B.E – COMPUTER SCIENCE AND ENGINEERING

S.NO	Name of the course that include experiential learning through Project work/ Internship
1	CS6202 - Programming and Data Structures I
2	CS6301 - Programming and Data Structure II
3	CS6001 - C# and .Net programming
4	CS6703 - Grid and Cloud Computing
5	CS6302 - Database Management Systems
6	CS6551 - Computer Networks
7	CS6659 - Artificial Intelligence
8	CS6701 - Cryptography and Network Security
9	CS6008 - Human Computer Interaction
10	CS6601 - Distributed Systems
11	CS6501 - Internet Programming
12	CS6402 - Design and Analysis of Algorithms
13	CS6704 - Resource Management Techniques
14	CS6502 - Object Oriented Analysis and Design
15	CS6504 - Computer Graphics
16	CS6201 - Digital Principles and System Design
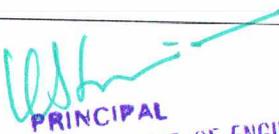
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CS6202   PROGRAMMING AND DATA STRUCTURES I   L T P C
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OBJECTIVES:

The student should be made to:

- Be familiar with the basics of C programming language.
- Be exposed to the concepts of ADTs
- Learn linear data structures - list, stack, and queue.
- Be exposed to sorting, searching, hashing algorithms

UNIT I   C PROGRAMMING FUNDAMENTALS- A REVIEW   9

Conditional statements – Control statements – Functions – Arrays – Preprocessor - Pointers - Variation in pointer declarations - Function Pointers - Function with Variable number of arguments

UNIT II   C PROGRAMMING ADVANCED FEATURES   9

Structures and Unions - File handling concepts – File read – write – binary and Stdio - File Manipulations

UNIT III   LINEAR DATA STRUCTURES – LIST   9

Abstract Data Types (ADTs) - List ADT - array-based implementation – linked list implementation – singly linked lists- circularly linked lists- doubly-linked lists - applications of lists -Polynomial Manipulation – All operation (Insertion, Deletion, Merge, Traversal)

UNIT IV   LINEAR DATA STRUCTURES – STACKS, QUEUES   9

Stack ADT - Evaluating arithmetic expressions- other applications- Queue ADT - circular queue implementation – Double ended Queues - applications of queues

UNIT V   SORTING, SEARCHING AND HASH TECHNIQUES   9

Sorting algorithms: Insertion sort - Selection sort - Shell sort - Bubble sort - Quick sort - Merge sort - Radix sort – Searching: Linear search -Binary Search Hashing: Hash Functions – Separate Chaining – Open Addressing – Rehashing – Extendible Hashing.

                                            TOTAL: 45 PERIODS

OUTCOMES:

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

- Use the control structures of C appropriately for problems.
- Implement abstract data types for linear data structures.
- Apply the different linear data structures to problem solutions.
- Critically analyse the various algorithms.

TEXT BOOKS:

1. Brian W. Kernighan and Dennis M. Ritchie, "The C Programming Language", 2nd Edition, Pearson Education, 1988.
2. Mark Allen Weiss, "Data Structures and Algorithm Analysis in C", 2nd Edition, Pearson Education, 1997.

REFERENCES:

1. Thomas H. Cormen, Charles E. Leiserson, Ronald L.Rivest, Clifford Stein, "Introduction to Algorithms", Second Edition, Mcgraw Hill, 2002.
2. Reema Thareja, "Data Structures Using C", Oxford University Press, 2011
3. Aho, Hopcroft and Ullman, "Data Structures and Algorithms", Pearson Education,1983.
4. Stephen G. Kochan, "Programming in C", 3rd edition, Pearson Ed

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CS6301   PROGRAMMING AND DATA STRUCTURES II   L T P C
                                                                          3 0 0 3
OBJECTIVES:
The student should be made to:
- Be familiar with the C++ concepts of abstraction, encapsulation, constructor, polymorphism, overloading and Inheritance.
- Learn advanced nonlinear data structures.
- Be exposed to graph algorithms
- Learn to apply Tree and Graph structures

UNIT I   OBJECT ORIENTED PROGRAMMING FUNDAMENTALS   9
C++ Programming features - Data Abstraction - Encapsulation - class - object - constructors - static members – constant members – member functions – pointers – references - Role of this pointer – Storage classes – function as arguments.

UNIT II   OBJECT ORIENTED PROGRAMMING CONCEPTS   9
String Handling – Copy Constructor - Polymorphism - compile time and run time polymorphisms – function overloading - operators overloading – dynamic memory allocation - Nested classes - Inheritance – virtual functions.

UNIT III   C++ PROGRAMMING ADVANCED FEATURES   9
Abstract class – Exception handling - Standard libraries - Generic Programming - templates – class template - function template – STL – containers – iterators – function adaptors – allocators - Parameterizing the class - File handling concepts.

UNIT IV   ADVANCED NON-LINEAR DATA STRUCTURES   9
AVL trees - B-Trees - Red-Black trees - Splay trees - Binomial Heaps - Fibonacci Heaps - Disjoint Sets - Amortized Analysis - accounting method - potential method - aggregate analysis.

UNIT V   GRAPHS   9
Representation of Graphs - Breadth-first search - Depth-first search - Topological sort - Minimum Spanning Trees - Kruskal and Prim algorithm - Shortest path algorithm - Dijkstra"s algorithm - Bellman-Ford algorithm – Floyd - Warshall algorithm.

                                                        TOTAL: 45 PERIODS

OUTCOMES:
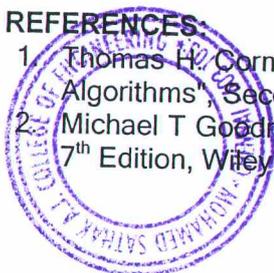**At the end of the course, the student should be able to:**
- Design problem solutions using Object Oriented Techniques.
- Apply the concepts of data abstraction, encapsulation and inheritance for problem solutions.
- Use the control structures of C++ appropriately.
- Critically analyse the various algorithms.
- Apply the different data structures to problem solutions.

TEXT BOOKS:
1. Bjarne Stroustrup, "The C++ Programming Language", 3rd Edition, Pearson Education, 2007.
2. Mark Allen Weiss, "Data Structures and Algorithm Analysis in C++", 2nd Edition, Pearson Education, 2005

REFERENCES:
1. Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest and Clifford Stein, "Introduction to Algorithms", Second Edition, Mc Graw Hill, 2002.
2. Michael T Goodrich, Roberto Tamassia, David Mount, "Data Structures and Algorithms in C++", 7th Edition, Wiley Publishers, 2004.

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CS6001   C# AND .NET PROGRAMMING   L T P C
                                  3 0 0 3

OBJECTIVES:
The student should be made to:
- Understand the foundations of CLR execution.
- Learn the technologies of the .NET framework.
- Know the object oriented aspects of C#.
- Be aware of application development in .NET.
- Learn web based applications on .NET (ASP.NET).

UNIT I   INTRODUCTION TO C#   9
Introducing C#, Understanding .NET, overview of C#, Literals, Variables, Data Types, Operators, checked and unchecked operators, Expressions, Branching, Looping, Methods, implicit and explicit casting, Constant, Arrays, Array Class, Array List, String, String Builder, Structure, Enumerations, boxing and unboxing.

UNIT II   OBJECT ORIENTED ASPECTS OF C#   9
Class, Objects, Constructors and its types, inheritance, properties, indexers, index overloading, polymorphism, sealed class and methods, interface, abstract class, abstract and interface, operator overloading, delegates, events, errors and exception, Threading.

UNIT III   APPLICATION DEVELOPMENT ON .NET   9
Building windows application, Creating our own window forms with events and controls, menu creation, inheriting window forms, SDI and MDI application, Dialog Box(Modal and Modeless), accessing data with ADO.NET, DataSet, typed dataset, Data Adapter, updating database using stored procedures, SQL Server with ADO.NET, handling exceptions, validating controls, windows application configuration.

UNIT IV   WEB BASED APPLICATION DEVELOPMENT ON .NET   9
Programming web application with web forms, ASP.NET introduction, working with XML and .NET, Creating Virtual Directory and Web Application, session management techniques, web.config, web services, passing datasets, returning datasets from web services, handling transaction, handling exceptions, returning exceptions from SQL Server.

UNIT V   CLR AND .NET FRAMEWORK   9
Assemblies, Versoning, Attributes, reflection, viewing meta data, type discovery, reflection on type, marshalling, remoting, security in .NET

                        TOTAL: 45 PERIODS

OUTCOMES:
After completing this course, the student will be able to:
- List the major elements of the .NET frame work
- Explain how C# fits into the .NET platform.
- Analyze the basic structure of a C# application
- Debug, compile, and run a simple application.
- Develop programs using C# on .NET
- Design and develop Web based applications on .NET
- Discuss CLR.

TEXT BOOKS:
1. Herbert Schildt, "The Complete Reference: C# 4.0", Tata Mc Graw Hill, 2012.
2. Christian Nagel et al. "Professional C# 2012 with .NET 4.5", Wiley India, 2012.

CS6703   GRID AND CLOUD COMPUTING   L T P C
                                                                3 0 0 3

OBJECTIVES:
The student should be made to:
- Understand how Grid computing helps in solving large scale scientific problems.
- Gain knowledge on the concept of virtualization that is fundamental to cloud computing.
- Learn how to program the grid and the cloud.
- Understand the security issues in the grid and the cloud environment.

UNIT I   INTRODUCTION   9
Evolution of Distributed computing: Scalable computing over the Internet - Technologies for network based systems - clusters of cooperative computers - Grid computing Infrastructures - cloud computing - service oriented architecture - Introduction to Grid Architecture and standards - Elements of Grid – Overview of Grid Architecture.

