:

1. Giveanexamplefromourdailylifeforeachtypeofmachinelearning problem
2. Studyat least 3ToolsavailableforMachineLearning anddiscusspros&consof each
3. Takean exampleof aclassificationproblem.Drawdifferentdecision treesforthe example and explain the pros and cons of each decision variable at each level of the tree
4. Outline10machinelearningapplicationsinhealthcare
5. Give5exampleswheresequentialmodelsaresuitable.
6. Giveatleast5recentapplicationsof CNN

PRACTICALEXERCISES: **30 PERIODS**

1. Implement a Linear Regression with a Real Dataset (https://www.kaggle.com/harrywang/housing).Experimentwithdifferentfeaturesinbuildinga model. Tune the model's hyperparameters.
2. Implementa binary classification model. That is, answers a binary question such as "Are houses in this neighborhood above a certain price?"(use data from exercise 1). Modify the classification threshold and determine how that modification influences the model. Experiment with different classification metrics to determine your model's effectiveness.
3. Classification with Nearest Neighbors. In this question, you will use the scikit-learn's KNN classifier to classify real vs. fake news headlines. The aim of this question is for you to readthe scikit-learn API and get comfortable with training/validation splits. Use California Housing Dataset
4. Inthisexercise,you'llexperimentwithvalidationsetsandtestsetsusingthedataset.Split atraining set into a smaller training set and a validation set. Analyze deltas between training set and validation set results. Test the trained model with a test set to determine whether your trained model is overfitting. Detect and fix a common training problem.
5. Implementthek-meansalgorithmusinghttps://archive.ics.uci.edu/ml/datasets/Codon+usagedataset
6. Implement the Naïve Bayes Classifier using https://archive.ics.uci.edu/ml/datasets/Gait+Classificationdataset
7. Project-(inPairs)Yourprojectmust implementoneormoremachine learning algorithms and apply them to some data.

    a. Your project may be a comparison of several existing algorithms, or it may propose a new algorithm in which case you still must compare it to at least one other approach.
    b. Youcaneitherpickaprojectofyourowndesign,oryoucanchoosefromthesetof pre-defined projects.
    c. You are free to use any third-party ideas or code that you wish as long as it is publicly available.
    d. Youmust properlyprovide referencestoanywork that is notyour owninthewrite-up.
    e. ProjectproposalYoumustturninabriefprojectproposal.Yourprojectproposal should describethe ideabehind your project. Youshould also brieflydescribe software youwillneedtowrite, andpapers(2-3)youplanto read.

ListofProjects(datasetsavailable)

1. SentimentAnalysisofProductReviews
2. StockPrediction
3. SalesForecasting
4. MusicRecommendation
5. HandwritingDigitClassification
6. FakeNews Detection
7. Sports Prediction
8. ObjectDetection
9. DiseasePrediction

COURSEOUTCOMES:

Uponthecompletionofcourse,studentswillbeableto

CO1: Understandandoutlineproblemsforeachtypeofmachine learning

CO2: DesignaDecisiontreeandRandomforestfor anapplication

CO3: ImplementProbabilisticDiscriminativeandGenerativealgorithmsforanapplicationand analyze the results.

CO4: UseatooltoimplementtypicalClusteringalgorithmsfordifferenttypesof applications.

CO5: Designandimplementan HMMfor aSequenceModeltype of application andidentify applications suitable for different types of Machine Learning with suitable justification.

TOTAL:75PERIODS

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MEMORY AWARE ACTIVE LEARNING SENSOR FOR SYSTEM SERVER MONITORING

PHASE II REPORT

Submitted by

GAYATHRI S

731221405005

In partial fulfillment for the award of the degree of

MASTER OF ENGINEERING

in

COMPUTER SCIENCE AND ENGINEERING

JKK MUNIRAJAH COLLEGE OF TECHNOLOGY,

T.N. PALAYAM, GOBI-638 506.

ANNA UNIVERSITY: CHENNAI 600025

OCTOBER 2023

ANNA UNIVERSITY, CHENNAI

BONAFIDE CERTIFICATE

Certified that this Report titled **"MEMORY AWARE ACTIVE LEARNING SENSOR FOR SYSTEM SERVER MONITORING"** is the bonafide work of **"GAYATHRI S (731221405005)"** who carried out the project work under my supervision. Certified further that to the best of my knowledge the work reported here in does not form part of any other thesis or dissertation on the basis of which a degree or award was conferredon an earlier occasion on this or any other candidate.

SIGNATURE

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Submitted for the Project Viva-voce Examination held on 09/10/2023

INTERNAL EXAMINER

EXTERNAL EXAMINER

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GOBI (TK), ERODE (DT).

ABSTRACT

I propose a novel active learning framework for activity recognition and server monitoring. My work is unique in that it takes limitations of the oracle into account when selecting sensor data for annotation by the oracle. This capacity constraint is manifested not only in the number of queries that a person can respond to in a given time-frame but also in the time lag between the query issuance and the oracle response. I introduce the notion of mindful active learning and propose a computational framework, called EMMA, to maximize the active learning performance taking informativeness of system data, query budget, and human memory into account. I formulate this optimization problem, propose an approach to model memory retention, discuss the complexity of the problem, and propose a greedy heuristic to solve the optimization problem.

I design an approach to perform mindful active learning in batch where multiple system observations are selected simultaneously for querying the oracle. I demonstrate the effectiveness of our approach using three publicly available activity datasets and by simulating oracles with various memory strengths. I show that the activity recognition accuracy ranges from 21% to 97% depending on memory strength, query budget, and difficulty of the machine learning task. Moreover, I show that the performance of our approach is at most 20% less than the experimental upper-bound and up to 80% higher than the experimental lower-bound.

To evaluate the performance of EMMA for batch active learning, I design two instantiations of EMMA to perform active learning in batch mode. I show that these algorithms improve the algorithm training time at the cost of a reduced accuracy in performance. Another finding in our work is that integrating clustering into the process of selecting sensor observations for batch active learning improves the activity learning performance by 11.1% on average, mainly due to reducing the redundancy among the selected sensor observations.

I observe that mindful active learning is most beneficial when the query budget is small and/or the oracle's memory is weak. This observation emphasizes advantages of utilizing mindful active learning strategies in mobile health settings that involve interaction with older adults and other populations with cognitive impairments.

CHAPTER 1

INTRODUCTION

With the advent of the Internet-of-Things (IoT) paradigm, applications of sensor based systems have advanced significantly across many domains from health monitoring and autonomous vehicles to smart building and environmental monitoring. Mobile and wearable devices are being increasingly utilized, along with machine learning algorithms, to monitor physical and mental health, and to improve human well-being through clinical interventions. Most of these applications are human-centered in that they focus on monitoring human health and even interacting with humans to incorporate their feedback forimproved performance of the system.

The monitoring component often relies on computational algorithms that can detect important health events. For example, wearable sensors are extensively utilized to record human physiological data and then, computational algorithms such as machine learning models are applied for data analysis and to make predictions about events of interest. To train accurate machine learning models for different applications, such as activity recognition, an adequate number of labeled sensor data isrequired.

However, data collections and related experiments are mainly done in laboratory settings where the experiments are highly controlled. Unfortunately, models that are trained based on sensor data collected in controlled environments and laboratory settings perform extremely poorly when utilized in uncontrolled environments and outside clinics. Therefore consideration of real-world and uncontrolled settings has become increasingly important. Specifically, in human-centered applications, various limitations of human-beings, which can affect the performance of the trained models, need to be taken into account.

For an activity recognition classifier to be accurate, one needs to collect and label sensor data in end-user settings. Therefore, active learning is a natural choice for labeling the data where the end-user acts as the oracle agent and i iteratively query the user for correct labels. Throughout this article, the terms 'end-user' and 'oracle' are interchangeably used. In such ahuman-centered monitor setting, it is critical to design active learning strategies that are mindful of the user's cognitive and compliance capabilities.

CHAPTER 9

CONCLUSION

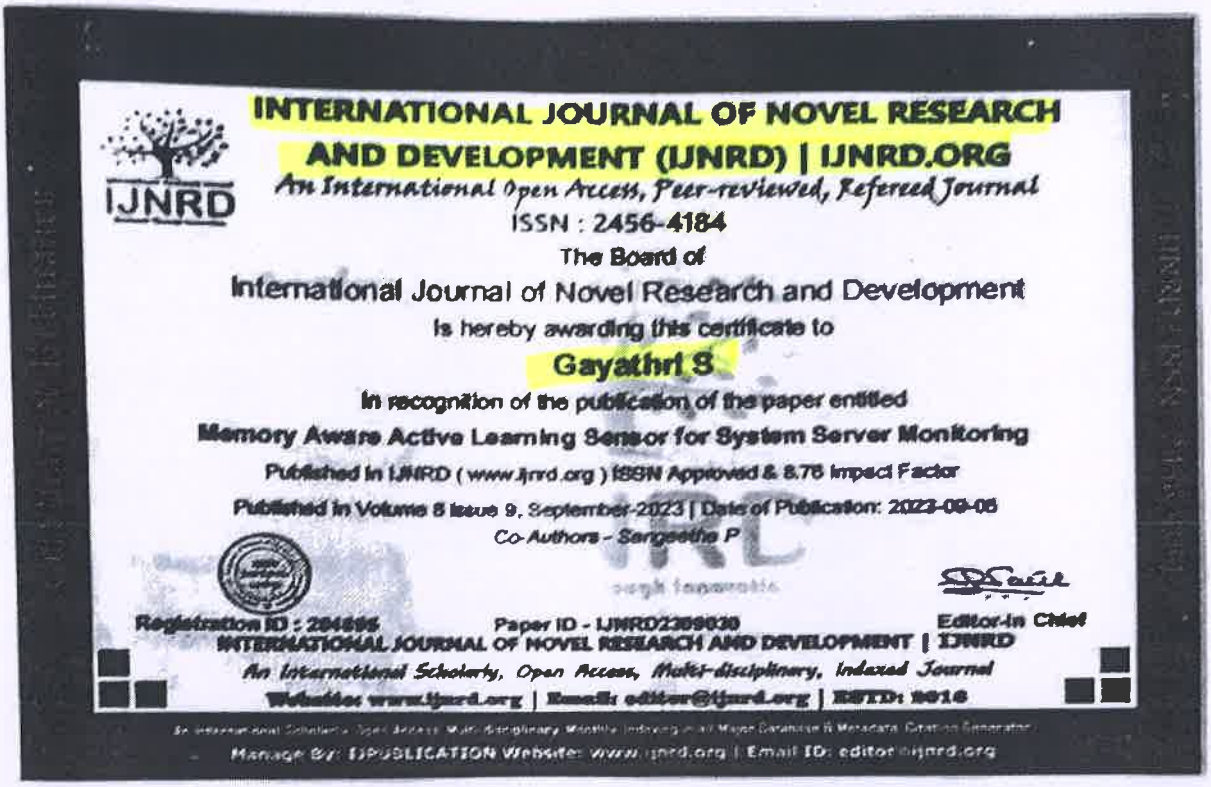
9.1 Conclusion

Prior research on active learning takes in formativeness of data and query budget into account when selecting the data for query. In this project, i showed that cognitive constraints of the oracle are of significant importance that can greatly compromise active learning performance. I posed an optimization problem to combine data uncertainty with memory retention for use in ubiquitous and mobile computing applications. I derived a greedy approximation algorithm to solve the proposed mindful active learning problem. My extensive analyses on three publicly available datasets showed that EMMA achieves up to 97% accuracy for activity recognition using wearable sensors. I also showed that integrating memory retention improves the active learning performance by 16%.

