



**MOHAMED SATHAK A J COLLEGE OF ENGINEERING**  
Sponsored by Mohamed Sathak Trust  
(Approved by AICTE, New Delhi and Affiliated to Anna University, Chennai)  
Siruseri IT Park, Egattur, Chennai 603 103

**B.TECH - INFORMATION TECHNOLOGY**

S.NO	Name of the course that include experiential learning through Project work/ Internship
1	CS8091 - Big Data Analytics
2	CS8791 - Cloud Computing
3	CS8351 - Digital Principles and System Design
4	CS6707- Cryptography and Network Security
5	CS8079- Human Computer Interaction
6	GE8151- Problem Solving and Python Programming
7	IT 8602- Mobile Communication
8	CS8451- Design and Analysis of Algorithms
9	IT 8501- Web Technology
10	IT 8076- Software Testing
11	IT 8073- Information Security
12	CS8792- Cryptography and Network Security
13	CS 8591- Computer Networks



  
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S.No.	Subject Code	Subject Name	Name of the Content that include experiential learning through project work
1	CS8091	BIG DATA ANALYTICS	<ul style="list-style-type: none"><li>• Decision Tree Algorithms.</li><li>• Naïve Bayes.</li><li>• Bayes' Theorem.</li><li>• Apriori Algorithm.</li><li>• Real Time Analytics Platform (RTAP) Applications.</li><li>• Case Studies.</li><li>• Tabular Stores.</li></ul>

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CS8091

**BIG DATA ANALYTICS**

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**OBJECTIVES:**

- To know the fundamental concepts of big data and analytics.
- To explore tools and practices for working with big data
- To learn about stream computing.
- To know about the research that requires the integration of large amounts of data.

**UNIT I INTRODUCTION TO BIG DATA**

9

Evolution of Big data - Best Practices for Big data Analytics - Big data characteristics - Validating - The Promotion of the Value of Big Data - Big Data Use Cases- Characteristics of Big Data Applications - Perception and Quantification of Value -Understanding Big Data Storage - A General Overview of High-Performance Architecture - HDFS - MapReduce and YARN - Map Reduce Programming Model

**UNIT II CLUSTERING AND CLASSIFICATION**

9

Advanced Analytical Theory and Methods: Overview of Clustering - K-means - Use Cases - Overview of the Method - Determining the Number of Clusters - Diagnostics - Reasons to Choose and Cautions - Classification: Decision Trees - Overview of a Decision Tree - The General Algorithm - Decision Tree Algorithms - Evaluating a Decision Tree - Decision Trees in R - Naïve Bayes - Bayes' Theorem - Naïve Bayes Classifier.

**UNIT III ASSOCIATION AND RECOMMENDATION SYSTEM**

9

Advanced Analytical Theory and Methods: Association Rules - Overview - Apriori Algorithm - Evaluation of Candidate Rules - Applications of Association Rules - Finding Association & finding similarity - Recommendation System: Collaborative Recommendation- Content Based Recommendation - Knowledge Based Recommendation- Hybrid Recommendation Approaches.

**UNIT IV STREAM MEMORY**

9

Introduction to Streams Concepts – Stream Data Model and Architecture - Stream Computing, Sampling Data in a Stream – Filtering Streams – Counting Distinct Elements in a Stream – Estimating moments – Counting oneness in a Window – Decaying Window – Real time Analytics Platform(RTAP) applications - Case Studies - Real Time Sentiment Analysis, Stock Market Predictions. Using Graph Analytics for Big Data: Graph Analytics

**UNIT V NOSQL DATA MANAGEMENT FOR BIG DATA AND VISUALIZATION**

9

NoSQL Databases : Schema-less Models: Increasing Flexibility for Data Manipulation-Key Value Stores- Document Stores - Tabular Stores - Object Data Stores - Graph Databases Hive - Sharding – Hbase – Analyzing big data with twitter - Big data for E-Commerce Big data for blogs - Review of Basic Data Analytic Methods using R.

**TOTAL: 45 PERIODS**

**OUTCOMES:**

**Upon completion of the course, the students will be able to:**

- Work with big data tools and its analysis techniques
- Analyze data by utilizing clustering and classification algorithms
- Learn and apply different mining algorithms and recommendation systems for large volumes of data
- Perform analytics on data streams
- Learn NoSQL databases and management.





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S.No.	Subject Code	Subject Name	Name of the Content that include experiential learning through project work
2	CS8791	CLOUD COMPUTING	<ul style="list-style-type: none"><li>• Virtualization of CPU</li><li>• Memory</li><li>• I/O Devices</li><li>• Public, Private and Hybrid Clouds</li><li>• Cloud Security Challenges</li><li>• Hadoop</li><li>• MapReduce</li></ul>

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**OBJECTIVES:**

- To understand the concept of cloud computing.
- To appreciate the evolution of cloud from the existing technologies.
- To have knowledge on the various issues in cloud computing.
- To be familiar with the lead players in cloud.
- To appreciate the emergence of cloud as the next generation computing paradigm.

**UNIT I INTRODUCTION**

9

Introduction to Cloud Computing – Definition of Cloud – Evolution of Cloud Computing – Underlying Principles of Parallel and Distributed Computing – Cloud Characteristics – Elasticity in Cloud – On-demand Provisioning.

**UNIT II CLOUD ENABLING TECHNOLOGIES**

10

Service Oriented Architecture – REST and Systems of Systems – Web Services – Publish-Subscribe Model – Basics of Virtualization – Types of Virtualization – Implementation Levels of Virtualization – Virtualization Structures – Tools and Mechanisms – Virtualization of CPU – Memory – I/O Devices – Virtualization Support and Disaster Recovery.

**UNIT III CLOUD ARCHITECTURE, SERVICES AND STORAGE**

8

Layered Cloud Architecture Design – NIST Cloud Computing Reference Architecture – Public, Private and Hybrid Clouds - IaaS – PaaS – SaaS – Architectural Design Challenges – Cloud Storage – Storage-as-a-Service – Advantages of Cloud Storage – Cloud Storage Providers – S3.