UNIT II   GRID SERVICES   9
Introduction to Open Grid Services Architecture (OGSA) - Motivation - Functionality Requirements - Practical & Detailed view of OGSA/OGSI - Data intensive grid service models - OGSA services.

UNIT III   VIRTUALIZATION   9
Cloud deployment models: public, private, hybrid, community - Categories of cloud computing: Everything as a service: Infrastructure, platform, software - Pros and Cons of cloud computing - Implementation levels of virtualization - virtualization structure - virtualization of CPU, Memory and I/O devices - virtual clusters and Resource Management - Virtualization for data center automation.

UNIT IV   PROGRAMMING MODEL   9
Open source grid middleware packages – Globus Toolkit (GT4) Architecture , Configuration – Usage of Globus – Main components and Programming model - Introduction to Hadoop Framework - Mapreduce, Input splitting, map and reduce functions, specifying input and output parameters, configuring and running a job – Design of Hadoop file system, HDFS concepts, command line and java interface, dataflow of File read & File write.

UNIT V   SECURITY   9
Trust models for Grid security environment – Authentication and Authorization methods – Grid security infrastructure - Cloud Infrastructure security: network, host and application level - aspects of data security, provider data and its security, Identity and access management architecture, IAM practices in the cloud, SaaS, PaaS, IaaS availability in the cloud, Key privacy issues in the cloud.

                                                       TOTAL: 45 PERIODS
OUTCOMES:
At the end of the course, the student should be able to:
- Apply grid computing techniques to solve large scale scientific problems.
- Apply the concept of virtualization.
- Use the grid and cloud tool kits.
- Apply the security models in the grid and the cloud environment.

TEXT BOOK:
1. Kai Hwang, Geoffery C. Fox and Jack J. Dongarra, "Distributed and Cloud Computing: Clusters, Grids, Clouds and the Future of Internet", First Edition, Morgan Kaufman Publisher, an Imprint of Elsevier, 2012.

CS6302   **DATABASE MANAGEMENT SYSTEMS**   **L T P C**
                                                                                  3 0 0 3

OBJECTIVES:
- To expose the students to the fundamentals of Database Management Systems.
- To make the students understand the relational model.
- To familiarize the students with ER diagrams.
- To expose the students to SQL.
- To make the students to understand the fundamentals of Transaction Processing and Query Processing.
- To familiarize the students with the different types of databases.
- To make the students understand the Security Issues in Databases.

UNIT I   INTRODUCTION TO DBMS   10
File Systems Organization - Sequential, Pointer, Indexed, Direct - Purpose of Database System- Database System Terminologies-Database characteristics- Data models – Types of data models – Components of DBMS- Relational Algebra. LOGICAL DATABASE DESIGN: Relational DBMS - Codd's Rule - Entity-Relationship model - Extended ER Normalization – Functional Dependencies, Anomaly- 1NF to 5NF- Domain Key Normal Form – Denormalization

UNIT II   SQL & QUERY OPTIMIZATION   8
SQL Standards - Data types - Database Objects- DDL-DML-DCL-TCL-Embedded SQL-Static Vs Dynamic SQL - QUERY OPTIMIZATION: Query Processing and Optimization - Heuristics and Cost Estimates in Query Optimization.

UNIT III   TRANSACTION PROCESSING AND CONCURRENCY CONTROL   8
Introduction-Properties of Transaction- Serializability- Concurrency Control - Locking Mechanisms-Two Phase Commit Protocol-Dead lock.

UNIT IV   TRENDS IN DATABASE TECHNOLOGY   10
Overview of Physical Storage Media - Magnetic Disks - RAID - Tertiary storage - File Organization - Organization of Records in Files - Indexing and Hashing -Ordered Indices - B+ tree Index Files - B tree Index Files - Static Hashing - Dynamic Hashing - Introduction to Distributed Databases- Client server technology- Multidimensional and Parallel databases- Spatial and multimedia databases- Mobile and web databases- Data Warehouse-Mining- Data marts.

UNIT V   ADVANCED TOPICS   9
DATABASE SECURITY: Data Classification-Threats and risks - Database access Control - Types of Privileges -Cryptography- Statistical Databases.- Distributed Databases-Architecture-Transaction Processing-Data Warehousing and Mining-Classification-Association rules-Clustering-Information Retrieval- Relevance ranking-Crawling and Indexing the Web- Object Oriented Databases-XML Databases.

                                                                    TOTAL: 45 PERIODS
OUTCOMES:
At the end of the course, the student should be able to:
- Design Databases for applications.
- Use the Relational model, ER diagrams.
- Apply concurrency control and recovery mechanisms for practical problems.
- Design the Query Processor and Transaction Processor.
- Apply security concepts to databases.

CS6551   **COMPUTER NETWORKS**   **L T P C**
                                                                   3 0 0 3

OBJECTIVES:
The student should be made to:
- Understand the division of network functionalities into layers.
- Be familiar with the components required to build different types of networks
- Be exposed to the required functionality at each layer
- Learn the flow control and congestion control algorithms

UNIT I   FUNDAMENTALS & LINK LAYER   9
Building a network – Requirements - Layering and protocols - Internet Architecture – Network software – Performance ; Link layer Services - Framing - Error Detection - Flow control

UNIT II   MEDIA ACCESS & INTERNETWORKING   9
Media access control - Ethernet (802.3) - Wireless LANs – 802.11 - Bluetooth - Switching and bridging – Basic Internetworking (IP, CIDR, ARP, DHCP,ICMP)

UNIT III   ROUTING   9
Routing (RIP, OSPF, metrics) – Switch basics - Global Internet (Areas, BGP, IPv6), Multicast – addresses – multicast routing (DVMRP, PIM)

UNIT IV   TRANSPORT LAYER   9
Overview of Transport layer - UDP - Reliable byte stream (TCP) - Connection management - Flow control - Retransmission – TCP Congestion control - Congestion avoidance (DECbit, RED) – QoS – Application requirements

UNIT V   APPLICATION LAYER   9
Traditional applications -Electronic Mail (SMTP, POP3, IMAP, MIME) - HTTP – Web Services – DNS - SNMP

                                                          TOTAL: 45 PERIODS

OUTCOMES:
At the end of the course, the student should be able to:
- Identify the components required to build different types of networks
- Choose the required functionality at each layer for given application
- Identify solution for each functionality at each layer
- Trace the flow of information from one node to another node in the network

TEXT BOOK:
1. Larry L. Peterson, Bruce S. Davie, "Computer Networks: A Systems Approach", Fifth Edition, Morgan Kaufmann Publishers, 2011.

REFERENCES:
1. James F. Kurose, Keith W. Ross, "Computer Networking - A Top-Down Approach Featuring the Internet", Fifth Edition, Pearson Education, 2009.
2. Nader. F. Mir, "Computer and Communication Networks", Pearson Prentice Hall Publishers, 2010.
3. Ying-Dar Lin, Ren-Hung Hwang, Fred Baker, "Computer Networks: An Open Source Approach", Mc Graw Hill Publisher, 2011.
4. Behrouz A. Forouzan, "Data communication and Networking", Fourth Edition, Tata McGraw - Hill, 2011.

44

CS6659   ARTIFICIAL INTELLIGENCE   L T P C
                                                               3 0 0 3

OBJECTIVES:
The student should be made to:
- Study the concepts of Artificial Intelligence.
- Learn the methods of solving problems using Artificial Intelligence.
- Introduce the concepts of Expert Systems and machine learning.

UNIT I   INTRODUCTION TO AI AND PRODUCTION SYSTEMS   9
Introduction to AI-Problem formulation, Problem Definition -Production systems, Control strategies, Search strategies. Problem characteristics, Production system characteristics -Specialized production system- Problem solving methods - Problem graphs, Matching, Indexing and Heuristic functions -Hill Climbing-Depth first and Breath first, Constraints satisfaction - Related algorithms, Measure of performance and analysis of search algorithms.

UNIT II   REPRESENTATION OF KNOWLEDGE   9
Game playing - Knowledge representation, Knowledge representation using Predicate logic, Introduction to predicate calculus, Resolution, Use of predicate calculus, Knowledge representation using other logic-Structured representation of knowledge.

UNIT III   KNOWLEDGE INFERENCE   9
Knowledge representation -Production based system, Frame based system. Inference - Backward chaining, Forward chaining, Rule value approach, Fuzzy reasoning - Certainty factors, Bayesian Theory-Bayesian Network-Dempster - Shafer theory.

UNIT IV   PLANNING AND MACHINE LEARNING   9
Basic plan generation systems - Strips -Advanced plan generation systems – K strips -Strategic explanations -Why, Why not and how explanations. Learning- Machine learning, adaptive Learning.

UNIT V   EXPERT SYSTEMS   9
Expert systems - Architecture of expert systems, Roles of expert systems - Knowledge Acquisition – Meta knowledge, Heuristics. Typical expert systems - MYCIN, DART, XOON, Expert systems shells.

                                                       TOTAL: 45 PERIODS

OUTCOMES:
At the end of the course, the student should be able to:
- Identify problems that are amenable to solution by AI methods.
- Identify appropriate AI methods to solve a given problem.
- Formalise a given problem in the language/framework of different AI methods.
- Implement basic AI algorithms.
- Design and carry out an empirical evaluation of different algorithms on a problem formalisation, and state the conclusions that the evaluation supports.