In this work, i simulated the memory strength of the end-user for validation purposes. My future work also focuses on conducting user studies that involve cognitive assessment of the user where i will assess the oracle's memory retentionquantitatively.

APPENDIX-3

PAPER PUBLISHED PROOF



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Gayathri S

In recognition of the publication of the paper entitled

Memory Aware Active Learning Sensor for System Server Monitoring

Published in IJNRD (www.ijnrd.org) ISSN Approved & 8.76 Impact Factor

Published in Volume 8 Issue 9, September-2023 | Date of Publication: 2023-09-06

Co-Authors - Sangeetha P

Registration ID : 204695 Paper ID - IJNRD2309030 Editor-in Chief

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Published Paper PDF : [redacted]

2 Cryptology: Tool for IoT Security [redacted]

Authors: Aryan Sanjeev

Registration ID: 204607 | Published Paper ID: IJNRD2309031

Year : September-2023 | Volume : 8 | Issue : 9

Approved ISSN : 2456-4184 | Country : Patna, Delhi, India

DOI Number: 10.6084/m9.figshare.24000731

Page No : d293-d294 | No of times Downloads: 0026

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Published Paper PDF : [redacted]

3 Memory Aware Active Learning Sensor for System Server Monitoring [redacted]

Authors: Gayathri S, Sangeetha P

Registration ID: 204695 | Published Paper ID: IJNRD2309030

Year : September-2023 | Volume : 8 | Issue : 9

Approved ISSN : 2456-4184 | Country : Erode, Tamilnadu, India

DOI Number: 10.6084/m9.figshare.24000730

Page No : d245-d255 | No of times Downloads: 0047

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Published Paper PDF : [redacted]

4 Review on "Traditional Processing Methods for Increasing Bioavailability of Nutrients Present in Cereals" [redacted]

Authors: Ayesha Tabrez Khan

Registration ID: 204643 | Published Paper ID: IJNRD2309029

Year : September-2023 | Volume : 8 | Issue : 9

Approved ISSN : 2456-4184 | Country : Indore, Madhya Pradesh, India

DOI Number: 10.6084/m9.figshare.24000729

Page No : d241-d244 | No of times Downloads: 00106

Published Paper URL : [redacted]

Published Paper PDF : [redacted]

SE4151 **ADVANCED SOFTWARE ENGINEERING** **LTP C**

3003

COURSEOBJECTIVES:

- Tounderstandtherationaleforsoftwaredevelopmentprocessmodels
- Tounderstandwhythearchitecturaldesignofsoftwareis important;
- Tounderstandthefiveimportantdimensionsofdependability,namely,availability, reliability, safety, security, and resilience.
- Tounderstandthebasicnotionsofawebservice,webservicestandards,andservice- oriented architecture;
- To understand the different stages of testing from testing during development of a software system

UNITI SOFTWAREPROCESS&MODELING **9**

Prescriptive Process Models – Agility and Process – Scrum – XP – Kanban – DevOps – Prototype Construction—Prototype Evaluation—Prototype Evolution—Modelling—Principles—RequirementsEngineering–Scenario-basedModelling–Class-basedModelling–Functional Modelling – Behavioural Modelling.

UNITII SOFTWAREDESIGN **9**

DesignConcepts–DesignModel–SoftwareArchitecture–ArchitecturalStyles–Architectural Design—Component-LevelDesign—UserExperienceDesign—DesignforMobility—Pattern-Based Design.

UNITIII SYSTEMDEPENDABILITYANDSECURITY **9**

Dependable Systems – Dependability Properties – Sociotechnical Systems – Redundancy and Diversity – Dependable Processes – Formal Methods and Dependability – Reliability Engineering – Availability and Reliability – Reliability Requirements – Fault-tolerant Architectures – Programmingfor Reliability – Reliability Measurement – Safety Engineering – Safety-critical Systems – Safety Requirements – Safety EngineeringProcesses – Safety Cases– Security Engineering– Security and Dependability – Safety and Organizations – Security Requirements – Secure System Design – SecurityTestingandAssurance—ResilienceEngineering—Cybersecurity—Sociotechnical Resilience – Resilient Systems Design.

UNIT IV SERVICE-ORIENTEDSOFTWAREENGINEERING,SYSTEMSENGINEERING ANDREAL-TIMESOFTWAREENGINEERING **9**

Service-oriented Architecture – RESTful Services – Service Engineering – Service Composition – SystemsEngineering–SociotechnicalSystems–ConceptualDesign–SystemProcurement–SystemDevelopment—SystemOperationandEvolution—Real-timeSoftwareEngineering—EmbeddedSystemDesign–ArchitecturalPatternsforReal-timeSoftware–TimingAnalysis–Real-time Operating Systems.

UNITV SOFTWARETESTINGANDSOFTWARECONFIGURATIONMANAGEMENT **9**

SoftwareTestingStrategy—UnitTesting—IntegrationTesting—Validation Testing—System

Testing—Debugging—White-BoxTesting—BasisPathTesting—ControlStructureTesting—Black-BoxTesting—SoftwareConfigurationManagement(SCM)—SCMRepository—SCM Process – Configuration Management for Web and Mobile Apps.

SUGGESTEDACTIVITIES

1. ComparativelyanalysingdifferentAgilemethodologies.
2. Describingthescenarioswhere'Scrum'and'Kanban'areused.
3. Mappingthedataflowintosuitablesoftware architecture.
4. Developingbehaviouralrepresentationsforaclassorcomponent.
5. ImplementingsimpleapplicationsasRESTfulservice.

TOTAL:45PERIODS

COURSEOUTCOMES:

TheStudentswillbeableto

CO1:IdentifyappropriateprocessmodelsbasedontheProjectrequirements

CO2: UnderstandtheimportanceofhavingagoodSoftware Architecture.

CO3:Understandthefiveimportantdimensionsofdependability,namely,availability,reliability, safety, security, and resilience.

CO4: Understand the basic notions of a web service, web service standards, and service-oriented architecture;

CO5: BefamiliarwithvariouslevelsofSoftwaretesting

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5. FundamentalsofSoftwareEngineering,5thEdition,RajibMall,PHILearningPrivateLtd, 2018

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Discriminate Gabor Ensemble Filter using Hyper Spectral Image Categorization

A PROJECT REPORT (PHASE-II)

Submitted by

INDIRAN R

731221405006

in partial fulfillment for the award of the degree of

MASTER OF ENGINEERING

in

COMPUTER SCIENCE AND ENGINEERING

JKK MUNIRAJAH COLLEGE OF TECHNOLOGY

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ANNA UNIVERSITY: CHENNAI 600 025

OCTOBER 2023

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BONAFIDE CERTIFICATE

Certified that this Report titled **"Discriminate Gabor Ensemble Filter using Hyper Spectral Image Categorization"** is the bonafide work of **"INDIRAN R (731221405006)"** who carried out the project work under my supervision. Certified further that to the best of my knowledge the work reported herein does not form part of any other thesis or dissertation on the basis of which a degree or award was conferred on an earlier occasion on this orany other candidate.

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Submitted for the project viva voce Examination held on 9/10/2023 - FN

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ABSTRACT

The fixed Gabor filters can extract common features with different scales and orientations, while the learnable filters can learn some complementary features that Gabor filters cannot extract. Based on GEF, we design network architecture for HSI classification, which extracts deep features and can learn from limited training samples. In order to simultaneously learn more discriminative features and an end-to-end system, we propose to introduce the local discriminate structure for cross-entropy loss by combining the triplet hard loss. Results of experiments on three HSI datasets show that the proposed method has significantly higher classification accuracy than other state-of-the-art methods. Moreover, the proposed method is speedy for both training and testing. For a broad range of applications, hyper spectral image (HSI) classification is a hot topic in remote sensing, and convolutional neural network (CNN)-based methods are drawing increasing attention.

However, to train millions of parameters in CNN requires a large number of labeled training samples, which are difficult to collect. A conventional Gabor filter can effectively extract spatial information with different scales and orientations without training, but it may be missing some important discriminative information. In this article, we propose the Gabor ensemble filter (GEF), a new convolutional filter to extract deep features for HSI with fewer trainable parameters. GEF filters each input channel by some fixed Gabor filters and learnable filters simultaneously, and then reduces the dimensions by some learnable 1×1 filters to generate channels.

CHAPTER 1

INTRODUCTION

AHYPERSPECTRAL image (HSI) contains hundreds of continuous bands in the ultraviolet, visible, and infrared regions, which effectively combine spatial and spectral information. HSI classification, that is, classifying every pixel with a certain land-cover type, is the cornerstone of HSI analysis. It has a broad range of applications, including land cover mapping, mineral exploration, water-pollution detection, natural disasters, and biological threats. Many HSI classification algorithms have been proposed over the past decade, including subspace-based methods, support vector machine (SVM), extreme learning machine (ELM), sparse representation classifier (SRC), low rank representation, extended morphological attribute profiles (EMAPs), invariant attribute profiles (IAPs), etc. Deep-learning-based methods have drawn much attention recently in image classification. Deep learning uses a neural network with multiple hidden layers to automatically learn features from the original image, layer by layer, with better results compared to conventional shallow methods. For HSI, the number of labeled samples is limited, because it takes effort to determine the class of each pixel. Some unsupervised deep-learning methods, including stacked automatic encoder (SAE) and deep brief network (DBN), have been proposed to extract features for HSI. However, since SAE- and DBN-based methods only have 1-D fully connected layers, they cannot automatically learn spatial features.

CHAPTER 9

CONCLUSION AND FUTURE SCOPE

Conclusion And Future Scope

Which filters each input channel by fixed Gabor filters together with learnable filters, followed by some learnable 1 × 1 filters to generate the output channels. Based on the proposed GEF, we designed a network architecture for HSI classification. To learn more discriminative features and an end-to-end system at the same time, we proposed to introduce the local discriminant structure for cross-entropy loss by combining the triplet hard loss. With limited training samples, the proposed method performs significantly better than other state-of-the-art HSI classification methods. Moreover, the proposed method is fast for both training and testing. However, the proposed method cannot obtain higher accuracy for normal image classification, because the input for the proposed network is a small image patch with many channels, which is only designed for HSI classification with limited training samples. For normal image classification, an image is a sample. When there are millions of training samples, the network should be much more complex and deeper to obtain better performance.In our future work, we will investigate how to improve the proposed method for the normal image classification task, and how to combine other conventional features with CNN to obtain better performance.

APPENDIX-III

PUBLICATION PROOF

Certificate of Publication

This is to certify that

R.Indiran,Dr.N.Sathyabalaji

Published following article

Discriminate Gabor Ensemble Filter using Hyper Spectral Image Categorization

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GOBI (TK), ERODE (Dt).