**UNIT IV RESOURCE MANAGEMENT AND SECURITY IN CLOUD**

10

Inter Cloud Resource Management – Resource Provisioning and Resource Provisioning Methods – Global Exchange of Cloud Resources – Security Overview – Cloud Security Challenges – Software-as-a-Service Security – Security Governance – Virtual Machine Security – IAM – Security Standards.

**UNIT V CLOUD TECHNOLOGIES AND ADVANCEMENTS**

8

Hadoop – MapReduce – Virtual Box – Google App Engine – Programming Environment for Google App Engine – Open Stack – Federation in the Cloud – Four Levels of Federation – Federated Services and Applications – Future of Federation.

**TOTAL: 45 PERIODS****OUTCOMES:**

**On Completion of the course, the students should be able to:**

- Articulate the main concepts, key technologies, strengths and limitations of cloud computing.
- Learn the key and enabling technologies that help in the development of cloud.
- Develop the ability to understand and use the architecture of compute and storage cloud, service and delivery models.
- Explain the core issues of cloud computing such as resource management and security.
- Be able to install and use current cloud technologies.
- Evaluate and choose the appropriate technologies, algorithms and approaches for implementation and use of cloud.

**TEXT BOOKS:**

1. Kai Hwang, Geoffrey C. Fox, Jack G. Dongarra, "Distributed and Cloud Computing, From Parallel Processing to the Internet of Things", Morgan Kaufmann Publishers, 2012.
2. Rittinghouse, John W., and James F. Ransome, -Cloud Computing: Implementation, Management and Securityll, CRC Press, 2017.





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S.No.	Subject Code	Subject Name	Name of the Content that include experiential learning through project work
3	CS8351	DIGITAL PRINCIPLES AND SYSTEM DESIGN	<ul style="list-style-type: none"><li>• Boolean Algebra and Logic Gates</li><li>• Analysis and Design Procedures</li><li>• Sequential Circuits</li><li>• Analysis and Design of Asynchronous Sequential Circuits</li><li>• RAM</li></ul>

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S.No.	Subject Code	Subject Name	Name of the Content that include experiential learning through project work
5	CS8079	HUMAN COMPUTER INTERACTION	<ul style="list-style-type: none"><li>• Ergonomics</li><li>• styles</li><li>• HCI in software process</li><li>• Hypertext, Multimedia and WWW.</li><li>• Mobile Ecosystem</li><li>• Drag &amp; Drop, Direct Selection</li></ul>

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**OBJECTIVES:**

- To learn the foundations of Human Computer Interaction.
- To become familiar with the design technologies for individuals and persons with disabilities.
- To be aware of mobile HCI.
- To learn the guidelines for user interface.

**UNIT I FOUNDATIONS OF HCI**

9

**The Human:** I/O channels – Memory – Reasoning and problem solving; **The Computer:** Devices – Memory – processing and networks; **Interaction:** Models – frameworks – Ergonomics – styles – elements – interactivity- Paradigms. - **Case Studies**

**UNIT II DESIGN & SOFTWARE PROCESS**

9

**Interactive Design:** Basics – process – scenarios – navigation – screen design – Iteration and prototyping. **HCI in software process:** Software life cycle – usability engineering – Prototyping in practice – design rationale. **Design rules:** principles, standards, guidelines, rules. **Evaluation Techniques – Universal Design**

**UNIT III MODELS AND THEORIES**

9

**HCI Models:** Cognitive models: Socio-Organizational issues and stakeholder requirements – Communication and collaboration models-**Hypertext, Multimedia and WWW.**

**UNIT IV MOBILE HCI**

9

**Mobile Ecosystem:** Platforms, Application frameworks- **Types of Mobile Applications:** Widgets, Applications, Games- Mobile Information Architecture, Mobile 2.0, **Mobile Design:** Elements of Mobile Design, Tools. - **Case Studies**

**UNIT V WEB INTERFACE DESIGN**

9

**Designing Web Interfaces – Drag & Drop, Direct Selection, Contextual Tools, Overlays, Inlays and Virtual Pages, Process Flow - Case Studies**

**TOTAL: 45 PERIODS****OUTCOMES:**

Upon completion of the course, the students should be able to:

- Design effective dialog for HCI
- Design effective HCI for individuals and persons with disabilities.
- Assess the importance of user feedback.
- Explain the HCI implications for designing multimedia/ ecommerce/ e-learning Web sites.
- Develop meaningful user interface.

**TEXT BOOKS:**

1. Alan Dix, Janet Finlay, Gregory Abowd, Russell Beale, -Human Computer Interaction, 3rd Edition, Pearson Education, 2004 (UNIT I, II & III)
2. Brian Fling, -Mobile Design and Development, First Edition, O'Reilly Media Inc., 2009 (UNIT – IV)
3. Bill Scott and Theresa Neil, -Designing Web Interfaces, First Edition, O'Reilly, 2009. (UNIT-V)





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S.No.	Subject Code	Subject Name	Name of the Content that include experiential learning through project work
6	GE8151	PROBLEM SOLVING AND PYTHON PROGRAMMING	<ul style="list-style-type: none"><li>• Guess an Integer number in a range, Towers of Hanoi</li><li>• Linear search, Binary Search</li><li>• Insertion sort, Merge sort</li></ul>

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**OBJECTIVES:**

- To know the basics of algorithmic problem solving
- To read and write simple Python programs.
- To develop Python programs with conditionals and loops.
- To define Python functions and call them.
- To use Python data structures — lists, tuples, dictionaries.
- To do input/output with files in Python.

**UNIT I ALGORITHMIC PROBLEM SOLVING**

9

Algorithms, building blocks of algorithms (statements, state, control flow, functions), notation (pseudo code, flow chart, programming language), algorithmic problem solving, simple strategies for developing algorithms (iteration, recursion). Illustrative problems: find minimum in a list, insert a card in a list of sorted cards, guess an integer number in a range, Towers of Hanoi.