TEXT BOOKS:
1. Kevin Night and Elaine Rich, Nair B., "Artificial Intelligence (SIE)", Mc Graw Hill- 2008.(Units-I,II,VI & V)
2. Dan W. Patterson, "Introduction to AI and ES", Pearson Education, 2007.(Unit-III)

REFERENCES:
1. Peter Jackson, "Introduction to Expert Systems", 3rd Edition, Pearson Education, 2007.
2. Stuart Russel and Peter Norvig "AI - A Modern Approach", 2nd Edition, Pearson Education 2007.
3. Deepak Khemani "Artificial Intelligence", Tata Mc Graw Hill Education 2013.
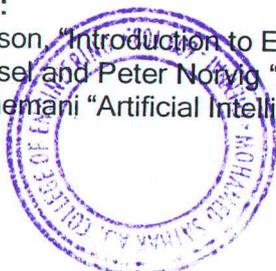
CS6701   CRYPTOGRAPHY AND NETWORK SECURITY   L T P C
                                                              3 0 0 3

OBJECTIVES:
The student should be made to:
- Understand OSI security architecture and classical encryption techniques.
- Acquire fundamental knowledge on the concepts of finite fields and number theory.
- Understand various block cipher and stream cipher models.
- Describe the principles of public key cryptosystems, hash functions and digital signature.

UNIT I   INTRODUCTION & NUMBER THEORY   10
Services, Mechanisms and attacks-the OSI security architecture-Network security model-Classical Encryption techniques (Symmetric cipher model, substitution techniques, transposition techniques, steganography).FINITE FIELDS AND NUMBER THEORY: Groups, Rings, Fields-Modular arithmetic-Euclid"s algorithm-Finite fields- Polynomial Arithmetic -Prime numbers-Fermat"s and Euler"s theorem-Testing for primality -The Chinese remainder theorem- Discrete logarithms.

UNIT II   BLOCK CIPHERS & PUBLIC KEY CRYPTOGRAPHY   10
Data Encryption Standard-Block cipher principles-block cipher modes of operation-Advanced Encryption Standard (AES)-Triple DES-Blowfish-RC5 algorithm. **Public key cryptography:** Principles of public key cryptosystems-The RSA algorithm-Key management - Diffie Hellman Key exchange-Elliptic curve arithmetic-Elliptic curve cryptography.

UNIT III   HASH FUNCTIONS AND DIGITAL SIGNATURES   8
Authentication requirement – Authentication function – MAC – Hash function – Security of hash function and MAC –MD5 - SHA - HMAC – CMAC - Digital signature and authentication protocols – DSS – El Gamal – Schnorr.

UNIT IV   SECURITY PRACTICE & SYSTEM SECURITY   8
Authentication applications – Kerberos - X.509 Authentication services - Internet Firewalls for Trusted System: Roles of Firewalls - Firewall related terminology- Types of Firewalls - Firewall designs - SET for E-Commerce Transactions. Intruder – Intrusion detection system – Virus and related threats – Countermeasures – Firewalls design principles – Trusted systems – Practical implementation of cryptography and security.

UNIT V   E-MAIL, IP & WEB SECURITY   9
E-mail Security: Security Services for E-mail-attacks possible through E-mail - establishing keys privacy-authentication of the source-Message Integrity-Non-repudiation-Pretty Good Privacy-S/MIME. **IPSecurity:** Overview of IPSec - IP and IPv6-Authentication Header-Encapsulation Security Payload (ESP)-Internet Key Exchange (Phases of IKE, ISAKMP/IKE Encoding). **Web Security:** SSL/TLS Basic Protocol-computing the keys- client authentication-PKI as deployed by SSLAttacks fixed in v3-Exportability-Encoding-Secure Electronic Transaction (SET).

                                                    TOTAL: 45 PERIODS

OUTCOMES:
Upon Completion of the course, the students should be able to:
- Compare various Cryptographic Techniques
- Design Secure applications
- Inject secure coding in the developed applications

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76

CS6008   HUMAN COMPUTER INTERACTION   L T P C
                                                                       3 0 0 3

OBJECTIVES:
The student should be made to:
- Learn the foundations of Human Computer Interaction.
- Be familiar with the design technologies for individuals and persons with disabilities.
- Be aware of mobile HCI.
- 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.

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
Cognitive models –Socio-Organizational issues and stake holder 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.

UNIT V   WEB INTERFACE DESIGN   9
Designing Web Interfaces – Drag & Drop, Direct Selection, Contextual Tools, Overlays, Inlays and Virtual Pages, Process Flow. Case Studies.

                                   L: 45, T: 0, TOTAL: 45 PERIODS

OUTCOMES:
Upon completion of the course, the student 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", 3 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).

105

| CS6601 | DISTRIBUTED SYSTEMS | L T P C |
| | | 3 0 0 3 |

OBJECTIVES:
The student should be made to:
- Understand foundations of Distributed Systems.
- Introduce the idea of peer to peer services and file system.
- Understand in detail the system level and support required for distributed system.
- Understand the issues involved in studying process and resource management.

UNIT I   INTRODUCTION   **7**

Examples of Distributed Systems-Trends in Distributed Systems - Focus on resource sharing - Challenges. **Case study:** World Wide Web.

UNIT II   COMMUNICATION IN DISTRIBUTED SYSTEM   **10**

System Model – Inter process Communication - the API for internet protocols – External data representation and Multicast communication. **Network virtualization:** Overlay networks. **Case study:** MPI **Remote Method Invocation And Objects:** Remote Invocation – Introduction - Request-reply protocols - Remote procedure call - Remote method invocation. **Case study:** Java RMI - Group communication - Publish-subscribe systems - Message queues - Shared memory approaches - Distributed objects - Case study: Enterprise Java Beans -from objects to components.

UNIT III   PEER TO PEER SERVICES AND FILE SYSTEM   **10**

Peer-to-peer Systems – Introduction - Napster and its legacy - Peer-to-peer – Middleware - Routing overlays. **Overlay case studies:** Pastry, Tapestry- Distributed File Systems -Introduction - File service architecture - Andrew File system. **File System:** Features-File model -File accessing models - File sharing semantics **Naming:** Identifiers, Addresses, Name Resolution - Name Space Implementation – Name Caches – LDAP.

UNIT IV   SYNCHRONIZATION AND REPLICATION   **9**

Introduction - Clocks, events and process states - Synchronizing physical clocks- Logical time and logical clocks - Global states - Coordination and Agreement - Introduction - Distributed mutual exclusion – Elections – Transactions and Concurrency Control- Transactions -Nested transactions - Locks - Optimistic concurrency control - Timestamp ordering - Atomic Commit protocols -Distributed deadlocks – Replication – Case study – Coda.

UNIT V   PROCESS & RESOURCE MANAGEMENT   **9**

Process Management: Process Migration: Features, Mechanism - Threads: Models, Issues, Implementation. **Resource Management:** Introduction- Features of Scheduling Algorithms -Task Assignment Approach – Load Balancing Approach – Load Sharing Approach.

TOTAL: 45 PERIODS

OUTCOMES:
At the end of the course, the student should be able to:
- Discuss trends in Distributed Systems.
- Apply network virtualization.
- Apply remote method invocation and objects.
- Design process and resource management systems.

TEXT BOOK:
1. George Coulouris, Jean Dollimore and Tim Kindberg, "Distributed Systems Concepts and Design", Fifth Edition, Pearson Education, 2012.

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CS6501   INTERNET PROGRAMMING   **L T P C**
3 1 0 4

OBJECTIVES:
The student should be made to:
- Learn Java Programming.
- Understand different Internet Technologies.
- Be exposed to java specific web services architecture.

UNIT I   JAVA PROGRAMMING   9
An overview of Java – Data Types – Variables and Arrays – Operators – Control Statements – Classes – Objects – Methods – Inheritance - Packages – Abstract classes – Interfaces and Inner classes - Exception handling - Introduction to Threads - Multithreading - String handling – Streams and I/O – Applets.

UNIT II   WEBSITES BASICS, HTML 5, CSS 3, WEB 2.0   8
Web 2.0: Basics-RIA Rich Internet Applications - Collaborations tools - **Understanding websites and web servers:** Understanding Internet – Difference between websites and web server- Internet technologies Overview –Understanding the difference between internet and intranet; **HTML and CSS:** HTML 5.0 , XHTML, CSS 3.

UNIT III   CLIENT SIDE AND SERVER SIDE PROGRAMMING   11
Java Script: An introduction to JavaScript-JavaScript DOM Model-Date and Objects,-Regular Expressions- Exception Handling-Validation-Built-in objects-Event Handling- DHTML with JavaScript. **Servlets:** Java Servlet Architecture- Servlet Life Cycle- Form GET and POST actions- Session Handling- Understanding Cookies- Installing and Configuring Apache Tomcat Web Server;- DATABASE CONNECTIVITY: JDBC perspectives, JDBC program example - **JSP:** Understanding Java Server Pages-JSP Standard Tag Library(JSTL)-Creating HTML forms by embedding JSP code.

UNIT IV   PHP and XML   8
An introduction to PHP: PHP- Using PHP- Variables- Program control- Built-in functions-Connecting to Database – Using Cookies-Regular Expressions; **XML:** Basic XML- Document Type Definition- XML Schema DOM and Presenting XML, XML Parsers and Validation, XSL and XSLT Transformation, News Feed (RSS and ATOM).

UNIT V   INTRODUCTION TO AJAX and WEB SERVICES   9
AJAX: Ajax Client Server Architecture-XML Http Request Object-Call Back Methods; **Web Services:** Introduction- Java web services Basics – Creating, Publishing ,Testing and Describing a Web services (WSDL)-Consuming a web service, Database Driven web service from an application – SOAP.

                                    TOTAL (L:45+T:15): 60 PERIODS

OUTCOMES:
At the end of the course, the student should be able to:
- Implement Java programs.
- Create a basic website using HTML and Cascading Style Sheets.
- Design and implement dynamic web page with validation using JavaScript objects and by applying different event handling mechanisms.
- Design rich client presentation using AJAX.
- Design and implement simple web page in PHP, and to present data in XML format.
- Design and implement server side programs using Servlets and JSP.