CP4391 **SECURITY PRACTICES** LTPC 3003

COURSEOBJECTIVES:

- Tolearnthecorefundamentalsof systemandwebsecurityconcepts
- Tohavethroughunderstanding inthesecurityconceptsrelatedtonetworks
- Todeploythesecurityessentialsin ITSector
- Tobe exposedtotheconceptsof CyberSecurityandcloudsecurity
- ToperformadetailedstudyofPrivacyandStoragesecurityandrelatedIssues

UNITI SYSTEMSECURITY 9

Model of network security – Security attacks, services and mechanisms – OSI security architecture - A Cryptography primer- Intrusion detection system- Intrusion Prevention system - Security web applications-Casestudy:OWASP-Top10WebApplicationSecurityRisks.

UNITII NETWORKSECURITY 9

Internet Security - Intranet security- Local Area Network Security - Wireless Network Security - Wireless Sensor Network Security- Cellular Network Security - Mobile security - IOT security - Case Study - Kali Linux.

UNITIII SECURITYMANAGEMENT 9

Information security essentials for IT Managers- Security Management System - Policy Driven System Management- IT Security - Online Identity and User Management System. Case study: Metasploit

UNITIV CYBERSECURITYANDCLOUDSECURITY 9

Cyber Forensics- Disk Forensics – Network Forensics – Wireless Forensics – Database Forensics – MalwareForensics–MobileForensics–EmailForensics-Bestsecuritypracticesforautomate Cloud infrastructure management – Establishing trust in IaaS, PaaS, and SaaS Cloud types. Case study: DVWA

UNITV PRIVACYANDSTORAGESECURITY 9

Privacy on the Internet - Privacy Enhancing Technologies - Personal privacy Policies - Detection of Conflicts in security policies- privacy and security in environment monitoring systems. Storage Area Network Security - Storage Area Network Security Devices - Risk management - Physical Security Essentials.

COURSEOUTCOMES:

CO1: Understand the core fundamentals of system security**CO2:**Applythesecurityconceptstowiredandwirelessnetworks **CO3**:ImplementandManagethesecurityessentialsinITSector **CO4:**ExplaintheconceptsofCyberSecurityandCyberforensics **CO5:**BeawareofPrivacyandStoragesecurityIssues.

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TOTAL:45PERIODS

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GOBI (Tk), ERODE (Dt).

AN INTRUSION DETECTION PROCESS BASE ON MACHINE LEARNING SPECTATOR COMMUNICATION SYSTEMS

A PROJECT REPORT (PHASE – II)

Submitted by

NAVEEN S

731221405008

in partial fulfilment for the award of the degree of

MASTER OF ENGINEERING

in

COMPUTER SCIENCE AND ENGINEERING

JKK MUNIRAJAH COLLEGE OF TECHNOIOGY

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OCTOBER 2023

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ANNA UNIVERSITY,CHENNAI

BONAFIDE CERTIFICATE

Certified that this Report titled **"AN INTRUSION DETECTION PROCESS BASE ON MACHINE LEARNING SPECTATOR COMMUNICATION SYSTEMS"** is the bonafide work of **"NAVEEN S(731221405008)"** who carried out the project work under my supervision. Certified further that to the best of my knowledge the work reported herein does not form part of any other thesis or dissertation on the basis of which a degree or award was conferred on an earlier occasion on this or any other candidate.

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Submitted for the project viva Examination held on 9/10/2023. F.N

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EXTERNAL EXAMINAR

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GOBI (Tk), ERODE (Dt).

ABSTRACT

The first layer is used to detect and identify wireless network attacks based on machine learning algorithms such as Random Forest Algorithm and Gradient Boosting Decision Tree Algorithm. The second layer is used to detect abnormal physical conditions of train movement based on state observers. By combining the results of the above two layers, a comprehensive intrusion detection result is presented. Simulation results show that the proposed method is effective and practical. In order to ensure the information security of vehicle-ground communication system, this paper proposes an intrusion detection method based on machine learning and state observers to detect and identify various attacks. Communication-based train control (CBTC) systems are typical cyber-physical systems in urban rail transport. The vehicle-ground communication system is a very important subsystem in the CBTC system, which uses wireless communication protocols to transmit control commands. However, it also faces some potential information security risks. The detection system can not only detect the abnormality of the wireless network data, but also detect the abnormality of the physical condition of the train. The method consists of two layers.

CHAPTER 1

INTRODUCTION

AT PRESENT, with the development of economy and the expansion of city scale, urban rail transit has been a primary passenger transportation method. The communication-based train control (CBTC) system, as a popular train operation control system, is widely used in urban rail transit. In the CBTC system, the train-ground communication subsystem is a critical security-related subsystem. It adopts wireless protocols to transmit control commands and train state information. Because of openness and vulnerability of wireless communication, the train-ground communication system can be a potential target for an attacker.

Once the train-ground communication system suffers from an attack, the train operation will become less efficient. In serious cases, train operation security accidents can happen. Therefore, in the CBTC system, it is vital to ensure the security of the train-ground communication system .For traditional information technology (IT) networks, various schemes are proposed to defense attacks. Especially, the intrusion detection method is a primary information security defense method, which can be divided into anomaly detection and misuse detection .The anomaly detection method needs to model normal behaviors accurately. Based on the normal behavior model, this method determines whether a newly received data is abnormal. The anomaly detection method can detect zero-day attacks. However, this method usually has a higher false positive rate, because any tiny change different from the normal model can cause an attack alarm. Besides, this method can only detect an abnormal behavior, but cannot identify its attack type. The misuse detection method needs to model a specific attack behavior in advance, which causes this method not to detect unknown attacks, for example zero-day attacks. This method also needs to manually update the attack model database when a new attack is identified. In addition, there are some intrusion detection methods that combine anomaly detection and misuse detection methods, called hybrid intrusion detection methods, which can avoid the disadvantages of each method.

CHAPTER 8
CONCLUSION AND FUTURE SCOPE

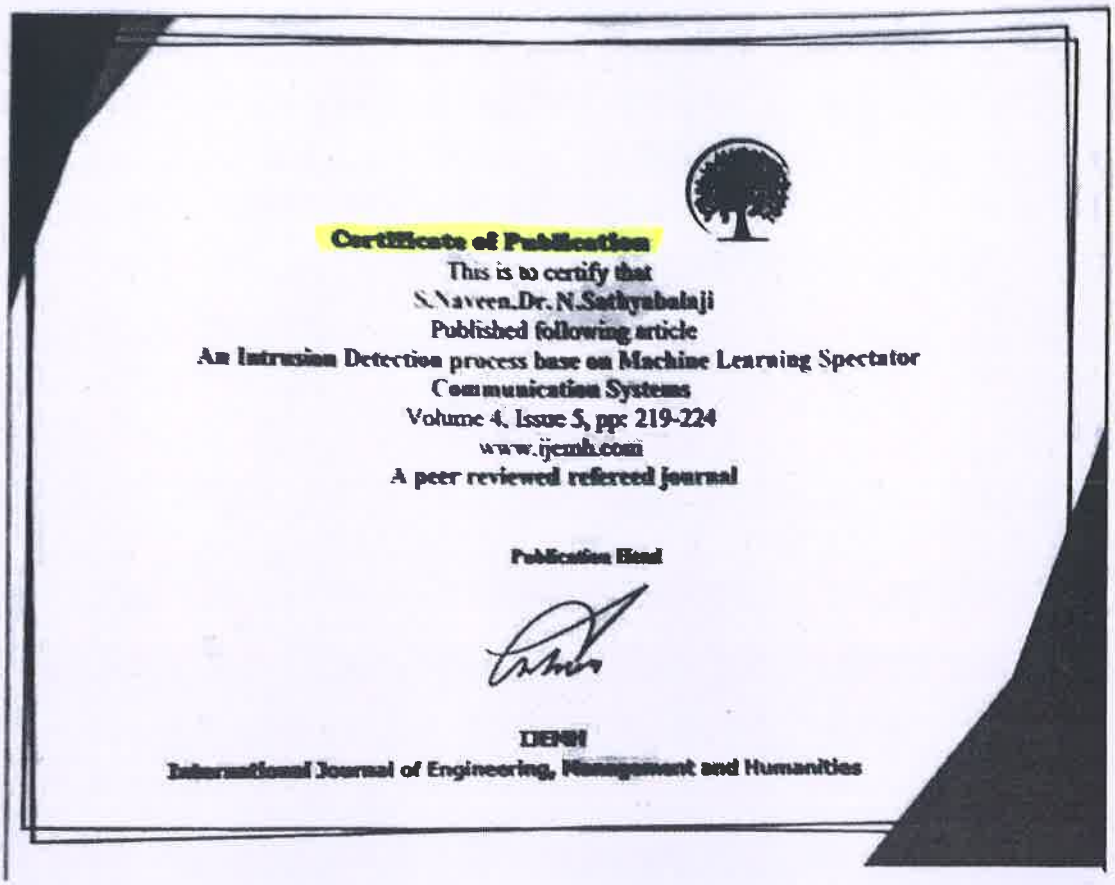
8.1 Conclusion And Future Scope

An intrusion detection method based on machine learning and state observer is proposed in the train-ground communication system. The method includes two layers. In the first layer, machine learning algorithms are used to detect and identify the intrusion behavior on wireless network data. The machine learning algorithms include the random forest algorithm, the gradient boosted decision tree algorithm, the AdaBoost algorithm and the support vector machine algorithm. Further, in the second layer, an intrusion detection method based on state observer is proposed to recognize the abnormal train physical states. Finally, based on the detection results of wireless network data and train physical states, a reliable intrusion detection result is given, which is important for CBTC systems. Both theoretical analysis and simulation results show that only long-term continuous attacks can affect the train's operation, while short-term continuous or random attacks do not affect the train's operation.

Based on these experiments, some conclusions can be drawn. If the intrusion detection only focuses on the network layer, invalid alarms and defenses will increase, which aggravates the system overhead. If the intrusion detection only focuses on physical layer, the detection result has serious hysteresis, which means that the attack cannot be reported in time. When the attack is recognized, the system has been greatly affected and an emergency braking or collision will be inevitable. In the proposed method, the attack is simultaneously detected in the network layer and the physical layer. And the results are comprehensively analyzed.

APPENDIX-3

PUBLICATION PROOF



Certificate of Publication

This is to certify that

S.Naveen,Dr. N.Sathyabalaji

Published following article

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International Journal of Engineering, Management and Humanities

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GOBI (Tk), ERODE (Dt).