**UNIT II DATA, EXPRESSIONS, STATEMENTS**

9

Python interpreter and interactive mode; values and types: int, float, boolean, string, and list; variables, expressions, statements, tuple assignment, precedence of operators, comments; modules and functions, function definition and use, flow of execution, parameters and arguments; Illustrative programs: exchange the values of two variables, circulate the values of n variables, distance between two points.

**UNIT III CONTROL FLOW, FUNCTIONS**

9

Conditionals: Boolean values and operators, conditional (if), alternative (if-else), chained conditional (if-elif-else); Iteration: state, while, for, break, continue, pass; Fruitful functions: return values, parameters, local and global scope, function composition, recursion; Strings: string slices, immutability, string functions and methods, string module; Lists as arrays. Illustrative programs: square root, gcd, exponentiation, sum an array of numbers, linear search, binary search.

**UNIT IV LISTS, TUPLES, DICTIONARIES**

9

Lists: list operations, list slices, list methods, list loop, mutability, aliasing, cloning lists, list parameters; Tuples: tuple assignment, tuple as return value; Dictionaries: operations and methods; advanced list processing - list comprehension; Illustrative programs: selection sort, insertion sort, mergesort, histogram.

**UNIT V FILES, MODULES, PACKAGES**

9

Files and exception: text files, reading and writing files, format operator; command line arguments, errors and exceptions, handling exceptions, modules, packages; Illustrative programs: word count, copy file.

**OUTCOMES:**

Upon completion of the course, students will be able to

- Develop algorithmic solutions to simple computational problems
- Read, write, execute by hand simple Python programs.
- Structure simple Python programs for solving problems.
- Decompose a Python program into functions.
- Represent compound data using Python lists, tuples, dictionaries.
- Read and write data from/to files in Python Programs.

TOTAL : 45 PERIODS

**TEXT BOOKS:**

1. Allen B. Downey, "Think Python: How to Think Like a Computer Scientist", 2<sup>nd</sup> edition, Updated for Python 3, Shroff/O'Reilly Publishers, 2016 (<http://greenteapress.com/wp/think->





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S.No.	Subject Code	Subject Name	Name of the Content that include experiential learning through project work
7	IT8602	MOBILE COMMUNICATION	<ul style="list-style-type: none"><li>• MAC Protocols</li><li>• IEEE 802.11 Standard</li><li>• DHCP</li><li>• MANET VS VANET</li><li>• WAP</li><li>• Architecture</li></ul>

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**OBJECTIVES:**

The student should be made to:

- Understand the basic concepts of mobile computing
- Understand Wireless LAN, Bluetooth and WiFi Technologies
- Be familiar with the network protocol stack
- Learn the basics of mobile telecommunication system
- Be exposed to Ad-Hoc networks

**UNIT I INTRODUCTION**

9

Introduction to Mobile Computing – Applications of Mobile Computing- Generations of Mobile Communication Technologies-MAC Protocols – SDMA- TDMA- FDMA- CDMA

**UNIT II MOBILE TELECOMMUNICATION SYSTEM**

9

GSM – Architecture – Protocols – Connection Establishment – Frequency Allocation – Routing – Mobility Management – Security –GPRS- UMTS- Architecture

**UNIT III WIRELESS NETWORKS**

9

Wireless LANs and PANs – IEEE 802.11 Standard – Architecture – Services – Blue Tooth- Wi-Fi – WiMAX

**UNIT IV MOBILE NETWORK LAYER**

9

Mobile IP – DHCP – AdHoc– Proactive and Reactive Routing Protocols – Multicast Routing- Vehicular Ad Hoc networks ( VANET) –MANET Vs VANET – Security

**UNIT V MOBILE TRANSPORT AND APPLICATION LAYER**

9

Mobile TCP– WAP – Architecture – WDP – WTLS – WTP –WSP – WAE – WTA Architecture – WML

**TOTAL:45 PERIODS****OUTCOMES:**

At the end of the course, the student should be able to:

- Explain the basics of mobile telecommunication system
- Illustrate the generations of telecommunication systems in wireless network
- Understand the architecture of Wireless LAN technologies
- Determine the functionality of network layer and Identify a routing protocol for a given Ad hoc networks
- Explain the functionality of Transport and Application layer

**TEXT BOOKS:**

1. Jochen Schiller, -Mobile CommunicationsI, PHI, Second Edition, 2003.
2. Prasant Kumar Pattnaik, Rajib Mall, -Fundamentals of Mobile ComputingII, PHI Learning Pvt.Ltd, New Delhi – 2012





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S.No.	Subject Code	Subject Name	Name of the Content that include experiential learning through project work
8	CS8451	DESIGN AND ANALYSIS OF ALGORITHMS	<ul style="list-style-type: none"><li>• Asymptotic Notations and their properties</li><li>• Travelling Salesman Problem</li><li>• Knapsack Problem</li><li>• Floyd's Algorithm</li><li>• Multi stage Graph</li><li>• Optimal Binary Search Tree</li><li>• Prim's Algorithm and Krushkal's Algorithm</li><li>• NP-Hard Problems</li></ul>

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**OBJECTIVES:**

- To understand and apply the algorithm analysis techniques.
- To critically analyze the efficiency of alternative algorithmic solutions for the same problem
- To understand different algorithm design techniques.
- To understand the limitations of Algorithmic power.

**UNIT I INTRODUCTION**

9

Notion of an Algorithm – Fundamentals of Algorithmic Problem Solving – Important Problem Types – Fundamentals of the Analysis of Algorithmic Efficiency – Asymptotic Notations and their properties. Analysis Framework – Empirical analysis - Mathematical analysis for Recursive and Non-recursive algorithms - Visualization

**UNIT II BRUTE FORCE AND DIVIDE-AND-CONQUER**

9

Brute Force – Computing  $a^n$  – String Matching - Closest-Pair and Convex-Hull Problems - Exhaustive Search - Travelling Salesman Problem - Knapsack Problem - Assignment problem. Divide and Conquer Methodology – Binary Search – Merge sort – Quick sort – Heap Sort - Multiplication of Large Integers – Closest-Pair and Convex - Hull Problems.