54

CS6402   DESIGN AND ANALYSIS OF ALGORITHMS   L T P C
                                                              3 0 0 3

OBJECTIVES:
The student should be made to:
- Learn the algorithm analysis techniques.
- Become familiar with the different algorithm design techniques.
- Understand the limitations of Algorithm power.

UNIT I   INTRODUCTION   9
Notion of an Algorithm – Fundamentals of Algorithmic Problem Solving – Important Problem Types – Fundamentals of the Analysis of Algorithm Efficiency – Analysis Framework – Asymptotic Notations and its properties – Mathematical analysis for Recursive and Non-recursive algorithms.

UNIT II   BRUTE FORCE AND DIVIDE-AND-CONQUER   9
Brute Force - Closest-Pair and Convex-Hull Problems-Exhaustive Search - Traveling Salesman Problem - Knapsack Problem - Assignment problem.
Divide and conquer methodology – Merge sort – Quick sort – Binary search – Multiplication of Large Integers – Strassen"s Matrix Multiplication-Closest-Pair and Convex-Hull Problems.

UNIT III   DYNAMIC PROGRAMMING AND GREEDY TECHNIQUE   9
Computing a Binomial Coefficient – Warshall"s and Floyd" algorithm – Optimal Binary Search Trees – Knapsack Problem and Memory functions. Greedy Technique- Prim"s algorithm- Kruskal's Algorithm-Dijkstra's Algorithm-Huffman Trees.

UNIT IV   ITERATIVE IMPROVEMENT   9
The Simplex Method-The Maximum-Flow Problem – Maximm Matching in Bipartite Graphs- The Stable marriage Problem.

UNIT V   COPING WITH THE LIMITATIONS OF ALGORITHM POWER   9
Limitations of Algorithm Power-Lower-Bound Arguments-Decision Trees-P, NP and NP-Complete Problems--Coping with the Limitations - Backtracking – n-Queens problem – Hamiltonian Circuit Problem – Subset Sum Problem-Branch and Bound - Assignment problem – Knapsack Problem – Traveling Salesman Problem- Approximation Algorithms for NP – Hard Problems – Traveling Salesman problem – Knapsack problem.

                                                    TOTAL: 45 PERIODS
OUTCOMES:
At the end of the course, the student 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 BOOK:
1. Anany Levitin, "Introduction to the Design and Analysis of Algorithms", Third Edition, Pearson Education, 2012.

REFERENCES:
1. Thomas H.Cormen, Charles E.Leiserson, Ronald L. Rivest and Clifford Stein, "Introduction to Algorithms", Third Edition, PHI Learning Private Limited, 2012.

46

CS6704   RESOURCE MANAGEMENT TECHNIQUES   L T P C
                                                                            3 0 0 3

OBJECTIVES:
The student should be made to:
- Be familiar with resource management techniques.
- Learn to solve problems in linear programming and Integer programming.
- Be exposed to CPM and PERT.

UNIT I   LINEAR PROGRAMMING   9
Principal components of decision problem – Modeling phases – LP Formulation and graphic solution – Resource allocation problems – Simplex method – Sensitivity analysis.

UNIT II   DUALITY AND NETWORKS   9
Definition of dual problem – Primal – Dual relation ships – Dual simplex methods – Post optimality analysis – Transportation and assignment model - Shortest route problem.

UNIT III   INTEGER PROGRAMMING   9
Cutting plan algorithm – Branch and bound methods, Multistage (Dynamic) programming.

UNIT IV   CLASSICAL OPTIMISATION THEORY: 9
Unconstrained external problems, Newton – Ralphson method – Equality constraints – Jacobean methods – Lagrangian method – Kuhn – Tucker conditions – Simple problems.

UNIT V   OBJECT SCHEDULING: 9
Network diagram representation – Critical path method – Time charts and resource leveling - PERT.

                                                            TOTAL: 45 PERIODS

OUTCOMES:
Upon Completion of the course, the students should be able to:
- Solve optimization problems using simplex method.
- Apply integer programming and linear programming to solve real-life applications.
- Use PERT and CPM for problems in project management

TEXT BOOK:
1. H.A. Taha, "Operation Research", Prentice Hall of India, 2002.

REFERENCES:
1. Paneer Selvam, „Operations Research", Prentice Hall of India, 2002
2. Anderson „Quantitative Methods for Business", 8th Edition, Thomson Learning, 2002.
3. Winston „Operation Research", Thomson Learning, 2003.
4. Vohra, „Quantitative Techniques in Management", Tata Mc Graw Hill, 2002.
5. Anand Sarma, „Operation Research", Himalaya Publishing House, 2003.

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CS6502   OBJECT ORIENTED ANALYSIS AND DESIGN   L T P C
                                                                         3 0 0 3

OBJECTIVES:
The student should be made to:
- Learn the basics of OO analysis and design skills.
- Learn the UML design diagrams.
- Learn to map design to code.
- Be exposed to the various testing techniques.

UNIT I   UML DIAGRAMS   9
Introduction to OOAD – Unified Process – UML diagrams – Use Case – Class Diagrams- Interaction Diagrams - State Diagrams – Activity Diagrams - Package, component and Deployment Diagrams.

UNIT II   DESIGN PATTERNS   9
GRASP: Designing objects with responsibilities - Creator - Information expert - Low Coupling - High Cohesion - Controller - Design Patterns - creational - factory method - structural - Bridge - Adapter - behavioral – Strategy – observer.

UNIT III   CASE STUDY   9
Case study – the Next Gen POS system, Inception -Use case Modeling - Relating Use cases – include, extend and generalization - Elaboration - Domain Models - Finding conceptual classes and description classes - Associations - Attributes - Domain model refinement - Finding conceptual class Hierarchies - Aggregation and Composition.

UNIT IV   APPLYING DESIGN PATTERNS   9
System sequence diagrams - Relationship between sequence diagrams and use cases Logical architecture and UML package diagram – Logical architecture refinement - UML class diagrams - UML interaction diagrams - Applying GoF design patterns.

UNIT V   CODING AND TESTING   9
Mapping design to code – Testing: Issues in OO Testing - Class Testing – OO Integration Testing - GUI Testing – OO System Testing.

TOTAL: 45 PERIODS

OUTCOMES:
At the end of the course, the student should be able to:
- Design and implement projects using OO concepts.
- Use the UML analysis and design diagrams.
- Apply appropriate design patterns.
- Create code from design.
- Compare and contrast various testing techniques.

TEXT BOOK:
1. Craig Larman, "Applying UML and Patterns: An Introduction to Object-Oriented Analysis and Design and Iterative Development", Third Edition, Pearson Education, 2005.

REFERENCES:
1. Simon Bennett, Steve Mc Robb and Ray Farmer, "Object Oriented Systems Analysis and Design Using UML", Fourth Edition, Mc-Graw Hill Education, 2010.
2. Erich Gamma, and Richard Helm, Ralph Johnson, John Vlissides, "Design patterns: Elements of Reusable Object-Oriented Software", Addison-Wesley, 1995.
3. Martin Fowler, "UML Distilled: A Brief Guide to the Standard Object Modeling Language", Third edition, Addison Wesley, 2003.
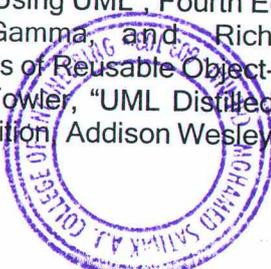
55

CS6504   COMPUTER GRAPHICS   L T P C
                                                                     3 0 0 3
OBJECTIVES:
The student should be made to:
- Gain knowledge about graphics hardware devices and software used.
- Understand the two dimensional graphics and their transformations.
- Understand the three dimensional graphics and their transformations.
- Appreciate illumination and color models.
- Be familiar with understand clipping techniques.

UNIT I   INTRODUCTION   9
Survey of computer graphics, Overview of graphics systems – Video display devices, Raster scan systems, Random scan systems, Graphics monitors and Workstations, Input devices, Hard copy Devices, Graphics Software; Output primitives - points and lines, line drawing algorithms, loading the frame buffer, line function; circle and ellipse generating algorithms; Pixel addressing and object geometry, filled area primitives.

UNIT II   TWO DIMENSIONAL GRAPHICS   9
Two dimensional geometric transformations - Matrix representations and homogeneous coordinates, composite transformations; Two dimensional viewing - viewing pipeline, viewing coordinate reference frame; widow-to-viewport coordinate transformation, Two dimensional viewing functions; clipping operations – point, line, and polygon clipping algorithms.

UNIT III   THREE DIMENSIONAL GRAPHICS   10
Three dimensional concepts; Three dimensional object representations - Polygon surfaces- Polygon tables- Plane equations - Polygon meshes; Curved Lines and surfaces, Quadratic surfaces; Blobby objects; Spline representations – Bezier curves and surfaces -B-Spline curves and surfaces. TRANSFORMATION AND VIEWING: Three dimensional geometric and modeling transformations – Translation, Rotation, Scaling, composite transformations; Three dimensional viewing – viewing pipeline, viewing coordinates, Projections, Clipping; Visible surface detection methods.

UNIT IV   ILLUMINATION AND COLOUR MODELS   7
Light sources - basic illumination models – halftone patterns and dithering techniques; Properties of light - Standard primaries and chromaticity diagram; Intuitive colour concepts - RGB colour model - YIQ colour model - CMY colour model - HSV colour model - HLS colour model; Colour selection.

UNIT V   ANIMATIONS & REALISM   10
ANIMATION GRAPHICS: Design of Animation sequences - animation function - raster animation - key frame systems - motion specification -morphing - tweening. **COMPUTER GRAPHICS REALISM:** Tiling the plane – Recursively defined curves – Koch curves – C curves – Dragons – space filling curves - fractals – Grammar based models – fractals – turtle graphics – ray tracing.