MP4251 **CLOUD COMPUTING TECHNOLOGIES** L TPC 3003

COURSEOBJECTIVES:

- TogainexpertiseinVirtualization,VirtualMachinesanddeploypracticalvirtualization solution
- Tounderstandthearchitecture,infrastructureanddeliverymodelsofcloudcomputing.
- ToexploretherosterofAWSservicesandillustratethewaytomakeapplicationsinAWS
- Togainknowledgeintheworking ofWindows Azure andStorage servicesofferedby Windows Azure
- Todeveloptheclоudapplicationusingvariousprogrammingmodelof HadoopandAneka

UNITI VIRTUALIZATIONANDVIRTUALIZATIONINFRASTRUCTURE 6

Basics of Virtual Machines - Process Virtual Machines – System Virtual Machines –Emulation – Interpretation – Binary Translation - Taxonomy of Virtual Machines. Virtualization –Management Virtualization — Hardware Maximization – Architectures – Virtualization Management – Storage Virtualization—NetworkVirtualization-Implementationlevelsofvirtualization— virtualization structure—virtualization of CPU, Memory and I/O devices—virtual clusters and Resource Management – Virtualization for data center automation

UNITII CLOUDPLATFORM ARCHITECTURE 12

CloudComputing:Definition,Characteristics-Clouddeploymentmodels:public,private,hybrid, community—Categories of cloud computing: Everything as a service: Infrastructure, platform, software- A Generic Cloud Architecture Design—Layered cloud Architectural Development—ArchitecturalDesignChallenges

UNITIII AWSCLOUDPLATFORM- IAAS 9

Amazon Web Services:AWS Infrastructure- AWS API- AWS Management Console - Setting up AWS Storage - Stretching out with Elastic Compute Cloud - Elastic Container Service for Kubernetes-AWS Developer Tools: AWS Code Commit, AWS Code Build, AWS Code Deploy, AWS Code Pipeline, AWS code Star - AWS Management Tools: Cloud Watch, AWS Auto Scaling, AWS control Tower, Cloud Formation, Cloud Trail, AWS License Manager

UNITIV PAASCLOUDPLATFORM 9

Windows Azure: Origin of Windows Azure, Features, The Fabric Controller —First Cloud APP in Windows Azure- Service Model and Managing Services: Definition and Configuration, Service runtimeAPI-WindowsAzureDeveloper Portal- Service Management API-WindowsAzureStorage Characteristics-Storage Services- REST API- Blops

UNITV PROGRAMMINGMODEL 9

Introduction to Hadoop Framework - Mapreduce, Input splitting, map and reduce functions, specifying input and output parameters, configuring and running a job –Developing Map Reduce Applications - Design of Hadoop file system –Setting up Hadoop Cluster- Aneka: Cloud Application Platform, Thread Programming, Task Programming and Map-Reduce Programming in Aneka

COURSEOUTCOMES:

CO1: Employtheconceptsofvirtualizationinthecloudcomputing

CO2: Identifythearchitecture,infrastructureanddeliverymodelsofcloudcomputing

CO3: DeveloptheCloudApplicationinAWSplatform

CO4:ApplytheconceptsofWindowsAzuretodesignCloudApplication

CO5: DevelopservicesusingvariousCloudcomputingprogrammingmodels.

TOTAL:45PERIODS

REFERENCES

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2. Raoul Alongi, AWS: The Most Complete Guide to Amazon Web Service from Beginner to Advanced Level, Amazon Asia- Pacific Holdings Private Limited, 2019.
3. SriramKrishnan,Programming:WindowsAzure,O'Reilly,2010.
4. RajkumarBuyya,ChristianVacchiola,S.ThamaraiSelvi,MasteringCloudComputing, MCGraw Hill Education (India) Pvt. Ltd., 2013.
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6. Jim Smith, Ravi Nair , "Virtual Machines: Versatile Platforms for Systems and Processes", Elsevier/Morgan Kaufmann, 2005.
7. JohnW.RittinghouseandJamesF.Ransome,"CloudComputing:Implementation,Management, and Security", CRC Press, 2010
8. Toby Velte, Anthony Velte, Robert Elsenpeter, "Cloud Computing, A Practical Approach", McGraw-Hill Osborne Media, 2009.
9. TomWhite,"Hadoop:TheDefinitiveGuide",YahooPress, 2012.

COURSEOUTCOMES:

CO1: Identifyvariousconcepts ofmobileprogrammingthatmakeit uniquefrom programmingfor other platforms

CO2: Create,testanddebugAndroidapplicationbysettingupAndroiddevelopment

CO3: Demonstratemethodsinstoring,sharingandretrievingdatainAndroidapplications

CO4: Utilizerapidprototypingtechniquestodesignanddevelopsophisticatedmobileinterfaces

CO5: Createinteractiveapplicationsinandroidusingdatabaseswithmultipleactivities including audio, video and notifications and deploy them in marketplace

TOTAL:75PERIODS

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2.GoogleDeveloperTraining,"AndroidDeveloperFundamentalsCourse—Concept Reference",GoogleDeveloperTrainingTeam,2017.

3.PrasanthKumarPattnaik,RajibMall,"FundamentalsofMobileComputing",PHILearning Pvt.Ltd,New Delhi-2012

4.RetoMeier,"ProfessionalAndroid2ApplicationDevelopment",WileyIndiaPvtLtd,2010

5.MarkLMurphy, "BeginningAndroid",WileyIndiaPvtLtd,2009

6.Dawn Griffiths and David Griffiths, "Head First Android Development", 1st Edition, O"Reilly SPD Publishers, 2015. ISBN-13: 978-9352131341

7.ErikHellman,"AndroidProgramming–PushingtheLimits",1stEdition,WileyIndiaPvtLtd, 2014.ISBN-13:978-8126547197.
8.BillPhillips,ChrisStewartandKristinMarsicano,"AndroidProgramming:TheBigNerd Ranch Guide", 4th Edition, Big Nerd Ranch Guides, 2019. ISBN-13: 978-0134706054

RICE PLANT DISEASES CLASSIFICATION USING IMAGE PROCESSING

PHASE II REPORT

Submitted by

PONMANI.A

731221405009

in partial fulfillment for the award of the degree of

MASTER OF ENGINEERING

in

COMPUTER SCIENCE AND ENGINEERING

J.K.K.MUNIRAJAH COLLEGE OF TECHNOLOGY,

T.N.PALAYAM, GOBI-638 506

ANNA UNIVERSITY::CHENNAI 600 025

OCTOBER 2023

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GOBI (Tk), ERODE (Dt).

ANNA UNIVERSITY::CHENNAI 600 025

BONAFIDE CERTIFICATE

Certified that this project report on **"RICE PLANT DISEASES CLASSIFICATION USING IMAGE PROCESSING"** is the bonafide work of **"PONMANI A (731221405009)"** who carried out the project work under my supervision. Certified further that to the best of my knowledge the work reported herein does not form part of any other thesis or dissertation on the basis of which a degree or award was conferred on an earlier occasion on this or any other candidate

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ABSTRACT

Rice is considered one the most important plants globally because it is a source of food for over half the world's population. Like other plants, rice is susceptible to diseases that may affect the quantity and quality of produce. It sometimes results in anywhere between 20–40% crop loss productions. Early detection of these diseases can positively affect the harvest, and thus farmers would have to be knowledgeable about the various disease and how to identify them visually. Even then, it is an impossible task for farmers to survey the vast farmlands on a daily basis. Even if this is possible, it becomes a costly task that will, in turn, increases the price of rice for consumers. Machine learning algorithms fitted to drone technology combined with the Internet of Things (IoT) can offer a solution to this problem. In this project, a Deep Convolutional Neural Network (DCNN) transfer learning-based approach for the accurate detection and classification of rice leaf disease.

CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION

Rice is one of the most consumed foods globally as it is a main source of diet for many countries, including the most populated countries such as China, India, Pakistan, and others. The classification of Rice is under the class Orza type, which includes within that family other grain foods such as wheat, corn, and cereal. The reason why it is popular is that it is rich in supplements, minerals, and nutrition. It is estimated that it is a basic diet choice for more than three billion people.

Rice is a very general term because there are many types of rice around the globe and even the way they are grown varies as well. However, it should be mentioned that all rice plants share some commonalities in their development which are specifically three phases of development before harvest.

A total of 15% of agricultural farm areas around the world are used for rice farming. The main production of rice is in the east of India and Pakistan. Recently, there has been a noticeable reduction in rice production for various reasons. One of the main causes is rice plant disease or maladies. One of the most unwanted maladies is what is referred to as sheath blight, leaf blasts, and brown spots because they greatly affect rice production or grain quality.

The maladies, though different, in effect, share the commonality of having spots on the plant leaves. Like many diseases, early detection can reduce or prevent the associated damage. The fundamental issue is the absence of constant observation of the plants.

CHAPTER 12

CONCLUSION AND FUTURE SCOPE

12.1 CONCLUSION

Leaves are among the main parts of plants where diseases are visibly apparent. Different diseases affect the leaves in different ways that make them distinct from each other. Rice plants are very important because it is a source of food for over half the population of the world. Diseases that infect rice plants greatly affect the quality and quantity of rice produced. It is estimated that rice disease can cause 20–40% production loss annually. The manual detection of these diseases requires disease knowledge from farmers and requires extensive work to visually observe vast farmlands with individual rice crops to achieve the task of early diagnosis. This seems to be an impossible task, and even if it was possible, this would be a very expensive task that would end up increasing the price of rice for consumers.

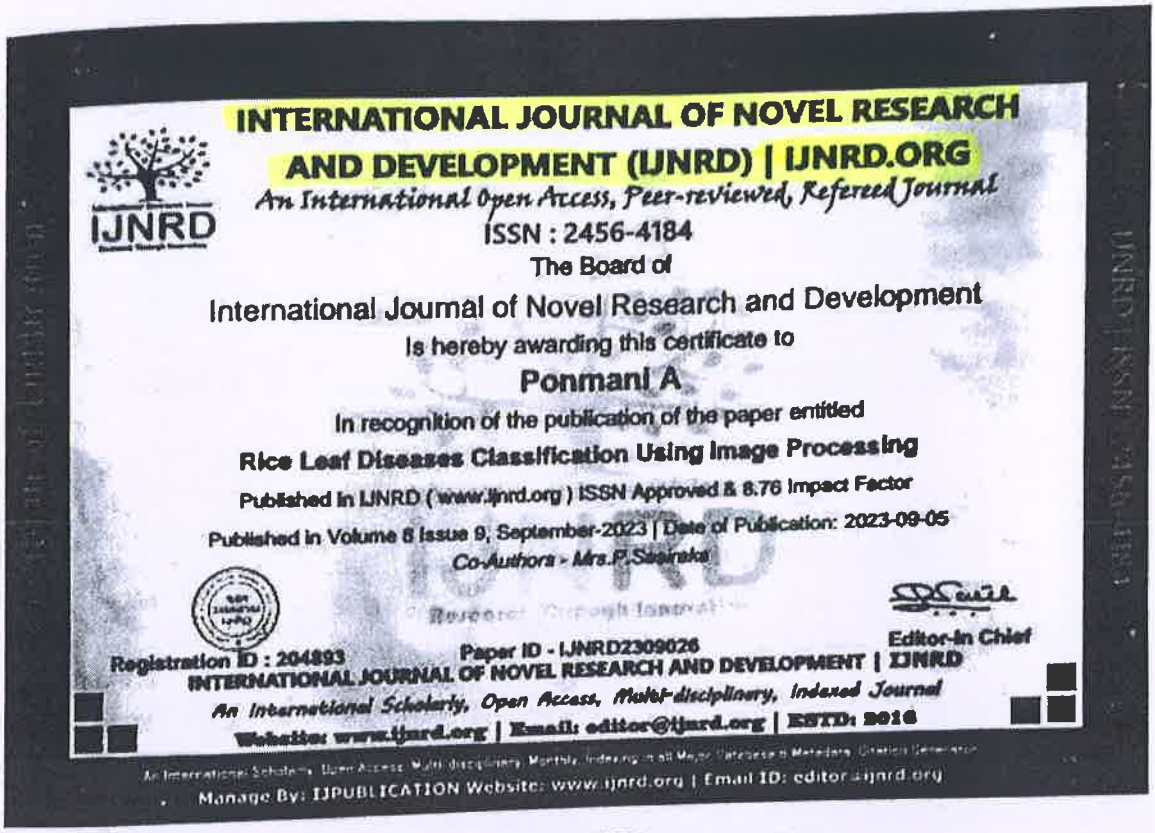
It will include a complete drone technology-based IoT Technology based deep learning system that can be practically tested in real-life real-time scenarios. In addition, work will continue in our pursuit of the optimal deep learning technique able to diagnose all the rice leaf diseases that exist. In addition, and related to the field of agriculture, we plan to explore other plant leaf diseases of plants that are similarly important to humankind.