**UNIT III DYNAMIC PROGRAMMING AND GREEDY TECHNIQUE**

9

Dynamic programming – Principle of optimality - Coin changing problem, Computing a Binomial Coefficient – Floyd's algorithm – Multi stage graph - Optimal Binary Search Trees – Knapsack Problem and Memory functions.

Greedy Technique – Container loading problem - Prim's algorithm and Kruskal's Algorithm – 0/1 Knapsack problem, Optimal Merge pattern - Huffman Trees.

**UNIT IV ITERATIVE IMPROVEMENT**

9

The Simplex Method - The Maximum-Flow Problem – Maximum Matching in Bipartite Graphs, Stable marriage Problem.

**UNIT V COPING WITH THE LIMITATIONS OF ALGORITHM POWER**

9

Lower - Bound Arguments - P, NP NP- Complete and NP Hard Problems. Backtracking – n-Queen problem - Hamiltonian Circuit Problem – Subset Sum Problem. Branch and Bound – LIFO Search and FIFO search - Assignment problem – Knapsack Problem – Travelling Salesman Problem - Approximation Algorithms for NP-Hard Problems – Travelling Salesman problem – Knapsack problem.

**TOTAL: 45 PERIODS****OUTCOMES:**

At the end of the course, the students should be able to:

- Design algorithms for various computing problems.
- Analyze the time and space complexity of algorithms.
- Critically analyze the different algorithm design techniques for a given problem.
- Modify existing algorithms to improve efficiency.

**TEXT BOOKS:**

1. Anany Levitin, -Introduction to the Design and Analysis of Algorithms, Third Edition, Pearson Education, 2012.
2. Ellis Horowitz, Sartaj Sahni and Sanguthevar Rajasekaran, Computer Algorithms/ C++, Second Edition, Universities Press, 2007.





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S.No.	Subject Code	Subject Name	Name of the Content that include experiential learning through project work
9	IT8501	WEB TECHNOLOGY	<ul style="list-style-type: none"><li>• XHTML</li><li>• The JavaScript Language</li><li>• Browsers and The DOM</li><li>• XSLT</li><li>• WSDL</li><li>• XML-Schema</li></ul>

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IT8501

WEB TECHNOLOGY

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OBJECTIVES:

- To understand about client-server communication and protocols used during communication.
- To design interactive web pages using Scripting languages.
- To learn server side programming using servlets and JSP.
- To develop web pages using XML/XSLT.

UNIT I WEB SITE BASICS AND HTML 9

Web Essentials: Clients, Servers, and Communication. The Internet-Basic Internet Protocols -The World Wide Web-HTTP request message-response message-Web Clients Web Servers. Markup Languages: XHTML. An Introduction to HTML History-Versions-Basic XHTML Syntax and Semantics-Some Fundamental HTML Elements-Relative URLs-Lists-tables-Frames-Forms-HTML 5.0.

UNIT II CSS AND CLIENT SIDE SCRIPTING 9

Style Sheets: CSS-Introduction to Cascading Style Sheets-Features-Core Syntax-Style Sheets and HTML- Style Rule Cascading and Inheritance-Text Properties-Box Model Normal Flow Box Layout-Beyond the Normal Flow-CSS3.0. Client-Side Programming: The JavaScript Language-History and Versions Introduction JavaScript in Perspective-Syntax-Variables and Data Types-Statements-Operators-Literals-Functions-Objects-Arrays-Built-in Objects-JavaScript Debuggers.

UNIT III SERVER SIDE SCRIPTING 9

Host Objects: Browsers and the DOM-Introduction to the Document Object Model DOM History and Levels-Intrinsic Event Handling-Modifying Element Style-The Document Tree-DOM Event Handling-Accommodating Noncompliant Browsers Properties of window. Server-Side Programming: Java Servlets- Architecture -Overview-A Servlet-Generating Dynamic Content-Life Cycle- Parameter Data-Sessions-Cookies-URL Rewriting-Other Capabilities-Data Storage Servlets and Concurrency-Databases and Java Servlets.

UNIT IV JSP AND XML 9

Separating Programming and Presentation: JSP Technology Introduction-JSP and Servlets-Running JSP Applications Basic JSP-JavaBeans Classes and JSP-Tag Libraries and Files-Support for the Model-View-Controller Paradigm- Databases and JSP. Representing Web Data: XML-Documents and Vocabularies-Versions and Declaration-Namespaces- DOM based XML processing Event-oriented Parsing: SAX-Transforming XML Documents-Selecting XML Data: XPATH-Template based Transformations: XSLT-Displaying XML Documents in Browsers.

UNIT V AJAX AND WEB SERVICES 9

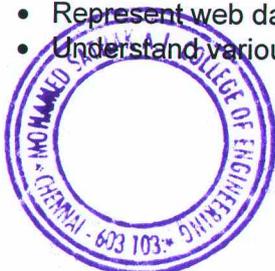
AJAX: Ajax Client Server Architecture-XML Http Request Object-Call Back Methods. Web Services: JAX-RPC-Concepts-Writing a Java Web Service-Writing a Java Web Service Client-Describing Web Services: WSDL- Representing Data Types: XML Schema-Communicating Object Data: SOAP Related Technologies-Software Installation-Storing Java Objects as Files.

TOTAL 45 PERIODS

OUTCOMES:

At the end of the course, the student should be able to:

- Design simple web pages using markup languages like HTML and XHTML.
- Create dynamic web pages using DHTML and java script that is easy to navigate and use.
- Program server side web pages that have to process request from client side web pages.
- Represent web data using XML and develop web pages using JSP.
- Understand various web services and how these web services interact.



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S.No.	Subject Code	Subject Name	Name of the Content that include experiential learning through project work
10	IT8076	SOFTWARE TESTING	<ul style="list-style-type: none"><li>• Coverage and Control Flow Graphs</li><li>• Adhoc Testing</li><li>• Alpha Beta Tests</li><li>• Testing OO Systems</li><li>• The Structure of Testing Groups</li></ul>

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**OBJECTIVES:**

- To learn the criteria for test cases.
- To learn the design of test cases.
- To understand test management and test automation techniques
- To apply test metrics and measurements.