                                                          TOTAL: 45 PERIODS
OUTCOMES:
At the end of the course, the student should be able to:
- Design two dimensional graphics.
- Apply two dimensional transformations.
- Design three dimensional graphics.
- Apply three dimensional transformations.
- Apply Illumination and color models.
- Apply clipping techniques to graphics.
- Design animation sequences.

IT6502   **DIGITAL SIGNAL PROCESSING**   L T P C
                                                                          3 1 0 4

OBJECTIVES:
- To introduce discrete Fourier transform and its applications.
- To teach the design of infinite and finite impulse response filters for filtering undesired signals.
- To introduce signal processing concepts in systems having more than one sampling frequency.

UNIT I   SIGNALS AND SYSTEMS   9
Basic elements of DSP - concepts of frequency in Analog and Digital Signals - sampling theorem - Discrete - time signals, systems - Analysis of discrete time LTI systems - Z transform - Convolution - Correlation.

UNIT II   FREQUENCY TRANSFORMATIONS   9
Introduction to DFT - Properties of DFT - Circular Convolution - Filtering methods based on DFT - FFT Algorithms - Decimation - in - time Algorithms, Decimation - in - frequency Algorithms - Use of FFT in Linear Filtering - DCT - Use and Application of DCT.

UNIT III   IIR FILTER DESIGN   9
Structures of IIR - Analog filter design - Discrete time IIR filter from analog filter - IIR filter design by Impulse Invariance, Bilinear transformation, Approximation of derivatives - (LPF, HPF, BPF, BRF) filter design using frequency translation.

UNIT IV   FIR FILTER DESIGN   9
Structures of FIR - Linear phase FIR filter - Fourier Series - Filter design using windowing techniques (Rectangular Window, Hamming Window, Hanning Window), Frequency sampling techniques

UNIT V   FINITE WORD LENGTH EFFECTS IN DIGITAL FILTERS   9
Binary fixed point and floating point number representations - Comparison - Quantization noise - truncation and rounding - quantization noise power- input quantization error- coefficient quantization error - limit cycle oscillations-dead band- Overflow error-signal scaling.

                                        TOTAL (L:45+T:15): 60 PERIODS

OUTCOMES:
Upon completion of the course, students will be able to:
- Perform frequency transforms for the signals.
- Design IIR and FIR filters.
- Finite word length effects in digital filters

TEXT BOOK:
1. John G. Proakis and Dimitris G.Manolakis, "Digital Signal Processing – Principles, Algorithms & Applications", Fourth Edition, Pearson Education, Prentice Hall, 2007.

REFERENCES:
1. Emmanuel C.Ifeachor, and Barrie.W.Jervis, "Digital Signal Processing", Second Edition, Pearson Education, Prentice Hall, 2002.
2. Sanjit K. Mitra, "Digital Signal Processing – A Computer Based Approach", Third Edition, Tata Mc Graw Hill, 2007.
3. A.V.Oppenheim, R.W. Schafer and J.R. Buck, Discrete-Time Signal Processing, 8th Indian Reprint, Pearson, 2004.
4. Andreas Antoniou, "Digital Signal Processing", Tata McGraw Hill, 2006.

TWO WHEELER SAFETY DETECTION SYSTEM
USING MACHINE LEARNING

A PROJECT REPORT

Submitted by

ARUN PRASANTH A.P   **(311816104006)**

SULTHAN MOHAIDEEN N.K (311816104035)

in partial fulfillment for the award of the degree

of

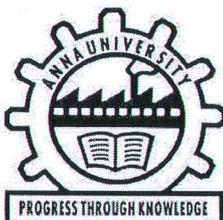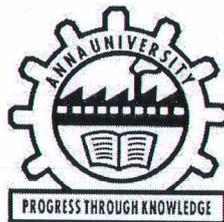## BACHELOR OF ENGINEERING

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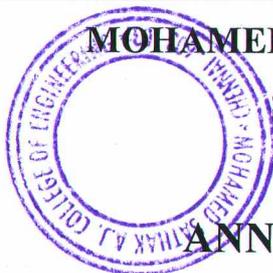
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APRIL 2020
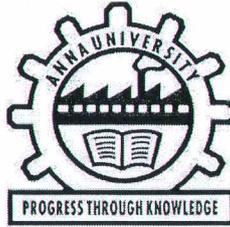
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Certified that this project report titled "TWO WHEELER SAFETY DETECTION SYSTEM USING MACHINE LEARNING" is the bonafide work of "ARUN PRASANTH A.P (311816104006), SULTHAN MOHAIDEEN N.K (311816104035)" ,who carried out the project work under my supervision.

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INTERNAL EXAMINAR

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ABSTRACT

To make sure the security measures, The helmet is that the motorcyclist's main protection. Most countries required to wear the helmet by the motorcyclist. But, many of us did not obey the law for various reasons. So, we've developed a project especially for motorcyclists who aren't wearing a helmet. As per idea detecting the non-helmet riders in surveillance camera footage using YOLO V3. Our base YOLO model procedures pictures progressively at 45 frames for each second. It detects the low-resolution images effectively with good accuracy and speed. By using our dataset for this model, we picked an honest picture and classified dataset. A smaller version of the network. Fast YOLO processes an astounding 155 frames per second while still achieving double the Maximum A Posteriori of other real-time detectors.

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CONCLUSION

This project refers to the detection of motorcycle riders with helmet and without helmet by yolov3 detection algorithm. From this yolo module low resolution objects are used to train the module, we obtain average prediction rate of 0.5 in low resolution images. We also obtained faster detection of objects at the average rate of 0.222 seconds. In future this model will be improved the effective detection of rider helmets from the fast moving vehicles. In the next work, we will train large amount of dataset for better detection system from live video footage.

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PRIVACY PRESERVING SIMILAR BASE
TEXT RETRIEVAL THROUGH THE BLIND
STORAGE

A PROJECT REPORT

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in partial fulfillment for the award of the degree

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Certified that this project report **"PRIVACY PRESERVING SIMILAR BASE TEXT RETRIEVAL THROUGH THE BLIND STORAGE"** is the bonafide work of **SANJAY KUMAR.R (311816104028), SAJID AHMED.S (311816104026)** who carried out the project work under my supervision.

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INTERNAL EXAMINER

EXTERNAL EXAMINER

ii

ABSTRACT

Cloud computing has emerging as a promising pattern for data outsourcing and high-quality data services. However, concerns of sensitive information on cloud potentially cause privacy problems. Data encryption protects data security to some extent, but at the cost of compromised efficiency. Searchable symmetric encryption (SSE) allows retrieval of encrypted data over cloud. In this paper, we focus on addressing data privacy issues using SSE. For the first time, we formulate the privacy issue from the aspect of similarity relevance and scheme robustness. We observe that server-side ranking based on order-preserving encryption (OPE) inevitably leaks data privacy. To eliminate the leakage, we propose a two-round searchable encryption (TRSE) scheme that supports top-k multi keyword retrieval. In TRSE, we employ a vector space model and holomorphic encryption. The vector space model helps to provide sufficient search accuracy, and the holomorphic encryption enables users to involve in the ranking while the majority of computing work is done on the server side by operations only on cipher text. As a result, information leakage can be eliminated and data security is ensured. Thorough security and performance analysis show that the proposed scheme guarantees high security and practical efficiency.

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Conclusion

Motivate and solve the problem of secure multi keyword top-k retrieval over encrypted cloud data. We define similarity relevance and scheme robustness. Based on OPE invisibly leaking sensitive information, Devise a server-side ranking SSE scheme. We then propose a TRSE scheme employing the fully holomorphic encryption, which fulfills the security requirements of multikeyword top-k retrieval over the encrypted cloud data. By security analysis, we show that the proposed scheme guarantees data privacy.

PUBLIC POLLING: DYNAMIC DATA ANALYSIS WITH MACHINE LEARNING APPROACH FOR DATA POLARITY USING SENTIMENT ANALYSIS

A PROJECT REPORT

Submitted by

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SABIRA MARIYAM.B   **(311816104025)**

in partial fulfillment for the award of the degree

of

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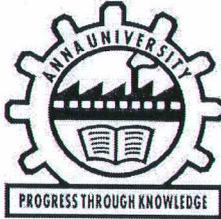
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BONAFIDE CERTIFICATE

Certified that this project report "**PUBLIC POLLING: DYNAMIC DATA ANALYSIS WITH MACHINE LEARNING APPROACH FOR DATA POLARITY USING SENTIMENT ANALYSIS**" is the bonafide work of **AFREEN BEGUM.K (311816104003), SABIRA MARIYAM.B (311816104025)** who carried out the project work under my supervision.

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ABSTRACT

In the Existing system, Sentimental analysis is an area in text mining where opinion of people can be analyzed and classified into positive, negative or neutral. In the Proposed system. The sentiments of the tweets that are tweeted on a twitter evaluated based on feature selection of each score words. In order to select the best features Naive Bayes Classifier (NBC) is used for training and testing the features of a words and also evaluating the sentiment polarity of each tweets. In the Modification process, Twitter like Application is created and users Tweets are processed. We are implementing Big Data in this Project. Users Tweets are the input to the Big Data HDFS System. Data are stored in the Data Nodes. Index is maintained in the Name Node. Tweets are clustered and classified based on Keywords extracted. Tweets are analyzed using Sentiment Analysis and Positive & Negative Tweets are classified.

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CONCLUSION

In this project, we have to implement the analyze the user tweets in social network like twitter, face book etc. Every user posts the tweets about product, in our project analyses the all tweets using sentiment analyze technique. So easily will classify the positive, negative reviews of the product so people easily will identify which one is the best product. Map & Reduce technique is also implemented to this project.