12.2 FUTURE SCOPE

For future work, this project evaluates the techniques in data mining and image processing in use by researchers designed for detection, diagnosis and recognition of plant diseases. Still lot of research is going on for to produce and automated plant diseases detection via mobile phone captured images.

APPENDIX 3

PUBLICATION PROOF



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Ponmani A

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Published in Volume 8 Issue 9, September-2023 | Date of Publication: 2023-09-05

Co-Authors - Mrs.P.Sasireka

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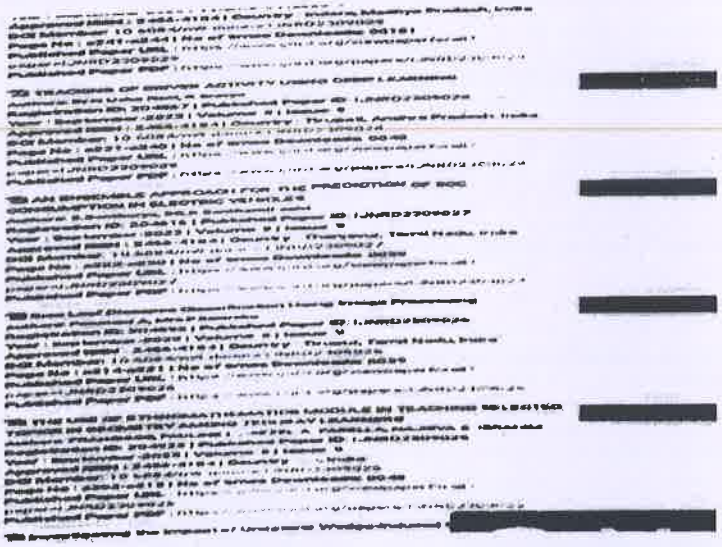

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CP4153 **NETWORK TECHNOLOGIES** LTPC 3003

COURSEOBJECTIVES:

- Tounderstandthebasicconceptsofnetworks
- Toexplorevarioustechnologiesinthewirelessdomain
- Tostudyabout4G and5Gcellularnetworks
- TolearnaboutNetworkFunctionVirtualization
- TounderstandtheparadigmofSoftwaredefinednetworks

UNITI NETWORKINGCONCEPTS 9

PeerToPeerVsClient-ServerNetworks.NetworkDevices.NetworkTerminology.Network Speeds.Networkthroughput,delay.OsiModel.Packets,Frames,AndHeaders.CollisionAnd BroadcastDomains.LANVsWAN.NetworkAdapter.Hub.Switch.Router.Firewall,IP addressing.

UNITII WIRELESSNETWORKS 9

Wireless access techniques- IEEE 802.11a, 802.11g, 802.11e, 802.11n/ac/ax/ay/ba/be, QoS – Bluetooth–ProtocolStack–Security–Profiles–zigbee

UNITIII MOBILEDATANETWORKS 9

4GNetworksandCompositeRadioEnvironment–ProtocolBoosters–Hybrid4GWireless Networks Protocols—Green Wireless Networks—Physical Layer and Multiple Access—Channel Modelling for 4G – Concepts of 5G – channel access –air interface -Cognitive Radio-spectrum management – C-RAN architecture - Vehicular communications-protocol – Network slicing – MIMO, mmWave, Introduction to 6G.

UNITIV SOFTWAREDEFINEDNETWORKS 9

SDN Architecture. Characteristics of Software-Defined Networking. SDN- and NFV-Related Standards. SDN Data Plane. Data Plane Functions. Data Plane Protocols. OpenFlow Logical Network Device. Flow Table Structure. Flow Table Pipeline. The Use of Multiple Tables. Group Table. OpenFlow Protocol. SDN Control Plane Architecture. Control Plane Functions. Southbound Interface. Northbound Interface. Routing. ITU-T Model. OpenDaylight.OpenDaylight Architecture. OpenDaylight Helium. SDN Application Plane Architecture. Northbound Interface. Network Services Abstraction Layer. Network Applications. UserInterface.

UNITV NETWORKFUNCTIONSVIRTUALIZATION 9

Motivation-VirtualMachines –NFV benefits-requirements—architecture- NFV Infrastructure - VirtualizedNetworkFunctions-NFVManagementandOrchestration-NFVUseCases-NFV andSDN–Network virtualization —VLANandVPN

TOTAL:45 PERIODS

COURSEOUTCOMES:

CO1:Explainbasicnetworkingconcepts
CO2:Comparedifferentwirelessnetworkingprotocols
CO3:Describethedevelopmentsineachgenerationof mobiledatanetworks CO4: Explain and develop SDN based applications
CO5:Explaintheconceptsofnetworkfunctionvirtualization

SUGGESTEDACTIVITIES:

1. Executevariousnetworkutilitiessuchastracert,pathping,ipconfig
2. ImplementtheSoftwareDefinedNetworkingusingMininet
3. ImplementroutinginMininet
4. Installavirtualmachineandstudynetwork virtualization
5. SimulatevariousnetworktopologiesinNetworkSimulator

REFERENCES

1. JamesBernstein,"NetworkingmadeEasy",2018.(UNITI)

2.HoudaLabiod,CostantinodeSantis,HossamAfifi"Wi-Fi,Bluetooth,ZigbeeandWiMax", Springer2007(UNIT2)

3.ErikDahlman,StefanParkvall,JohanSkold,4G:LTE/LTE-AdvancedforMobile Broadband,AcademicPress,2013(UNIT3)

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SECURE AGRO-FOOD SUPPLY CHAIN TRACEABILITY USING BLOCKCHAIN AND IPFS

A PROJECT REPORT (PHASE II)

Submitted by

RAJESHKUMAR A

731221405010

In partial fulfillment for the award of the degree of

MASTER OF ENGINEERING

in

COMPUTER SCIENCE AND ENGINEERING

JKK MUNIRAJAH COLLEGE OF TECHNOLOGY,

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OCTOBER 2023

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GOBI (Tk), ERODE (Dt).

ANNA UNIVERSITY, CHENNAI

BONAFIDE CERTIFICATE

Certified that this Report titled **"SECURE AGRO-FOOD SUPPLY CHAIN TRACEABILTY USING BLOCKCHAIN AND IPFS"** is the bonafide work of **"RAJESHKUMAR A (731221405010)"** who carried out the project work under my supervision. Certified further that to the best of my knowledge the work reported herein does not form part of any other thesis or dissertation on the basis of which a degree or award was conferred on an earlier occasion on this or any other candidate.

SIGNATURE
HEAD OF THE DEPARTMENT
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Submitted for the Project Viva-voce Examination held on 09-10-2023 (FN)

INTERNAL EXAMINER

EXTERNAL EXAMINER

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GOBI (TK), ERODE (Dt).

ABSTRACT

There is a growing demand for transparency along the agri-food chain, both from customers and governments. The adoption of blockchain technology to enable secure traceability for the management of the agri-food chain, provide information such as the provenance of a food product and prevent food fraud, is emerging rapidly, due to the inherent trust and inalterability provided by this technology. In this project, to propose a new approach to easily customize and compose general Ethereum-based smart contracts designed for the agri-food industrial domain, to be able to reuse the code and modules and automate the process to shorten development times, while keeping it safe and reliable. Starting from the definition of the real production process, to aim automatically generates both the smart contracts to manage the system and the user interfaces to interact with them, thus producing a system that works semi automatically.

CHAPTER I

INTRODUCTION

Blockchain technology is a new distributed, decentralized and immutable ledger database that can assure immutability and integrity of data without the need of a third trusted party. This is one of the reasons for which strong expectations exist on this technology to solve problems in sectors in which several untrusted actors have to work together. such as in the case of the agri-food industry. Blockchain technology appeared for the first time in 2008 when one or more developers under the pseudonym Satoshi Nakamoto published a paper on a P2P electronic cash system [1] based on a digital currency called Bitcoin. This currency is based on a blockchain and does not need any intermediaries or central authority to transfer money from one person to another person. A blockchain is a specific type of distributed database able to store data in a secure and immutable way, and simultaneously to create transparency of the data history. It is based on a technological protocol that enables data to be exchanged with third parties within the P2P network without the need for intermediaries, because participants interact anonymously with encrypted identities, through transactions. Each transaction must be validated by a community of users through a consensus process, and then recorded in the ledger by adding it to an immutable chain of blocks holding the transactions stored in every network node. Many companies and startups are already adopting. and working on blockchain technology, trying to exploit the many advantages it promises. so we are experiencing a strong growth of ideas and applications.

CHAPTER 10

CONCLUSION

10.1 CONCLUSION

Now days, consumers worldwide want to be sure that the food they eat is safe and can be reliably traced back to its point of origin to give assurance that what they are buying is authentic and healthy. For this reason, they are demanding the highest standards of food safety throughout the supply chain and they are willing to pay for the intangible attributes of secure traceability and country of origin labeling. Traceability systems are considered important to ensure the safety of a food product and prevent food fraud in the food supply chain. It is essential to improve the current traceability systems, as unscrupulous producers could exploit the gaps in the systems to their advantage and to the detriment of consumers.

Systems based on blockchain technology and smart contracts, integrated with the Internet of Things, allow to implement a traceability system where the producers can share the responsibility to contribute information to their products, and independent third party can identify themselves and certify the correctness of the data related to products' origin and quality. In this way, the customer can be assured of the truthfulness of the reported information with a high degree of confidence.

In this context, we proposed a system enabling developers to quickly and smoothly develop traceability systems in the agri-food domain, without the need to grasp in every detail the technicalities of SC development, which is clearly different from classical software development. To this purpose, we accurately represented the problem domain, which was found suitable for such an approach, and developed a system able to automatically generate both the SCs and the UI of a tracing system.

Our approach starts from the description of the supply chain to be traced in terms of actors, producers, resources and products, events, and data. This description is given using a set of spreadsheet pages, which is a tool very easy to use also by people expert in the domain, but not in computer science. From these pages, converted to.csv les, the SCs are generated, as well as the HTML5 pages able to interact with them and providing the UI of the dApp.