**UNIT I INTRODUCTION**

9

Testing as an Engineering Activity – Testing as a Process – Testing Maturity Model- Testing axioms – Basic definitions – Software Testing Principles – The Tester's Role in a Software Development Organization – Origins of Defects – Cost of defects – Defect Classes – The Defect Repository and Test Design –Defect Examples- Developer/Tester Support of Developing a Defect Repository.

**UNIT II TEST CASE DESIGN STRATEGIES**

9

Test case Design Strategies – Using Black Box Approach to Test Case Design – Boundary Value Analysis – Equivalence Class Partitioning – State based testing – Cause-effect graphing – Compatibility testing – user documentation testing – domain testing - Random Testing – Requirements based testing – Using White Box Approach to Test design – Test Adequacy Criteria – static testing vs. structural testing – code functional testing – Coverage and Control Flow Graphs – Covering Code Logic – Paths – code complexity testing – Additional White box testing approaches- Evaluating Test Adequacy Criteria.

**UNIT III LEVELS OF TESTING**

9

The need for Levels of Testing – Unit Test – Unit Test Planning – Designing the Unit Tests – The Test Harness – Running the Unit tests and Recording results – Integration tests – Designing Integration Tests – Integration Test Planning – Scenario testing – Defect bash elimination System Testing – Acceptance testing – Performance testing – Regression Testing – Internationalization testing – Ad-hoc testing – Alpha, Beta Tests – Testing OO systems – Usability and Accessibility testing – Configuration testing –Compatibility testing – Testing the documentation – Website testing.

**UNIT IV TEST MANAGEMENT**

9

People and organizational issues in testing – Organization structures for testing teams – testing services – Test Planning – Test Plan Components – Test Plan Attachments – Locating Test Items – test management – test process – Reporting Test Results – Introducing the test specialist – Skills needed by a test specialist – Building a Testing Group- The Structure of Testing Group- .The Technical Training Program.

**UNIT V TEST AUTOMATION**

9

Software test automation – skills needed for automation – scope of automation – design and architecture for automation – requirements for a test tool – challenges in automation – Test metrics and measurements – project, progress and productivity metrics.

**TOTAL: 45 PERIODS****OUTCOMES:**

At the end of the course the students will be able to:

- Design test cases suitable for a software development for different domains.
- Identify suitable tests to be carried out.
- Prepare test planning based on the document.
- Document test plans and test cases designed.
- Use automatic testing tools.
- Develop and validate a test plan.





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S.No.	Subject Code	Subject Name	Name of the Content that include experiential learning through project work
11	IT8073	INFORMATION SECURITY	<ul style="list-style-type: none"><li>• Risk Management</li><li>• ISO 17799/BS 7799, NIST Models</li><li>• Cryptography, Access Control Devices</li></ul>

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IT8073

**INFORMATION SECURITY**

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**OBJECTIVES:**

- To understand the basics of Information Security
- To know the legal, ethical and professional issues in Information Security
- To know the aspects of risk management
- To become aware of various standards in this area
- To know the technological aspects of Information Security

**UNIT I INTRODUCTION**

9

History, What is Information Security?, Critical Characteristics of Information, NSTISSC Security Model, Components of an Information System, Securing the Components, Balancing Security and Access, The SDLC, The Security SDLC

**UNIT II SECURITY INVESTIGATION**

9

Need for Security, Business Needs, Threats, Attacks, Legal, Ethical and Professional Issues - An Overview of Computer Security - Access Control Matrix, Policy-Security policies, Confidentiality policies, Integrity policies and Hybrid policies

**UNIT III SECURITY ANALYSIS**

9

Risk Management: Identifying and Assessing Risk, Assessing and Controlling Risk - Systems: Access Control Mechanisms, Information Flow and Confinement Problem

**UNIT IV LOGICAL DESIGN**

9

Blueprint for Security, Information Security Policy, Standards and Practices, ISO 17799/BS 7799, NIST Models, VISA International Security Model, Design of Security Architecture, Planning for Continuity

**UNIT V PHYSICAL DESIGN**

9

Security Technology, IDS, Scanning and Analysis Tools, Cryptography, Access Control Devices, Physical Security, Security and Personnel

**TOTAL 45 PERIODS**

**OUTCOMES:**

**At the end of this course, the students should be able to:**

- Discuss the basics of information security
- Illustrate the legal, ethical and professional issues in information security
- Demonstrate the aspects of risk management.
- Become aware of various standards in the Information Security System
- Design and implementation of Security Techniques.

**TEXT BOOK:**

1. Michael E Whitman and Herbert J Mattord, -Principles of Information Securityll, Vikas Publishing House, New Delhi, 2003

**REFERENCES:**

1. Micki Krause, Harold F. Tipton, — Handbook of Information Security Managementll, Vol 1-3 CRCPress LLC, 2004.
2. Stuart McClure, Joel Scrambray, George Kurtz, -Hacking Exposedll, Tata McGraw-Hill, 2003
3. Matt Bishop, -Computer Security Art and Sciencell, Pearson/PHI, 2002.



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# MOHAMEDSATHAKAJCOLLEGEENGINEERING

(Approved by AICTE, New Delhi and affiliated to Anna University, Chennai)

Siruseri IT Park, Egattur, Chennai - 603 103

S.No.	Subject Code	Subject Name	Name of the Content that include experiential learning through project work
12	CS8792	CRYPTOGRAPHY AND NETWORK SECURITY	<ul style="list-style-type: none"><li>• OSI security architecture</li><li>• Symmetric Key Cryptography</li><li>• Symmetric Key Ciphers</li><li>• Asymmetric Key Cryptography</li><li>• Asymmetric Key Ciphers</li><li>• MAC</li><li>• Hash function</li><li>• S/MIME</li><li>• IP security</li></ul>

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CS8792

CRYPTOGRAPHY AND NETWORK SECURITY

L T P C  
3 0 0 3

OBJECTIVES:

- To understand Cryptography Theories, Algorithms and Systems.
- To understand necessary Approaches and Techniques to build protection mechanisms in order to secure computer networks.