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-----THREE FACTOR DATA SECURITY PROTECTION MECHANISM FOR CLOUD STORAGE SYSTEM-----

A PROJECT REPORT

Submitted by

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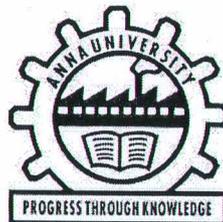
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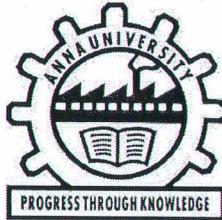
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INTERNAL EXAMINER

EXTERNAL EXAMINER

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ABSTRACT

In this paper we propose a three-factor data security protection mechanism for cloud storage system. The first factor is the public and private keys of each user. The second factor is the secret key which is sent from the cloud and the third factor is a security device. This system provides a way to send the encrypted data to a receiver through a cloud storage server. Initially the sender encrypts the data using receiver's public key and in cloud it is again encrypted using an AI program which is automatically performed in cloud. The receiver needs three things in order to decrypt the data, the security device, the secret key and his own private key. Decryption of data is not possible without either piece. Moreover, if security device is lost or stolen, it is revoked. When any unauthorized access is detected, the cloud server automatically changes the encryption algorithm. This process is not known to the sender. This enhances the security of the existing system

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CONCLUSION

Various techniques are available to provide security for cloud storage data. Among them, three-Factor Data Security Protection mechanism only provides confidentiality of the data and revocability for cloud data by using secret key and unique personal device. The efficiency and security analysis show that the system is secure as well as practically implemented.

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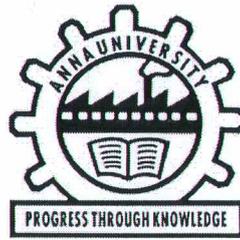
DYNAMIC DETECTION OF MULTI ATTACKS IN CLOUD ENVIRONMENT USING BIG DATA ANALYSIS TO ENSURE CYBER SECURITY

A PROJECT REPORT

Submitted by

TABASSUM HAJIRA S - 311816104038

In partial fulfillment for the award of the degree

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22. 09. 2020.

Submitted for the practical examination held on T.........................
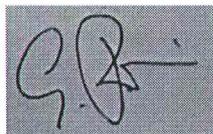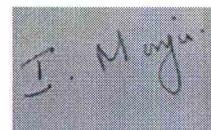
INTERNAL EXAMINER

EXTERNAL EXAMINER

ABSTRACT

In the Existing system, The data generated is a reflection of the environment it is produced out of, thus we can use the data we get out of systems to figure out the inner workings of that system. This has become an important feature in cyber security where the goal is to protect assets. Thus, we are implementing a system to identify the network traffic occurred by attackers and identify the attackers who is attacking the server. We are implementing a Big Data based centralized log analysis system to identify the network trafficoccurred by attackers through DDOS, SQL Injectionand Bruce Force attack. The log file is automatically transmitted to the centralized cloud server and big data is initiated for analysis process.

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CONCLUSION

1. Thus by using the data generated in terms of log file for resources, we analyze it and use the results to enhance the security and stability of the resource in cloud environment

2. We also implemented real-time analysis of the data so that we are securing the resources in terms of its high availability by avoiding unnecessary traffics of end-user dynamically

3. We prevent the system from same type of violence by taking corrective actions dynamically, by blocking the IP address of the intruders at the same time

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CRACK DETECTION - BASED CONVOLUTIONAL NEURAL NETWORKS

A PROJECT REPORT

Submitted by

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S.Salim Malik   (311816104027)

in partial fulfillment for the award of the degree

of

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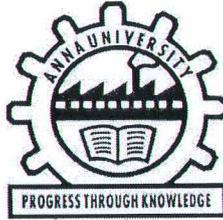
in

COMPUTER SCIENCE AND ENGINEERING

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APRIL 2020
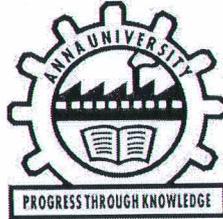
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INTERNAL EXAMINER

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ABSTRACT

Crack is one of important damages on real concrete surface. The visual inspection that depends on inspectors, a primary method to detect cracks, is laborious and time-consuming in practical operation. Fortunately, machine learning techniques make the crack detection more automated to some extent. However, the extracting of features is certainly necessary when image processing techniques detect crack in an image. As a result, the usage of image processing techniques is also limited, since images taken on real concrete surface are influenced by some noises caused by lighting, blur, and so on.

The convolutional neural networks (CNNs) can learn the features of images automatically instead of extracting features, and therefore the CNNs will not be influenced by the noises. A convolutional neural network (CNN) used to detect crack was designed through fine-turning an existed CNN architecture. In order to train the CNN, image datasets needed be built firstly. A large number of images were taken nearly 45,000 from real concrete surface using a smartphone, cropped into small images, classified. A CNN classifier used to detect crack can be obtained by training the CNN according to those built datasets. Through integrating the trained CNN classifier into a smartphone application or drone or a camera, the detection of crack in an image can be implemented automatically. The results illustrate that the proposed method shows high accuracy and robust performance and can indeed detect crack on real concrete surface
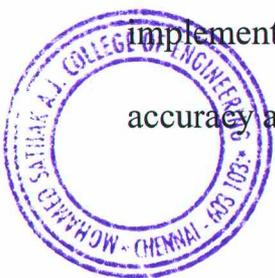
CONCLUSION

A convolution neural networks-based approach to detect cracks is proposed in this paper. A CNN used for crack detection is designed through modifying the Google Net. A large number of images needed for CNN training, validation and testing are collected using a Smartphone. Then those crack images are cropped into small images with 256×256 pixel resolutions to build a databank. A total of 60000 small images for building training and validation sets are included in the databank. The CNN is trained using the datasets and recorded the highest validation accuracy of 99.39%. It is concluded that the proposed method can detect cracks indeed, and the created Smartphone application make the crack detection conveniently. The proposed approach has been evaluated on various images, and can successfully extract visible cracks from the background of images captured

INTUITIVE CHATBOT USING OPEN AI AND RASA FOR STUDENTS

A PROJECT REPORT

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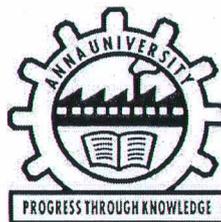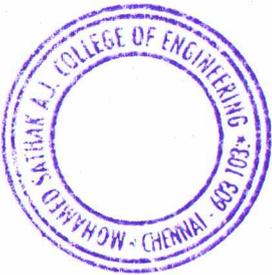
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INTERNAL EXAMINER

EXTERNAL EXAMINER

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ABSTRACT:

In today's world, we observe that there are so many types of students. In a class of students, there is always a topper with 100% of the score and a slow learner who can't make it to the average. Why is there always a difference? Why can't all students get 100%? To all the bunch of questions out there, it is one line answer- "Students can't clearly understand." This paper is focused on the design and implementation of "CLARA." This project will analyze the student's needs and achieve a clear and simple explanation so that the student is left with no doubt and the conversation will remain as real as possible. The AI technologies have grown a lot in recent years and there are many AI-powered products to the consumers but still, not everything that is available in the market is free or cost-effective. So our project is to create an AI assistant which is multipurpose and modular which can be made to run on any devices and also they are lightweight architecture and can be even ready to run on very low powered architectures. This can be a very cost-effective replacement for the current AI assistant that is available in the market. This kind of Artificial intelligence systems can be used to assist visually challenged humans as well as mentally challenged students.

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CONCLUSION

The Model creates a complex integrity with the users when the users interact with the AI assistant. This Project is mainly to create easily accessible and multipurpose AI assistants. Which can be used to create Iot systems, Assistants for physically challenged persons and take care of the Home system and other much automation based on the visual based processing. So this system can be used as Home assistant mainly for now which is explained in this Project.

The applications can be pretty large and can be replaced for many systems such as Alexa and Google where they are paid versions and need subscriptions to do most of the things right now such as home control and parental care etc. and also the system contains a UI where the user can train their AI to make it learn new thingsevery time.

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CHATBOT AGRI EXPERT SYSTEM

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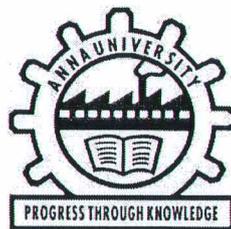
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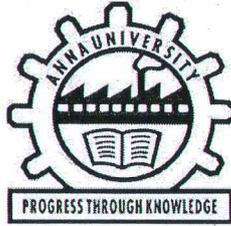
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ABSTRACT

Artificial Intelligence and Machine Learning are driving IT industry to new landscape. This system "The Chabot" overcomes this problem and provides farmers the better opportunity to obtain the desired information and to scale up with upcoming market trends and technologies in a user friendly manner. ChatBot is a open source conversational AI assistant, through which the users can communicate with the bot as if they are conversing with humans. The focus is on developing the bot in a more intellectual way, that it can even recognize not so well grammatically defined sentences, misspelled words, incomplete phrases, etc.,. This can help people to converse easily with the bot, since this system uses the Natural Language Understanding technique to parse the user queries, identify the key words, match them with Knowledge Base and respond with the accurate results. To make the responses more understandable, the responses are generated using classification algorithms and produce textual responses so that it can be easily perceived by the users.

This project module was made RASA and Django framework. Django handle the front end of the project then receive the response message from the RASA framework. RASA handle the backend process of the chatbot which process the query from the users. By using the endpoints and webhooks chatbot can send the response message to Django. All the conversation between the chatbot and user are stored in the Mongodb database.

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CONCLUSION

This system helps farmers to query about the agriculture, get the response in text and also helps in predicting the future data of price, so that they can plan their activities. The future enhancement can be done by giving the response in their regional language.

The use of such a framework is not limited to chat applications only. The true potential lies with information systems that could be built into the existing framework due to the distributed nature. Depending on the requirements of the integration, the necessary additional components can be introduced on the artificial brain level.