This methodology can be used at every node of the supply chain and can capture critical

APPENDIX - 3

PUBLICATION PROOF:

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International Journal on Applications in Engineering and Technology

Certificate of Publication

This certificate is awarded to **"Mr. A.Rajeshkumar"** in recognition of publication of the paper entitled **"Secure Agro-Food Supply Chain Traceability using Block Chain And IPFS"** Published in IJAET (International Journal on Applications in Engineering and Technology) Volume 9, Issue 4 , September 2023.

Indexed in Google Scholar, J-Gate.

Publisher/Managing Director

Editor-In Chief

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CP4151 ADVANCED DATA STRUCTURES AND ALGORITHMS LTPC 3003

COURSEOBJECTIVES:

- To understand the usage of algorithms in computing
- To learn and use hierarchical data structures and its operations
- To learn the usage of graphs and its applications
- To select and design data structures and algorithms that is appropriate for problems
- To study about NP Completeness of problems.

UNITI ROLEOFALGORITHMSINCOMPUTING&COMPLEXITY ANALYSIS **9**

Algorithms – Algorithms as a Technology -Time and Space complexity of algorithms-Asymptotic analysis-Average and worst-case analysis-Asymptotic notation-Importance of efficient algorithms- Program performance measurement - Recurrences: The Substitution Method – The Recursion-TreeMethod-Datastructuresandalgorithms.

UNITII HIERARCHICALDATASTRUCTURES **9**

BinarySearchTrees:Basics–QueryingaBinarysearchtree–InsertionandDeletion-Red Black trees: Properties of Red-Black Trees–Rotations–Insertion–Deletion -B-Trees: DefinitionofB-trees–BasicoperationsonB-Trees–DeletingakeyfromaB-Tree-Heap– Heap Implementation – Disjoint Sets - Fibonacci Heaps: structure – Mergeable-heap operations-Decreasing a key and deleting a node-Bounding the maximum degree.

UNITIII GRAPHS **9**

Elementary Graph Algorithms: Representations of Graphs – Breadth-First Search – Depth-First Search–TopologicalSort–Strongly Connected Components- Minimum Spanning Trees: Growing a Minimum Spanning Tree – Kruskal and Prim- Single-Source Shortest Paths: The Bellman-Ford algorithm – Single-Source Shortest paths in Directed Acyclic Graphs – Dijkstra's Algorithm; Dynamic Programming - All-Pairs Shortest Paths: Shortest Paths and Matrix Multiplication – The Floyd-Warshall Algorithm

UNITIV ALGORITHMDESIGNTECHNIQUES **9**

DynamicProgramming:Matrix-ChainMultiplication–ElementsofDynamicProgramming–Longest Common Subsequence- Greedy Algorithms: – Elements of the Greedy Strategy- An Activity-Selection Problem - Huffman Coding.

UNITV NPCOMPLETEANDNP HARD **9**

NP-Completeness:PolynomialTime–Polynomial-TimeVerification–NP-Completenessand Reducibility–NP-CompletenessProofs–NP-CompleteProblems.

TOTAL:45 PERIODS

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SUGGESTEDACTIVITIES:

1. Write an algorithm for Towers of Hanoi problem using recursion and analyze the complexity (No of disc-4)
2. Write any one real time application of hierarchical data structure
3. Write a program to implement Make_Set, Find_Set and Union functions for Disjoint Set Data Structure for a given undirected graph G(V,E) using the linked list representation with simple implementation of Union operation
4. Find the minimum cost to reach last cell of the matrix from its first cell
5. Discuss about any NP completeness problem

COURSEOUTCOMES:

CO1:Design data structures and algorithms to solve computing problems.

CO2: Choose and implement efficient data structures and apply them to solve problems.

CO3: Design algorithms using graph structure and various string-matching algorithms to solve real-life problems.

CO4: Design one's own algorithm for an unknown problem.

CO5: Apply suitable design strategy for problem solving.

REFERENCES

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2.AdamDrozdex,"DataStructuresandalgorithmsinC++",CengageLearning,4th Edition,2013.

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CARDAMOM PLANT DISEASE DETECTION APPROACH USING KNN

PHASE II REPORT

Submitted by

RANJANI R

731221405011

In partial fulfillment for the award of the degree of

MASTER OF ENGINEERING

in

COMPUTER SCIENCE AND ENGINEERING

JKK MUNIRAJAH COLLEGE OF TECHNOLOGY,

T.N. PALAYAM, GOBI-638 506.

ANNA UNIVERSITY: CHENNAI 600025

OCTOBER 2023

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GOBI (Tk), ERODE (Dt).

ANNA UNIVERSITY, CHENNAI

BONAFIDE CERTIFICATE

Certified that this Report titled **"CARDAMOM LEAF DISEASE DETECTION APPROACH USING KNN"** is the bonafide work of **"RANJANI R (731221405011)"** who carried out the project work under my supervision. Certified further that to the best of my knowledge the work reported here in does not form part of any other thesis or dissertation on the basis of which a degree or award was conferred on an earlier occasion on this or any other candidate.

SIGNATURE

HEAD OF THE DEPARTMENT

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Submitted for the Project Viva-voce Examination held on 9/10/23

INTERNAL EXAMINER

EXTERNAL EXAMINER

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ABSTRACT

Identification of the plant disease is the key to preventing the losses in the yield and quantity of the agriculture product. The studies of the plant diseases means the studies of visually observable patterns seen on the plant. Health monitoring and disease detection on plant is very critical for sustainable agriculture. It is very difficult to monitor the plant disease manually. It requires tremendous amount of work, expertise in the plant disease and also require the excessive processing time.Hence,image processing is used for the detection of plant disease. Disease detection involves the steps like image acquisition,image processing. image segmentation,feature extraction and classification.

This paper discussed the methods used for the detection of plant diseases using their leaves images. It also discussed some segmentation and feature extraction algorithm used in the plant disease detection. This is something on which the economy profoundly depends. Infection discovery in plants is a significant job in the agribusiness field, as having disease in plants is very common.To recognize the diseases in leaves,a continuous observation of the plant is required. This observation or continuous monitoring of the plants takes a lot of human effort and it is time consuming too. To make it simply some sort of programmed strategy is required to observe the plants. Program based identification of diseases in plants makes easier to detect the damaged leaves and reduces human efforts and time- saving.

The proposed algorithm distinguishing sickness in plants and classify them more accurately as compared to existing techniques. It is very difficult to monitor the plant disease manually. It requires tremendous amount of work, expertise in the plant diseases. and also require the excessive processing time.Hence,image processing is used for the detection of plant diseases.

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CHAPTER 1

INTRODUCTION

In field of agriculture, detection of disease in plants plays an important role. To detect a plant disease in very initial stage, use of automatic disease detection technique is beneficial. For instance a disease named little leaf disease is a hazardous disease found in pine trees in United States. The affected tree has a stunted growth and dies within 6 years. Its impact is found in Alabama, Georgia parts of Southern US. In such scenarios early detection could have been fruitful.

The existing method for plant disease detection is simply naked eye observation by experts through which identification and detection of plant diseases is done. For doing so,a large team of experts as well as continuous monitoring of plant is required, which costs very high when we do with large farms. At the same time, in some countries, farmers do not have proper facilities or even idea that they can contact to experts. Due to which consulting experts even cost high as well as time consuming too. In such conditions, the suggested technique proves to be beneficial in monitoring large fields of crops. Automatic detection of the diseases by just seeing the symptoms on the plant leaves makes it easier as well as cheaper. This also supports machine vision to provide image based automatic process control, inspection, and robot guidance.

Plant disease identification by visual way is more laborious task and at the same time, less accurate and can be done only in limited areas.Whereas if automatic detection technique is used it will take less efforts, less time and become more accurate. In plants, some general diseases seen are brown and yellow spots, early and late scorch, and others are fungal, viral and bacterial diseases. Image processing is used for measuring affected area of disease and to determine the difference in the color of the affected area .

Image segmentation is the process of separating or grouping an image into different parts. There are currently many different ways of performing image segmentation, ranging from the simple thresholding method to advanced color image segmentation methods. These parts normally correspond to something that humans can easily separate and view as individual objects.

CHAPTER 9

CONCLUSION

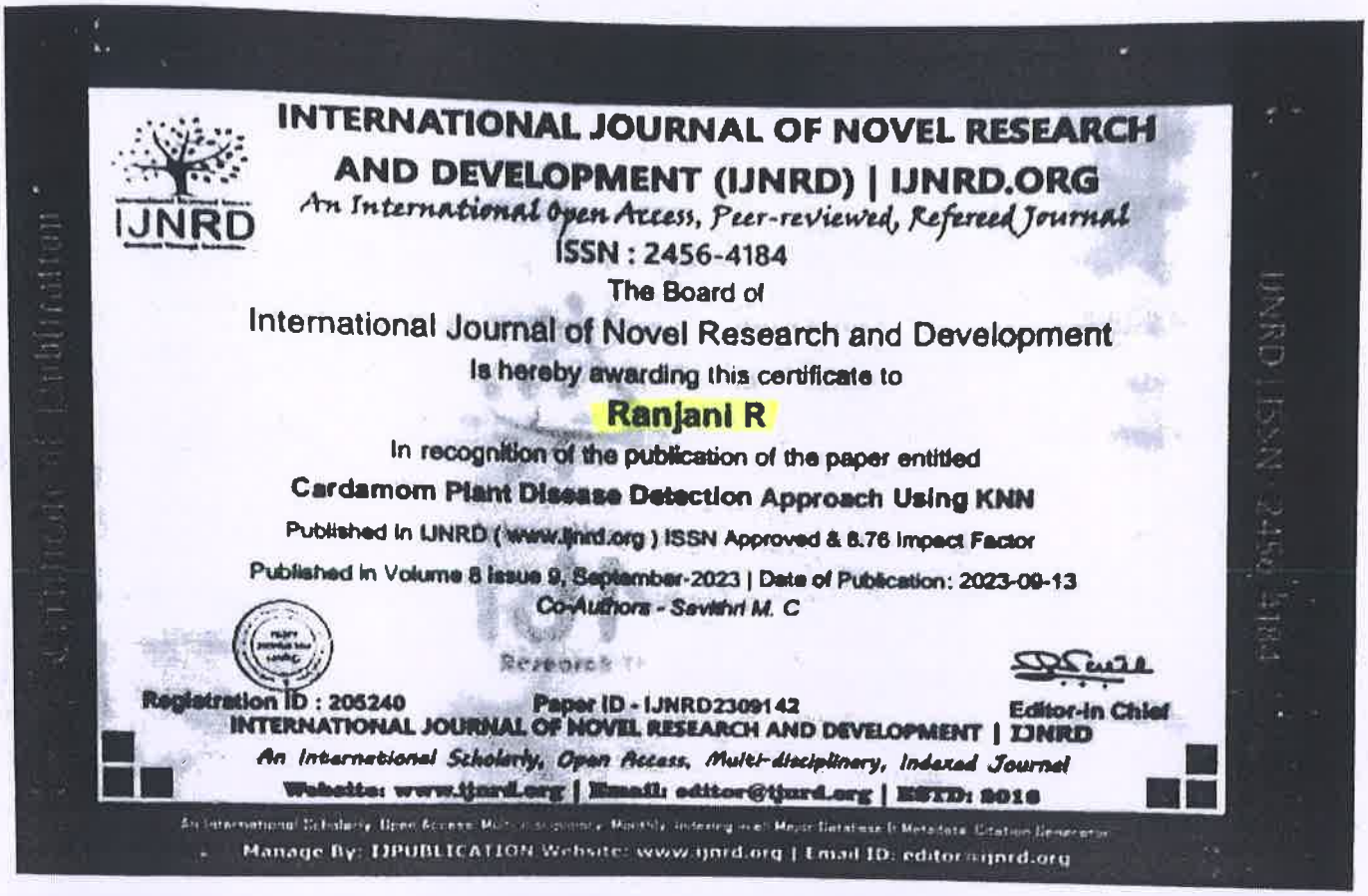
9.1 CONCLUSION

There are number of ways by which we can detect disease of plants and suggest remedies for them. Each has some pros as well as limitations .On one hand visual Analysis is least expensive and simple method, it is not as efficient and reliable. Image processing is a technique which is most spoken for very high accuracy and least time consumption are major advantages offered. The applications of K-means clustering and Neural Networks (NNs) have been formulated for clustering and classification of diseases that effect on plant leaves.