UNIT I INTRODUCTION

9

Security trends - Legal, Ethical and Professional Aspects of Security, Need for Security at Multiple levels, Security Policies - Model of network security – Security attacks, services and mechanisms – OSI security architecture – Classical encryption techniques: substitution techniques, transposition techniques, steganography).- Foundations of modern cryptography: perfect security – information theory – product cryptosystem – cryptanalysis.

UNIT II SYMMETRIC CRYPTOGRAPHY

9

MATHEMATICS OF SYMMETRIC KEY CRYPTOGRAPHY: Algebraic structures - Modular arithmetic-Euclid's algorithm- Congruence and matrices - Groups, Rings, Fields- Finite fields- SYMMETRIC KEY CIPHERS: SDES – Block cipher Principles of DES – Strength of DES – Differential and linear cryptanalysis - Block cipher design principles – Block cipher mode of operation – Evaluation criteria for AES – Advanced Encryption Standard - RC4 – Key distribution.

UNIT III PUBLIC KEY CRYPTOGRAPHY

9

MATHEMATICS OF ASYMMETRIC KEY CRYPTOGRAPHY: Primes – Primality Testing – Factorization – Euler's totient function, Fermat's and Euler's Theorem - Chinese Remainder Theorem – Exponentiation and logarithm - ASYMMETRIC KEY CIPHERS: RSA cryptosystem – Key distribution – Key management – Diffie Hellman key exchange - ElGamal cryptosystem – Elliptic curve arithmetic-Elliptic curve cryptography.

UNIT IV MESSAGE AUTHENTICATION AND INTEGRITY

9

Authentication requirement – Authentication function – MAC – Hash function – Security of hash function and MAC – SHA –Digital signature and authentication protocols – DSS- Entity Authentication: Biometrics, Passwords, Challenge Response protocols- Authentication applications - Kerberos, X.509

UNIT V SECURITY PRACTICE AND SYSTEM SECURITY

9

Electronic Mail security – PGP, S/MIME – IP security – Web Security - SYSTEM SECURITY: Intruders – Malicious software – viruses – Firewalls.

TOTAL 45 PERIODS

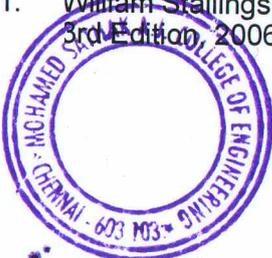
OUTCOMES:

At the end of the course, the student should be able to:

- Understand the fundamentals of networks security, security architecture, threats and vulnerabilities
- Apply the different cryptographic operations of symmetric cryptographic algorithms
- Apply the different cryptographic operations of public key cryptography
- Apply the various Authentication schemes to simulate different applications.
- Understand various Security practices and System security standards

TEXT BOOK:

1. William Stallings, Cryptography and Network Security: Principles and Practice, PHI 3rd Edition, 2006.





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S.No.	Subject Code	Subject Name	Topics Covered
13	CS8591	COMPUTER NETWORKS	<ul style="list-style-type: none"><li>• OSI Model</li><li>• Ethernet</li><li>• Network Layer Protocols</li><li>• WWW and HTTP</li><li>• FTP</li></ul>

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CS8591

COMPUTER NETWORKS

L T P C  
3 0 0 3

OBJECTIVES:

- To understand the protocol layering and physical level communication.
- To analyze the performance of a network.
- To understand the various components required to build different networks.
- To learn the functions of network layer and the various routing protocols.
- To familiarize the functions and protocols of the Transport layer.

UNIT I INTRODUCTION AND PHYSICAL LAYER 9

Networks – Network Types – Protocol Layering – TCP/IP Protocol suite – OSI Model – Physical Layer: Performance – Transmission media – Switching – Circuit-switched Networks – Packet Switching.

UNIT II DATA-LINK LAYER & MEDIA ACCESS 9

Introduction – Link-Layer Addressing – DLC Services – Data-Link Layer Protocols – HDLC – PPP - Media Access Control - Wired LANs: Ethernet - Wireless LANs – Introduction – IEEE 802.11, Bluetooth – Connecting Devices.

UNIT III NETWORK LAYER 9

Network Layer Services – Packet switching – Performance – IPV4 Addresses – Forwarding of IP Packets - Network Layer Protocols: IP, ICMP v4 – Unicast Routing Algorithms – Protocols – Multicasting Basics – IPV6 Addressing – IPV6 Protocol.

UNIT IV TRANSPORT LAYER 9

Introduction – Transport Layer Protocols – Services – Port Numbers – User Datagram Protocol – Transmission Control Protocol – SCTP.

UNIT V APPLICATION LAYER 9

WWW and HTTP – FTP – Email – Telnet – SSH – DNS – SNMP.

TOTAL : 45 PERIODS

OUTCOMES:

On Completion of the course, the students should be able to:

- Understand the basic layers and its functions in computer networks.
- Evaluate the performance of a network.
- Understand the basics of how data flows from one node to another.
- Analyze and design routing algorithms.
- Design protocols for various functions in the network.
- Understand the working of various application layer protocols

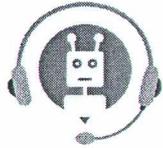
TEXT BOOK:

1. Behrouz A. Forouzan, Data Communications and Networking, Fifth Edition TMH, 2013.

REFERENCES

1. Larry L. Peterson, Bruce S. Davie, Computer Networks: A Systems Approach, Fifth Edition, Morgan Kaufmann Publishers Inc., 2012.
2. William Stallings, Data and Computer Communications, Tenth Edition, Pearson Education, 2013.
3. Nader F. Mir, Computer and Communication Networks, Second Edition, Prentice Hall, 2014.





# worksbot

## CERTIFICATE OF INTERNSHIP

This is to certify that

**JOTHIKA M**

student of Mohamed Sathak A.J. College of  
Engineering has done his/her internship on  
**Python Full Stack Development** in our  
organization **Worksbot Applications Pvt.  
Ltd., Chennai** from **April 2021 - June 2021**  
We wish him/her all the best for the future.