Chatbots are hot software in the enterprise, but to maintain longevity and relevance, developers need to take a look at the barriers to entry, interface options and NLP issues.

The future of chatbots is that businesses will automate simple payments and allow users to pay directly over live chat or Facebook Messenger apps. The instant process makes the customer happy and improves customer satisfaction.
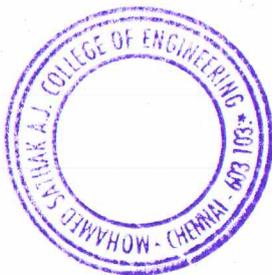
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OPINION MINING FOR IDENTIFYING SUSPICIOUS USERS

A PROJECT REPORT

submitted by

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In partialfulfillment of the award of the degree

of

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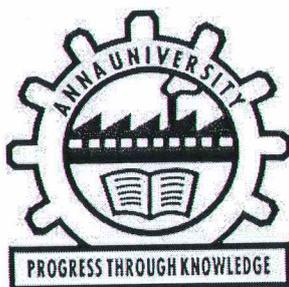
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Project viva-voce held on 22.09.2020

INTERNAL EXAMINAR   *EXTERNAL EXAMINAR*

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2

ABSTRACT

Social Network is a service used by large number of individuals to interact with other persons through online cafe or blogs. Since social network is becoming so popular, it has gained the attention of many researchers. Usually people interact with each other by posting their opinions (comments) in the form of text in blogs. There are many mechanisms available for analyzing the meaning of such text. In our project, the related work used is Linguistic Inquiry and Word Count (LIWC). LIWC is used to analyze the text and count the words and categorize the persons into male or female and young or old. This method has certain limitations such as its accuracy rate to the reality is only 67% .We

Used opini Opinion Mining is used to analyze the text and provide the results numerically, so that the user can understand what the writer thinks without reading the text. Sentiment Classification is one of the techniques that uses opinion mining. Sentiment classification technique is used to determine the attitude of the writer with respect to any topic. In our project, this technique is used to reveal the identities of distrusted users in blogs.
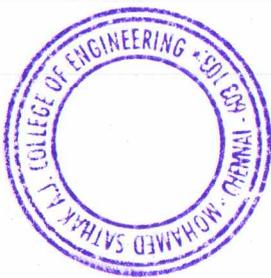
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4

CONCLUSION

In this study we presented a framework for identifying Distrusted users in Social Networking sites by using user-generated text content such as comments. The blog is created to make the people interact with one another efficiently. Then the ties between them are identified and categorized as Strong tie and Weak tie .If they are strong tie, then they are allowed to post the comments. If they are weak tie, a degree is set and their comments are extracted by using Tokenize and Stop word removal technique. Then the result obtained are further processed by stemming technique. The resultant words obtained from stemming Process is matched with LIWC Dictionary. If a match occurs, then it is considered as illicit words. The related words for the illicit words found in pattern matching will be searched in a database. Related search degree is set based on the count of related words. The value for eachcomment is calculated based on relation degree, no of illicit words in the comments and related search degree. Then the illicit comment is identified. In the future we shall combine different feature types like the text features and the image features which can improve the performance of the overall system.

Routing Analysis and Trail Tracking on Isolated Non-Network Area With Gyro Techniques

A PROJECT REPORT

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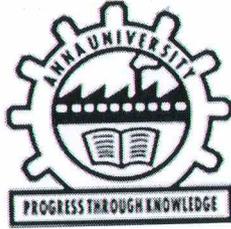## BACHELOR OF ENGINEERING

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APRIL 2020

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INTERNAL EXAMINER

EXTERNAL EXAMINER
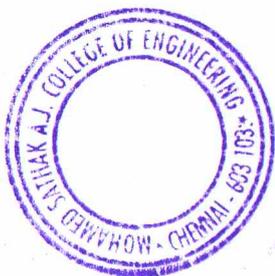
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ABSTRACT

Mobile phone applications such as pedometers are used for showing geographical directions. These applications are helpful for users in isolated area; also these applications are used by trekkers to find geographical directions. In existing system, the application requires the use of mobile data, network tower. The application in existing system may not work efficiently in case of network failure which may be difficult for the users in isolated non-network area. The proposed system enhances the application by using gyroscope. The system comprises of models and components which is basically done by mobile application development using IOT. A gyroscope is a wheel mounted in two or three gimbals, which are pivoted supports that allow the rotation of the wheel about a single axis. The proposed system embeds the gyroscope in mobile phones. The proposed system does not require any use of mobile data or network tower, so the application will efficiently without any failures. Usually accelerometer measures the linear acceleration of the mobile phone, whereas the gyroscope measures the orientation of mobile phone and adds the values supplied by the accelerometer by tracking rotation or a twist. The 360 degree photos or videos are watched using his sensor. As the phone is moved, the video or the photo portion also changes accordingly because of gyroscope. A gyroscope is a wheel mounted in two or three gimbals, which are pivoted supports that allow the rotation of the wheel about a single axis. A set of three gimbals, one mounted on the other with orthogonal pivot axes, may be used to allow a wheel mounted on the innermost gimbal to have an orientation remaining independent of the orientation, in space, of its support. In the case of a gyroscope with two gimbals, the outer gimbal, which is the gyroscope frame, is mounted so as to pivot about an axis in its own plane determined by the support. This outer gimbal possesses one degree of rotational freedom and its axis possesses none. The inner gimbal is mounted in the gyroscope frame (outer gimbal) so as to pivot about an axis in its own plane that is always perpendicular to the pivotal axis of the gyroscope frame (outer gimbal). This inner gimbal has two degrees of rotational freedom.

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CONCLUSION

Orientation sensors are ineffective in determining orientations due to the magnetic and accelerative interferences resulting from general use. By integrating the angular velocity output of the Nexus S gyroscope, we were able to predict angular orientations to within 6% for test rotations, as well as detecting turns while the phone's orientation was constantly changing. When the user was walking, taking turns, and travelling up. By knowing the orientation of the phone at any time, it is possible to perform standard rotational mathematics to rotate measured vectors to a desired reference frame.

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MULTI SECURE: INTEGRATION OF BIG DATA AND CLOUD FOR EFFECTIVE MULTI SECURE DATA UTILITY WITH ACCESS VERIFICATION USING ABE

A PROJECT REPORT

Submitted by

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SHEIK ABDULLAH.M (311816104032)

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of

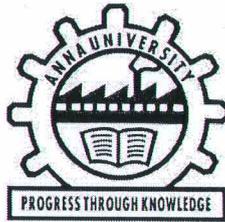**BACHELOR OF ENGINEERING**

in

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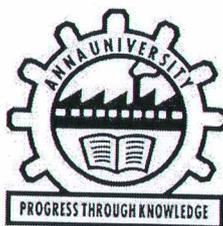
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Certified that this project **"MULTI SECURE: INTEGRATION OF BIG DATA AND CLOUD FOR EFFECTIVE MULTI SECURE DATA UTILITY WITH ACCESS VERIFICATION USING ABE"** is the bonafide work of **MOHAMED HARAFATH.S (311816104014) & SHEIK ABDULLAH.M (311816104032)** who carried out the project work under my supervision.

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INTERNAL EXAMINER

EXTERNAL EXAMINER

ABSTRACT

In the **PROPOSED SYSTEM**, proposed proxy-based multi-cloud computing framework allows dynamic, on- the-fly collaborations and resource sharing among cloud- based services. Security issue is the major issue in the cloud. So data is principally categorized into 3 major parts, like High Security, Medium Security and low security.**MODIFICATION** of the project, is apart from proposed system, Data is secured by encryption and stored in cloud.As per proposed system,we implement High security with data encryption and the data is splitinto two parts and stored in two parts. In medium secured, data is encryption and data is stored in single cloud. In the normal security data is encrypted and stored.

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CONCLUSION

Thus the paper infers that user's information will be stored on cloud based on sensitivity of the data. Users were maintaining more number of data on cloud but security for that data is less. So we secure the data on three differentlevel.

AUTOMATED OBJECT PATH TRACKING USING VECTOR MAPPING AND RGB ANALYSIS METHOD

A PROJECT REPORT

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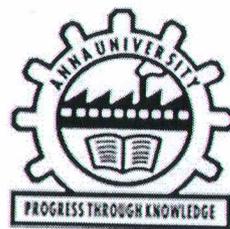
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BONAFIDE CERTIFICATE

Certified that this project report **"AUTOMATED OBJECT PATH TRACKING USING VECTOR MAPPING AND RGB ANALYSIS METHOD"** is the bonafide work of **B. Mohamed Sarvath Khan (311816104016) and S.J. Shakeel (311816104031) and S. ShaileshSivam (311816104030)** who carried out their project work under my supervision.

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Project Viva-Voce held on 22. 09. 2020

INTERNAL EXAMINER

EXTERNAL EXAMINER

ABSTRACT

Anomalous events detection in real-world video scenes is a challenging problem due to the complexity of **"Anomaly"** as well as the cluttered backgrounds, objects and motions in the scenes.

Most existing methods use hand-crafted features in local spatial regions to identify anomalies, the proposed system uses RGB Variation algorithm, which utilizes to learn video representation automatically and understand the anomalies like accidents, fires, robbery, etc.

The proposed system detects those anomalies in real world scenarios like live security surveillance and if an anomaly like theft happens the proposed system will alert the respective authority of the incident.

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CONCLUSION

In this paper, the machine learning paradigm is being collaborated with video surveillance system and image processing to make a module that has both speed and good performance. The proposed system can be a game changer in the field of video monitoring and surveillance systems. Overall from the work presented it is shown that proper combination of low-level features that have low computational complexity are sufficient for vehicle tracking compared to complex feature tracking methods. To improve the performance of the collision detection algorithm, it is planned to collect more crash cases from real-Manual situations by installing a camera at busy intersection and to analyze the performance of the algorithm on real-Manual situations. This can be furthermore be improved by using higher level algorithms and better classification to improve efficiency and accuracy.