Recognizing the disease accurately and efficiently is mainly the purpose of the proposed approach. The experimental results indicate that the proposed approach is a valuable approach, which can significantly support an accurate detection of leaf diseases in a little computational effort. Along side the supply of cultivation tools, the farmers also need access to accurate information that they can use for efficient crop management and there is no better way than providing them a service that they can use through the software. Mobile application can be developed which is handy and easy to use.An extension of this work will focus on automatically estimating the severity of the detected disease.As future enhancement of the project is to develop the open multimedia (Audio/Video) about the diseases and their solution automatically once the disease is detected.

APPENDIX-3

Paper Publication Proof



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A BLOCKCHAIN APPROACH TO ENSURING PROVENANCE TO OUTSOURCED CLOUD DATA IN A SHARING ECOSYSTEM

PROJECT PHASE II REPORT

Submitted by

SURESHKUMAR P

731221405014

In partial fulfillment for the award of the degree of

MASTER OF ENGINEERING

in

COMPUTER SCIENCE AND ENGINEERING

JKK MUNIRAJAH COLLEGE OF TECHNOLOGY,

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OCTOBER 2023

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T.N. PALAYAM (Po)-638 506.
GOBI (Tk), ERODE (Dt).

ANNA UNIVERSITY, CHENNAI

BONAFIDE CERTIFICATE

Certified that this Report titled **"A BLOCKCHAIN APPROACH TO ENSURING PROVENANCE TO OUTSOURCED CLOUD DATA IN A SHARING ECOSYSTEM"** is the bonafide work of **"SURESHKUMAR P (731221405014)"** who carried out the project work undermy supervision. Certified further that to the best of my knowledge, the work reported hereindoes not form part of any other thesis or dissertation on the basis of which a degree or awardwas conferred on an earlier occasion on this or any other candidate.

SIGNATURE
HEAD OF THE DEPARTMENT
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SUPERVISOR
Dr.N.SATHYABALAJI., M.E., Ph.D
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Submitted for the Project Viva-voce Examination held on. 09.10.2023

INTERNAL EXAMINER

EXTERNAL EXAMINER

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T.N. PALAYAM (Po)-638 506.
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Abstract

The proliferation of cloud-based services for data storage and sharing has brought to the forefront concerns regarding data provenance, security, and integrity. In response, we present an innovative blockchain-based solution tailored to ensure data provenance in decentralized sharing ecosystems. Leveraging the immutability and transparency inherent in blockchain technology, our approach establishes an incorruptible ledger of data transactions, thereby bolstering data integrity and security. Smart contracts play a pivotal role, automating data sharing agreements and enforcing access control protocols, fostering trust and accountability among participants. Empirical findings underscore the effectiveness of our approach in maintaining data provenance and transparency, making it a viable choice for real-world cloud data sharing scenarios. Here, we showcase the use of Solana, a high-performance blockchain platform, to facilitate data provenance tracking, ensuring high throughput, low latency, and scalability. This article delves into system architecture, smart contract development, data sharing processes, and the role of Solana's consensus mechanism in upholding data integrity and transparency, offering a comprehensive solution to the challenges of modern data sharing ecosystems.

CHAPTER I
INTRODUCTION

The advent of cloud computing has revolutionized the landscape of data storage and sharing, offering unprecedented scalability and accessibility to individuals and organizations alike. However, the convenience of cloud-based data sharing is accompanied by inherent challenges, particularly in the domain of data provenance – the ability to trace and ensure the authenticity and integrity of data as it traverses various stages within cloud ecosystems. As data becomes increasingly outsourced to cloud service providers, concerns related to data handling, security, and the potential for unauthorized access have gained prominence. Data provenance, in the context of cloud computing, plays a pivotal role in safeguarding data integrity, enforcing security protocols, facilitating compliance, and ensuring comprehensive auditability within cloud systems.

In this digital age, data has become a valuable asset, and its security and traceability are paramount. When data is entrusted to third-party cloud providers, the need for a robust mechanism to guarantee its provenance becomes essential. Data provenance ensures that data can be traced back to its origins, providing insights into how it has been processed, modified, and accessed. It serves as a crucial element in maintaining trust and accountability in cloud environments, especially in scenarios involving sensitive or critical data.

This research endeavors to propose a robust blockchain-based solution tailored to address the multifaceted challenges associated with ensuring data provenance in decentralized cloud data-sharing environments. Leveraging the principles of blockchain technology, which is known for its transparency, immutability, and decentralization, this research aims to achieve the following objectives:

1. Implement a blockchain network to maintain an immutable and transparent

CHAPTER X

CONCLUSION AND FUTURE WORK

CONCLUSION

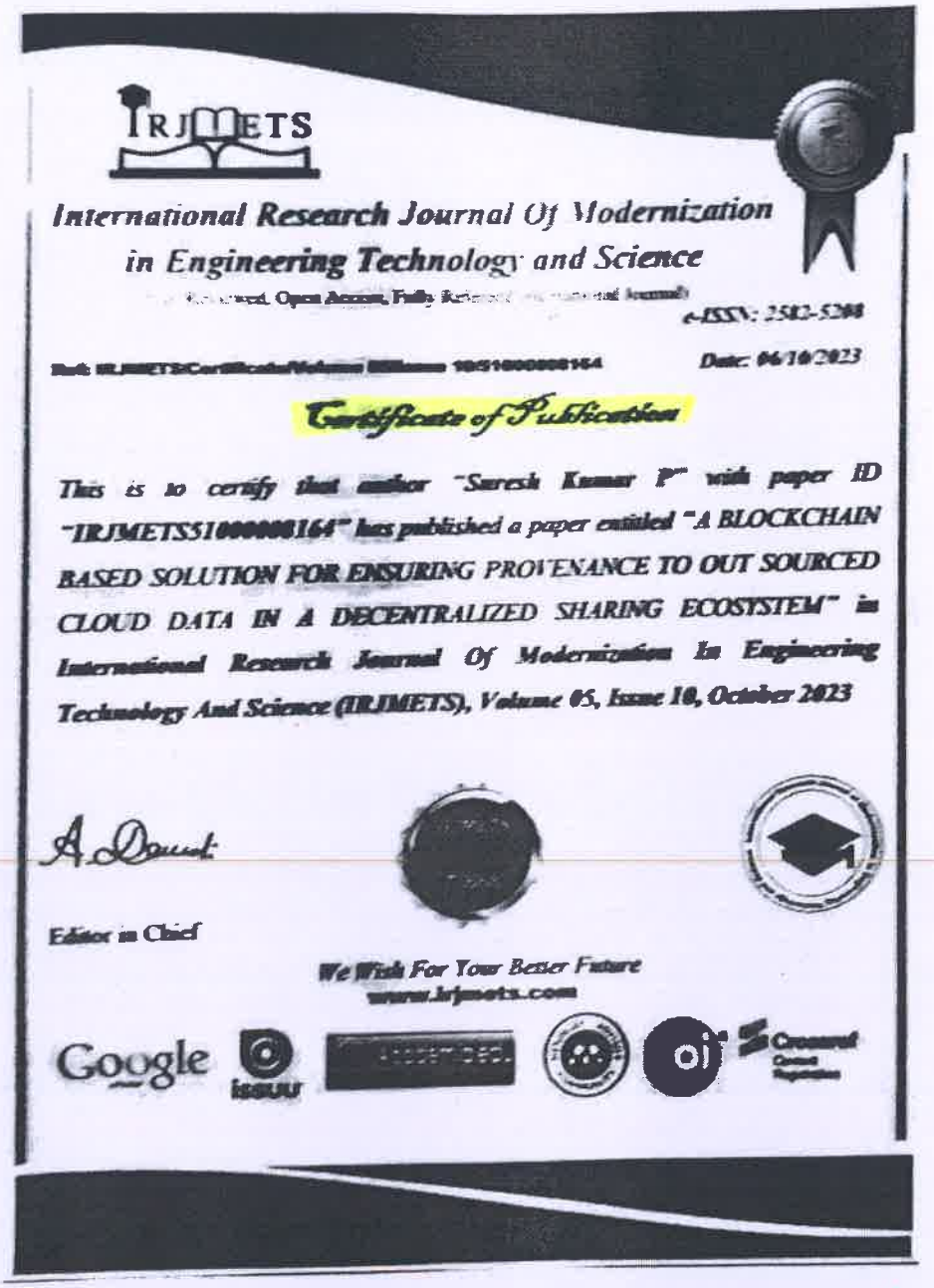
The proposed blockchain approach utilizing Solana presents a robust solution for ensuring data provenance to outsourced cloud data in decentralized sharing ecosystems. The use of Solana's high-performance blockchain platform, combined with smart contracts, ensures high throughput, low latency, and scalability, making it suitable for real-time data provenance tracking. This approach offers transparency, immutability, and data integrity, providing users with a verifiable record of data ownership, modifications, and transfers. As blockchain technology continues to evolve, the proposed approach showcases its potential to revolutionize data provenance in decentralized ecosystems.

FUTURE WORK

Future work includes investigating scalability improvements, exploring interoperability with other blockchain networks, and enhancing privacy protection mechanisms.

APPENDIX-III

PUBLICATION PROOF



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Accredited by NAAC with "A" grade

T.N. Palayam (Po), Gobi (Tk), Erode (Dt) – 638 506

INTERNSHIP DETAILS 2022-23

SI.NO	REGISTER NUMBER	STUDENT NAME	NAME OF THE COMPANY	LOCATION	DATE
1	731221405001	ARUNKUMAR R	KAASHIV INFOTECH	CHENNAI	07.08.2023 to 12.08.2023
2	731221405002	CHARLY S			
3	731221405005	GAYATHRI S			
4	731221405006	INDHIRAN R			
5	731221405007	LOGARAJA S			
6	731221405008	NAVEEN S			
7	731221405009	PONMANI A			
8	731221405010	RAJESH KUMAR A			
9	731221405011	RANJANI R			
10	731221405014	SURESHKUMAR P			

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T.N. PALAYAM (Po)-638 506,
GOBI (Tk), ERODE (Dt).