Murali T  
Head - Human Resource

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Month: July 2021



# DOPE MOCK TESTER

A PROJECT REPORT

*Submitted by*

KABILAN R [311817205003]

VIGNESH V [311817205007]

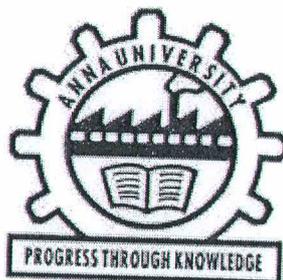
*in partial fulfillment for the award of the degree*

*of*

**BACHELOR OF TECHNOLOGY**

IN

**INFORMATION TECHNOLOGY**



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## BONAFIDE CERTIFICATE

Certified that this project report "DOPE MOCK TESTER" is the Bonafide work of KABILAN R [311817205003] and VIGNESH V [311817205007] who carried out the project work under my supervision.



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Submitted for the project viva voice on 06.08.2021



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EXTERNAL EXAMINER



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# OXUINO

## DOPE MOCK TESTER

### ABSTRACT

Oxuiino – This project is to improve the effectiveness of drug test in sports by sensing the oxygen level of the sport person. The Sport Associations are till now using the traditional methods that is collection of blood and urine samples for the testing process. According to WADA, it's challenging to store the samples and performing test at certain period of times. To improve the Dope detection accuracy and make the efficiency, a new approach based on the interfacing of Arduino and oxygen sensor is proposed and it sense the oxygen level of athletes and achieves the testing with 99.04% detecting rate, this innovative and effective technique obviously outperforms the traditional testing methods.



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## CONCLUSION

This research makes a number of significant and valuable contributions to the WADA and sports associations. Unlike the traditional method, which takes time and storage space for the testing, this Oxuino Dope Detecting kit is user-friendly and gives accurate results. The drugged athlete can be easily judged by sensing their Oxygen level and result is provided instantly which will be useful for deserving athlete and also for association to detect the undeserving candidate and fraudulent in sports.



A handwritten signature in blue ink, appearing to be "M. Sathak".

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# HEART DISEASE CLASSIFICATION USING SVM AND RANDOM FOREST ALGORITHM

A PROJECT REPORT

*Submitted by*

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**VINODHA K (311817205704)**

*In partial fulfillment for the award of the degree*

*of*

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**APRIL 2021**



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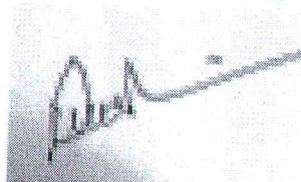
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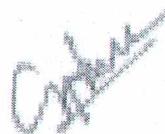
Department of Information  
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Submitted for the project viva voce on 08.8.2021



**INTERNAL EXAMINER**



**EXTERNAL EXAMINER**



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# Abstract

Heart disease is the one of the most life threatening disease for human life in this world. WHO reports every 34 secs a person died with heart disease .So, prediction of the heart diseases in the earlier stage helps to save the human life from death. Data mining methods like classification or clustering are used to find the heart diseases in the earlier stage by recording the history of the person. But these approaches are taking more time to provide the results of the person. To resolve, this time delay. The proposal system uses SVM and RF classification techniques, Thus the Machine Learning algorithms. Efficiently reduce the time delay for finding a person in having heart diseases or not. This reduced time delay saves more number of human life.



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## CHAPTER 7

### CONCLUSION

This project proposes a novel and effective soil classification method based on image processing. This method is used to minimize the time to find out the chemical and organic fertilizer need to add for the soil to yield more crops.

#### 7.1 EXPERIMENTAL RESULT

The collected data set was pre-processed and some records are removed from the data. After preprocessing step, the data set was converted into Low, Medium and High based on nutrients level mentioned in. Apply CNN, RNN and ANN algorithm to classify the soil nutrients as Very High, High, Medium, Low and Very Low. The execution time and the accuracy rate of classification algorithms with the types of nutrients is compared and executes the final result.

#### 7.2 FUTURE ENHANCEMENT:

The project was successfully implemented and done. However, the proponents would like to make the following recommendations to further improve the project. Collect more soil samples for the data sets which could yield on more accurate results.



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**DIABETES PREDICTION AND CLASSIFICATION  
USING ENSEMBLING OF DIFFERENT MACHINE  
LEARNING ALGORITHMS**

**A PROJECT REPORT**

*Submitted by*

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<b>JOTHIKA M</b>	<b>311817205703</b>

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**APRIL 2021**



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Ms.J. RESHMA FARHIM, M.E.,  
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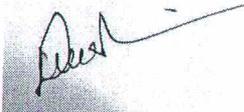
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**INTERNAL EXAMINER**



**EXTERNAL EXAMINER**



## ABSTRACT

Diabetes or Diabetes Mellitus (DM) a major metabolic disorder, can be caused due to age, obesity, lack of exercise, hereditary diabetes, living style, bad diet, high blood pressure, etc., entire body system can be influenced harmfully which will lead to creating diseases in heart, kidney, eye and other organs in the body. Hence early diagnosis and treatment is required in order to prevent the diseases. Recent Machine Learning (ML) techniques are used in accurate predictions and in improving the performance. The project focuses on ML classification techniques in PIDD (Pima Indian Diabetes Dataset) sourced from UCI ML repository to forecast the likelihood of diabetes in patients with utmost correctness using Python. Six ML techniques were used in the experiment to detect diabetes at an early stage and the performance of these algorithms is validated using measures i.e. Error Rate, Accuracy, Precision, Recall and F- Measure. KNN was found outperform all the ML algorithm showing the maximum accuracy of 79.17% in comparison to other algorithm.