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CLASSIFICATION OF SKIN DISEASE USING CONVOLUTIONAL NEURAL NETWORKS

A PROJECT REPORT

Submitted by

RAM KUMAR S	**(311816104024)**
ASIISHA BEE H	**(311816104007)**

in partial fulfillment for the award of the degree

of

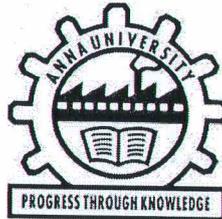## BACHELOR OF ENGINEERING

in

COMPUTER SCIENCE AND ENGINEERING

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INTERNAL EXAMINER

EXTERNAL EXAMINER

ii

Abstract

Skin diseases have a serious impact on people's life and health. It is necessary to develop automatic methods in order to increase the accuracy of diagnosis for multi type skin diseases. The aim of this system is to increase better diagnosis and treatment results by computer assisted disease classification (Psoriasis, Ringworm) using medical image processing and machine learning techniques. Preprocessing step removes the flash light reflection from the RGB disease images. Using active contour segmentation wounded areas are segmented from the skin. The segmented and their corresponding ground truth images are given as input to the convolutional neural network. After CNN training, a fully connected layer gives the output as segmented images which include different types of disease which is to be predicted.

CONCLUSION

The proposed system is based on the automatic disease classification of disease like psoriasis and ringworms using Convolutional Neural Network. In this CNN classified images with complicated structures were able to be recognized. Using CNN the method has a great advantage of minimum pre-processing and post processing of images. The results obtained in our system will help the clinicians to assess the healing status and treatment for disease based on the accurate tissue classification which is the important step in diagnosis of skin disease patients. The future work deals with making the dataset to be larger and adding more disease classes. It will increase the efficient classification and it is able to process the complicated textures. The proposed method is used for assessing the skin health conditions of the patients remotely without having a doctor nearby.

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PEOPLE IDENTIFICATION AND COUNTING WITH CONVOLUTIONAL NEURAL NETWORK USING OPENCV

A PROJECT REPORT

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N.Naveen Kumar (311816104021)
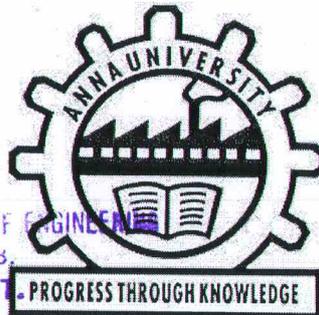
In partialfulfillment of the award of the degree

of

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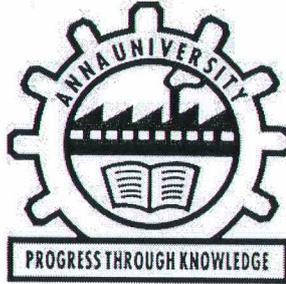### IN

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Project viva-voce held on   22.09.2020.

INTERNAL EXAMINAR   **EXTERNAL EXAMINAR**

ABSTRACT

This paper describes a People Counting System Is based on Image processing techniques to count human traffic at various places like retail shops, malls, ATMs etc. The module was made using an WiFistream from an overhead IP (Internet Protocol) CCTV camera and processed through OpenCV library in Python. The live video feed is taken frame by frame to process and morphological operations were applied to each frame to get rid of noises and get proper blobs. Next, using contours method we extract the co-ordinates of each blob and track them so that the blob can be counted in a region of frame. The accuracy of the counting depends on a number of factor such as height of camera ,field of vision, camera angle, lighting etc.

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CONCLUSION

In this paper, we have proposed a method which estimates "how many pedestrians are and where they are in video sequences" in real-time. We have shown that the proposed method is executed faster than 10fps and its accuracy is higher than 90%.

There are remaining works as follows:

Improvement of background subtraction: In the proposed method, background subtraction is used for segmentation. For background subtraction, we have used the background model using contour blob estimation. Because this model is based on pixel values observed in a sequence of the latest N frames, pedestrians staying at the same place are incorporated into the background model and they cannot be correctly extracted. Therefore, in those cases, a neural network tends to output incorrect estimation, such as the wrong number of pedestrians and incorrect

labeling as non-pedestrian regions. This problem will be solved by adaptive modeling of detected blobs, where the background model around stationary blobs is not updated. Research of better features: There might be better features than those used in the proposed method. Hence, we have to try variouscombination of features to get better performance.

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FACE RECOGNITION SYSTEM USING OPENCV
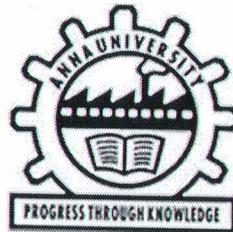
A PROJECT REPORT

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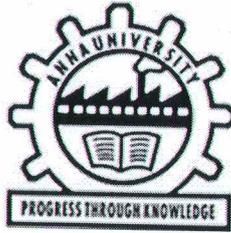
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ABSTRACT

The face is one of the easiest ways to distinguish the individual identity of each other. Face recognition is a personal identification system that uses personal characteristics of a person to identify the person's identity. Human face recognition procedure basically consists of two phases, namely face detection, where this process takes place very rapidly in humans, except under conditions where the object is located at a short distance away, the next is the introduction, which recognize a face as individuals. Stage is then replicated and developed as a model for facial image recognition (face recognition) is one of the much-studied biometrics technology and developed by experts. There are two kinds of methods that are currently popular in developed face recognition pattern namely, Eigen face method and Fisher face method. Facial image recognition Eigen face method is based on the reduction of face-dimensional space using Principal Component Analysis (PCA) for facial features. The main purpose of the use of PCA on face recognition using Eigen faces was formed (face space) by finding the eigenvector corresponding to the largest eigenvalue of the face image. The area of this project face detection system with face recognition is Image processing. The software requirements for this project are matlab software.

Keywords: face detection, Eigen face, PCA, matlab

Extension: There are vast number of applications from this face detection project, this project can be extended that the various parts in the face can be detect which are in various directions and shapes.

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CONCLUSION

The computational models, which were implemented in this project, were chosen after extensive research, and the successful testing results confirm that the choices made by the researcher were reliable. The system with manual face detection and automatic face recognition did not have recognition accuracy over 90%, due to the limited number of Eigen faces that were used for the PCA transform. This system was tested under very robust conditions in this experimental study and it is envisaged that real-world performance will be far more accurate. The fully automated frontal view face detection system displayed virtually perfect accuracy and in the researcher's opinion further work need not be conducted in this area.

The fully automated face detection and recognition system was not robust enough to achieve a high recognition accuracy. The only reason for this was the face recognition subsystem did not display even a slight degree of invariance to scale rotation or shift errors of the segmented face image. This was one of the system requirements identified in section 2.3. However, if some sort of further processing, such as an eye detection technique, was implemented to further normalise the segmented face image, performance will increase to levels comparable to the manual face detection and recognition system. Implementing an eye detection technique would be a minor extension to the implemented system and would not require a great deal of additional research.All other implemented systems displayed commendable results and reflect well on the deformable template and Principal Component Analysis strategies. The most suitable real-world applications for face detection and recognition systems are for mugshot matching and surveillance. There are better techniques such as iris or retina recognition and face recognition using the thermal spectrum for user access and user verification applications since this need a very high degree of accuracy.The real-time automated pose invariant face detection and recognition system proposed in chapter seven would be ideal for crowd surveillance applications. If such a system were widely implemented its potential for locating and tracking suspects for law enforcement agencies is immense.

The implemented fully automated face detection and recognition system (with an eye detection system) could be used for simple surveillance applications such as ATM user security, while the implemented manual face detection and automated recognition system is ideal of mugshot matching. Since controlled conditions are present when mugshots are gathered, the frontal view face recognition scheme should display a recognition accuracy far better than the results, which were obtained in this study, which was conducted under adverse conditions.
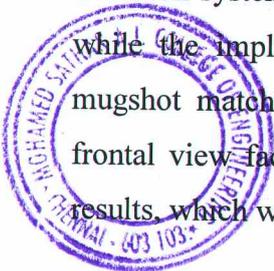
BIKE RIDERS MONITORING SYSTEM

A PROJECT REPORT

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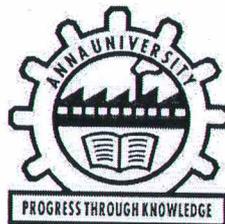O.A.C

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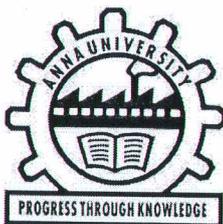*in*

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INTERNAL EXAMINER

EXTERNAL EXAMINER

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ii

ABSTRACT

The use of motorcycle accidents has rapidly increased. Although the helmet is the main safety equipment of motorcyclists, many drivers do not use it. This paper proposed a method for motorcycle detection and classification and a system for the detection of motorcyclists without helmets. For vehicle classification, we have employed the wavelet transform (WT) as the descriptor and the random forest as the classifier. For helmet detection, the circular Hough transform (CHT) and the histogram of oriented gradients (HOG) descriptor were applied to extract the image attributes, and the multilayer perceptron (MLP) classifier was used to classify the objects.

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CONCLUSION

The condition selected for classifying the captured frames is a person with more the two while driving a two-wheeler. Firstly, we classify images that contain a person travelling in more than two not. Then, we analyze the classified images to obtain the dataset based on the condition. The captured frames that contain images other than the abovementioned condition will be discarded or not considered. In future we add the license plate recognition module so it gives the complete details of the bike owner. This can be helpful in future to minimize the law violation and life loss.

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