Gmail

Internship
1message

MON 31 Jul 2023 at 2.00pm

From: HODCSE<hodcse@jkkmct.edu.in>

Date: MON 31 Jul2023 at 2.00pm

Subject: Internship-reg

To: KAASHIV INFOTECH <kaashiv.info@gmail.com >

Dear Sir,

I am requesting to be joining your **KAASHIV INFOTECH**. The requirements are exactly what I have prepared for and hoped to do. I feel confident that I can make a significant contribution to your organization while at the same time learning from your staff.

Additionally, I shall complete all insurance forms for the new intern orientation. I look forward to working with you and your fine team. I appreciate your confidence in me and providing the chance to work with and observe your outstanding staff.

Refer the following students: **ARUNKUMAR R, CHARLY S, GAYATHRI S, INDHIRAN R, LOGARAJA S, NAVEEN S, PONMANI A, RAJESH KUMAR A, RANJANI R, SURESHKUMAR P**

Sincerely,

Second Year M.E CSE Student,
J K K Munirajah College of Technology,
T.N.Palayam, Erode-638506, Tamilnadu.

PRINCIPAL
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T.N. PALAYAM (Po)-638 506.
GOBI (Tk), ERODE (Dt).

Gmail

Internship
1message

THUR 03 Aug 2023 at 3.30pm

From: KAASHIV INFOTECH <kaashiv.info@gmail.com >

Date: THUR 03 Aug 2023 at 3.30pm

Subject: Internship-reg

To: HODCSE<hodcse@jkkmct.edu.in>

Dear SIR,

I am writing to confirm my acceptance of your internship offer of 07.08.2023 to 12.08.2023 and to tell you how to be joining my **KAASHIV INFOTECH**. The requirements are exactly what I have prepared for and hoped to do. I feel confident that I can make a significant contribution to your organization while at the same time learning from my staff.

As we discussed, I will report at 8:00 a.m. on AUG 05, 2023 and will be ready to take on my first assignment as an intern from my company. Additionally, I shall complete all insurance forms for the new intern orientation. I look forward to working with you and your fine team. I appreciate your confidence in me and providing the chance to work with and observe my outstanding staff.

Refer the following students: **ARUNKUMAR R, CHARLY S, GAYATHRI S, INDHIRAN R, LOGARAJA S, NAVEEN S, PONMANI A, RAJESH KUMAR A, RANJANI R, SURESHKUMAR P**

Sincerely,

HR Manager,
KAASHIV INFOTECH,
Chennai.

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INTERNSHIP

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TO WHOMSOEVER IT MAY CONCERN

This is to certify that **Ms.RANJANI R**, studying **ME.Computer Science and Engineering** in **J.K.K.MUNIRAJAH COLLEGE OF TECHNOLOGY** has successfully completed Internship Program from **07.08.2023** to **12.08.2023** at **Kaashiv info tech**, Chennai

During the Internship, her Performance was good.

Manager

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This is to certify that **Mr.RAJESH KUMAR A**, studying **ME.Computer Science and Engineering** in **J.K.K.MUNIRAJAH COLLEGE OF TECHNOLOGY** has successfully completed Internship Program from **07.08.2023** to **12.08.2023** at **Kaashiv info tech**, Chennai

During the Internship, her Performance was good.

Manager

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This is to certify that **Ms.PONMANI A**, studying **ME.Computer Science and Engineering** in **J.K.K.MUNIRAJAH COLLEGE OF TECHNOLOGY** has successfully completed Internship Program from **07.08.2023** to **12.08.2023** at **Kaashiv info tech**, Chennai

During the Internship, her Performance was good.

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GOBI (TK), ERODE (Dt).

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This is to certify that **Mr.NAVEEN S**, studying **ME.Computer Science and Engineering** in **J.K.K.MUNIRAJAH COLLEGE OF TECHNOLOGY** has successfully completed Internship Program from **07.08.2023** to **12.08.2023** at **Kaashiv info tech**, Chennai

During the Internship, her Performance was good.

Manager

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OF TECHNOLOGY
T.N. PALAYAM (Po)-6[illegible]
GOBI (TK), ERODE (DT)

KaaShiv InfoTech

TO WHOMSOEVER IT MAY CONCERN

This is to certify that **Mr.LOGARAJA S**, studying **ME.Computer Science and Engineering** in **J.K.K.MUNIRAJAH COLLEGE OF TECHNOLOGY** has successfully completed Internship Program from **07.08.2023** to **12.08.2023** at **Kaashiv info tech**, Chennai

During the Internship, her Performance was good.

Manager

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GOBI (Tk). ERODE (Dt).

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TO WHOMSOEVER IT MAY CONCERN

This is to certify that **Mr.INDHIRAN R**, studying **ME.Computer Science and Engineering** in **J.K.K.MUNIRAJAH COLLEGE OF TECHNOLOGY** has successfully completed Internship Program from **07.08.2023** to **12.08.2023** at **Kaashiv info tech**, Chennai

During the Internship, her Performance was good.

Manager

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GOBI (TK), ERODE (DT)

KaaShiv InfoTech

TO WHOMSOEVER IT MAY CONCERN

This is to certify that **Ms.GAYATHRI S**, studying **ME.Computer Science and Engineering** in **J.K.K.MUNIRAJAH COLLEGE OF TECHNOLOGY** has successfully completed Internship Program from **07.08.2023** to **12.08.2023** at **Kaashiv info tech**, Chennai

During the Internship, her Performance was good.

Manager

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GOBI (Tk), ERODE (Dt).

KaaShiv InfoTech

TO WHOMSOEVER IT MAY CONCERN

This is to certify that **Mr.CHARLY S**, studying **ME.Computer Science and Engineering** in **J.K.K.MUNIRAJAH COLLEGE OF TECHNOLOGY** has successfully completed Internship Program from **07.08.2023** to **12.08.2023** at **Kaashiv info tech**, Chennai

During the Internship, her Performance was good.

Manager

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JKK MUNIRAJAH COLLEGE
OF TECHNOLOGY
T.N. PALAYAM (Po)-638 506
GOBI (Tk), ERODE (Dt).

KaaShiv InfoTech

TO WHOMSOEVER IT MAY CONCERN

This is to certify that **Mr.SURESHKUMAR P**, studying **ME.Computer Science and Engineering** in **J.K.K.MUNIRAJAH COLLEGE OF TECHNOLOGY** has successfully completed Internship Program from **07.08.2023** to **12.08.2023** at **Kaashiv info tech**, Chennai

During the Internship, her Performance was good.

Manager

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OF TECHNOLOGY
...UAYAM (Po)-638 506.
...(TK), ERODE (Dt).

KaaShiv InfoTech

TO WHOMSOEVER IT MAY CONCERN

This is to certify that **Mr.ARUNKUMAR R**, studying **ME.Computer Science and Engineering** in **J.K.K.MUNIRAJAH COLLEGE OF TECHNOLOGY** has successfully completed Internship Program from **07.08.2023** to **12.08.2023** at **Kaashiv info tech**, Chennai

During the Internship, her Performance was good.

Manager

PRINCIPAL
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GOBI (Tk), ERODE (Dt).

J.K.K. MUNIRAJAH COLLEGE OF TECHNOLOGY

Approved by AICTE, New Delhi And Affiliated to Anna University, Chennai.

Accredited by NAAC with "A" grade

T.N. Palayam (Po), Gobi (Tk), Erode (Dt) – 638 506

INTERNSHIP DETAILS 2022-23

SI.NO	REGISTER NUMBER	STUDENT NAME	NAME OF THE COMPANY	LOCATION	DATE
1	731222405001	KIRUTHIKA S	TOPBEAN TECHNOLOGIES	CHENNAI	21.08.2023 to 26.08.2023
2	731222405002	THAMARAISELVI R			

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OF TECHNOLOGY
T.N. PALAYAM (Po)-638 506.
GOBI (Tk). ERODE (Dt).

Gmail

Internship
1message

MON 14 Aug 2023 at 2.00pm

From: HODCSE<hodcse@jkkmct.edu.in>

Date: MON 14 Aug 2023 at 2.00pm

Subject: Internship-reg

To: TOPBEAN TECHNOLOGIES <hr.topbeaninfo@gmail.com >

Dear Sir,

I am requesting to be joining your **TOPBEAN TECHNOLOGIES**. The requirements are exactly what I have prepared for and hoped to do. I feel confident that I can make a significant contribution to your organization while at the same time learning from your staff.

Additionally, I shall complete all insurance forms for the new intern orientation. I look forward to working with you and your fine team. I appreciate your confidence in me and providing the chance to work with and observe your outstanding staff.

Refer the following students: **KIRUTHIKA S, THAMARAISELVI R**

Sincerely,

First Year M.E CSE Student,
J K K Munirajah College of Technology,
T.N.Palayam, Erode-638506, Tamilnadu.

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JKK MUNIRAJAH COLLEGE
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GOBI (Tk), ERODE (Dt).

Gmail

Internship
1message

THUR 17 Aug 2023 at 3.30pm

From: TOPBEAN TECHNOLOGIES <hr.topbeaninfo@gmail.com >

Date: THUR 17 Aug 2023 at 3.30pm

Subject: Internship-reg

To: HODCSE<hodcse@jkkmct.edu.in>

Dear SIR,

I am writing to confirm my acceptance of your internship offer of 21.08.2023 to 26.08.2023 and to tell you how to be joining my **TOPBEAN TECHNOLOGIES**. The requirements are exactly what I have prepared for and hoped to do. I feel confident that I can make a significant contribution to your organization while at the same time learning from my staff.

As we discussed, I will report at 8:00 a.m. on AUG 19, 2023 and will be ready to take on my first assignment as an intern from my company. Additionally, I shall complete all insurance forms for the new intern orientation. I look forward to working with you and your fine team. I appreciate your confidence in me and providing the chance to work with and observe my outstanding staff.

Refer the following students: **KIRUTHIKA S, THAMARAISELVI R**

Sincerely,

HR Manager,
TOPBEAN TECHNOLOGIES,
Coimbatore.

PRINCIPAL
JKK MUNIRAJAH COLLEGE
OF TECHNOLOGY
T.N. PALAYAM (Po)-638 506.
GOBI (Tk), ERODE (Dt).

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This is to certify that **Ms.THAMARAISELVI R**, studying **ME.Computer Science and Engineering** in **JKK Munirajah College of Technology** has/have successfully completed the internship program from **23.01.2023** to **28.01.2023** at topbean technologies, Coimbatore.

During the internship, His/Her performance was good.

Manager

28.01.2023

Date

PRINCIPAL
JKK MUNIRAJAH COLLEGE
OF TECHNOLOGY
T.N. 506.
GOBI (Tk). ERODE (Dt).

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THE EXPERT TEAM

TO WHOMSOEVER IT MAY CONCERN

This is to certify that **Ms.KIRUTHIKA S**, studying **ME.Computer Science and Engineering** in **JKK Munirajah College of Technology** has/have successfully completed the internship program from **23.01.2023** to **28.01.2023** at topbean technologies, Coimbatore.

During the internship, His/Her performance was good.

Manager

28.01.2023

Date

PRINCIPAL
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