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## CHAPTER 9

### CONCLUSION

The Amount of Research work has been done for Prediction of diabetes using data mining technique. The bottom up summarization technique uses when patient has high risk of diabetes. The K-Nearest Neighbor Algorithm, Bayesian Classifier, Naïve Bayesian Classifier, Artificial Neural Network, Bayesian Network, Association Rule Mining all methods used for prediction of diabetes which gives patient's condition of Normal, Pre-diabetes, Diabetes. In K-Nearest neighbor algorithm always need to determine the value of K. All above methods used to predict diabetes. But if Patient is detected as diabetes firstly there is a need of finding Control and Un-control condition of diabetes. Because if Patient has diabetes in Uncontrolled condition, may be the patient has severe effect on Patient's Organ like Heart, Eye, Kidney etc. So there is need of finding early Severity which may be help patient for reducing the Severity on Organ or Halting the Severe Effect on Organ.

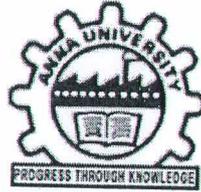
### FUTURE WORK:

**Ensembling for Supervised Learning:** In Ensembling technique we create multiple models and then combine those models to improve results. This method produces more accurate result than a stand-alone model would actually produce. Base models is the model which helps to create ensemble models. Ensembling is done via the Voting Ensemble. Voting is the appropriate way of merging the predictions from multiple machine learning models. First create two or more standalone models from the training data-set. A Voting Classifier is used to wrap standalone models and take the mean of the predictions of the sub-models. So, we can use Ensemble Learner to increase the recall value of the diabetes patient. We have tried to apply ensemble learning between Logistic Regression and Linear SVM but the overall accuracy decreased. We will try to do this as a future work.

**Parallel Processing for Neural Network:** While optimizing the parameter of our Neural Network using Grid Search we were doing it in Concurrent Processing. So, we would like do it in Parallel Processing in future to decrease the training time.



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**BRAIN TUMOR CLASSIFICATION IN MRI USING  
Mask- RCNN**

**A PROJECT REPORT**

*Submitted by*

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RANJITH.T                311817205006**

*In partial fulfillment for the award of the degree  
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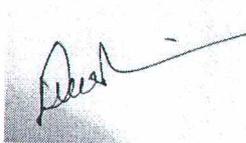


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### BONAFIDE CERTIFICATE

Certified that this project report “**BRAIN TUMOR CLASSIFICATION IN MRI USING Mask - RCNN**” is the Bonafide work of **RANJITH.T (311817205006)**, **MOHAMEDHANAZ.N (311817205004)** who carried out the project work under my supervision.



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Associate Professor

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Mr.G.RAMA MOHAN REDDY M.Tech.

**SUPERVISOR**

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Project Viva-Voce held on 06.08.2021



INTERNAL EXAMINER



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EXTERNAL EXAMINER

## ABSTRACT

Machine learning, evolution computation, vision, robotics, speech processing, natural language process and planning are some of the building blocks of artificial intelligence (AI). Over the years AI has developed a lot and contributed its own share to make human life easy and compact. Technology happens to be a term with various definitions and it keeps changing with time. From a computer as big as a room to a computer on your finger tips technology has developed and so has the human race. The need of the time is quick results with accurate answers in the easiest way possible. AI is the current most developing field and has shown some extra ordinary results which have proved its importance. Use of AI has been adapted in almost all fields and where ever possible. Neural network is one of the small components under this big umbrella of artificial intelligence. Medical field has also developed itself over the time and has increased the life expectancy. The entire idea behind this project is to use neural networks and the medical knowledge hand in hand.

**Keywords** - Machine Learning, Mask RCNN, brain tumor.



  
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## CHAPTER-8

### CONCLUSION

Algorithms for analyzing and classifying medical images have gained a great level of attention recently. The experiments we present in this work show that after preprocessing MRI images, Mask RCNN classification algorithm was the best. A much higher accuracy can be achieved by gaining a better dataset with high-resolution MRI images.

### Future Work

The future work may be extended this feature extraction process in terms of deep learning neural network. Mask RCNN are the most delicate network for the field of image processing and also the algorithm need to be extended for segmenting the tumorous area.



A handwritten signature in blue ink, appearing to be "M. Sathak".

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# A FRAMEWORK TO RECOGNIZE AND DETECT BREAST CANCER FROM MAMMOGRAM IMAGES

A Project Report

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**VISHNU T (311817205008)**

*In partial fulfilment for the award of the degree*

*Of*

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*Vishnu T*

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Certified that this project report titled “A FRAMEWORK TO RECOGNIZE AND DETECT BREAST CANCER FROM MAMMOGRAM IMAGES” is the bonafide work of “PRAKASH R (311817205005), VISHNU T (311817205008)” who carried out the project work under my supervision.

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Mrs. A. SARANYA, M.E.,  
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Submitted for the project viva voce on 06.08.2021

**INTERNAL EXAMINER**  
**ABSTRACT**



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**EXTERNAL EXAMINER**

## ABSTRACT

Breast cancer is one of the most leading causes of death among women. The early detection of abnormalities in breast enables the radiologist in diagnosing the breast cancer easily. Efficient tools in diagnosing the cancerous breast will help the medical experts in accurate diagnosis and timely treatment to the patients. In this work, experiments were carried out using Wisconsin Diagnosis Breast Cancer database to classify the breast cancer as either benign or malignant. Supervised learning algorithm -Support Vector Machine (SVM) with kernels like Linear, and Neural Network (NN) are used for comparison to achieve this task. The performances of the models are analyzed where Neural Network approach provides more 'accuracy' and 'precision' as compared to Support Vector Machine in the classification of breast cancer, and seems to be fast and efficient method.



  
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## CHAPTER 9

### CONCLUSION:

This project demonstrates the modeling of breast cancer as classification task and describes the implementation of Neural Network (NN) and Support Vector Machine (SVM) approach for classifying breast cancer as either benign or malignant. The results of both NN and SVM were compared on the basis of accuracy and precision. It was observed that classification implemented.

by Neural Network technique in this paper is more efficient compare to SVM as seen in the accuracy and precision. Based on the results, NN technique is more efficient compared to SVM technique in breast cancer.

. A typical benign mass has a round, smooth and well circumscribed boundary; on the other hand, a malignant tumor usually has speculated, rough, and blurry boundary. Computer aided detection (CAD) systems in screening mammography serve as a second opinion for radiologists by identifying regions with high suspicious of malignancy.



  
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