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

CS6202 **PROGRAMMING AND DATA STRUCTURES I** **L T P C**
3 0 0 3

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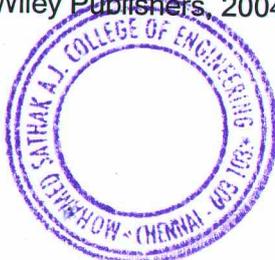
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CS6001   C# AND .NET PROGRAMMING   L T P C
                                                                  3 0 0 3

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, Versioning, 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.

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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.

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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.

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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.

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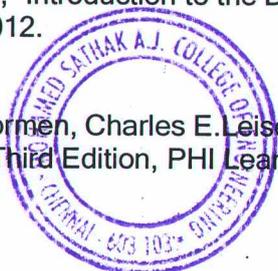
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CS6501   **INTERNET PROGRAMMING**   **L T P C**
                                                                           3 1 0 4

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.

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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.
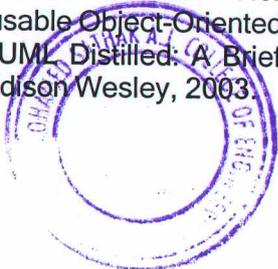
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CS6504 COMPUTER GRAPHICS L T P C
3 0 0 3

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.

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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.

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
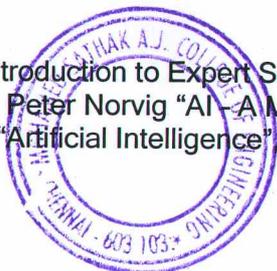
OBJECTIVES:
The student should be made to:
- Understand OSI security architecture and classical encryption techniques.
- Acquire fundamental knowledge on the concepts of finite fields and number theory.
- Understand various block cipher and stream cipher models.
- Describe the principles of public key 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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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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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", 3rd Edition, Pearson Education, 2004 (UNIT I , II & III).
2. Brian Fling, "Mobile Design and Development", First Edition , O"Reilly Media Inc., 2009 (UNIT -IV).
3. Bill Scott and Theresa Neil, "Designing Web Interfaces", First Edition, O"Reilly, 2009.(UNIT-V).

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.

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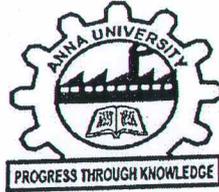
METAL AS A SERVICE USING LINUX CONTAINERS

A PROJECT REPORT

Submitted by

MOHANARANGAN M - 311813104017

in partial fulfillment for the award of the degree

of

BACHELOR OF ENGINEERING

in

COMPUTER SCIENCE AND ENGINEERING

MOHAMED SATHAK A J COLLEGE OF ENGINEERING

ANNA UNIVERSITY::CHENNAI 603 103

APRIL 2017

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BONAFIDE CERTIFICATE

Certified that this project report **"METAL AS A SERVICE USING LINUX CONTAINERS"** is the Bonafide work of **"MOHANARANGAN M (311813104017)"** who carried out the project work under my supervision.

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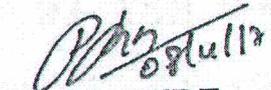
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SUPERVISOR

Computer Science and Engineering

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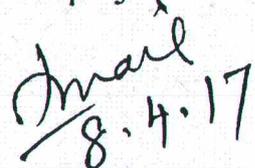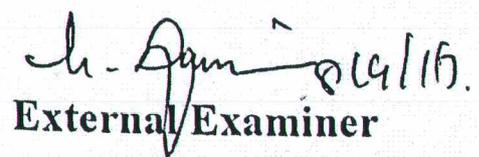
Internal Examiner

External Examiner

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ABSTRACT

Since virtualization was developed and cloud computing became mainstream, distributed applications run on virtual machines for hardware resource utilization to facilitate operations. However, this comes at a significant cost because of the inefficiencies in the way Virtual machines are deployed on a machine. This cost is magnified several thousand folds when it comes to public cloud services. Using operating system level virtualization techniques like containerization, the costs can be brought down by a factor of 60 percent and performance can be increased by the same magnitude. However, the cloud providers still rely on virtual machines to provide them with the required level of isolation between different customers. It is possible to provide a way for cloud providers to run their customer's containers on bare-metal hardware without ever using a virtual machine.

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CHAPTER 8
CONCLUSION

Thus, it has been shown that process isolation and multi-tenancy can be achieved without ever using a virtual machine. Since containers provide the density and performance that hasn't ever been possible with virtual machines, it is only natural that the world of cloud computing adopts containers and operating system level virtualization as the standard. This project has demonstrated the fact that it is possible to build sophisticated systems that provide multi-tenant access to a cluster. In the future, more feature-rich systems will be built to facilitate the same workflow.

DEDUPLICATION ON ENCRYPTED DATA IN CLOUD STORAGE USING DATA MINING

A PROJECT REPORT

Submitted by

RIYAZ FARIS AHAMED - 311813104028

SAIF AHMED KHAN - 311813104030

in partial fulfillment for the award of the degree

of

BACHELOR OF ENGINEERING

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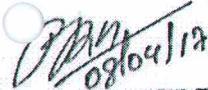
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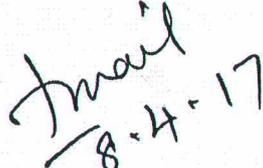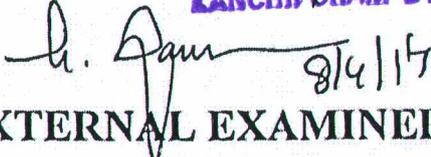
INTERNAL EXAMINER

EXTERNAL EXAMINER

ABSTRACT

In cloud storage data mining brings a lot of information extraction security and privacy concerns arise as users' sensitive data are susceptible to both inside and outside attacks. Data Deduplication is one of important data mining techniques for eliminating duplicate copies of repeating data by it compares the data in cloud storage to reduce the amount of storage space and save bandwidth. The existing system consists of a convergent encryption technique that has been proposed to encrypt the data before outsourcing. To better protect data security, the proposed system makes the first attempt is to formally address the problem of authorized data Deduplication. The proposed system consists of another advanced duplication system supporting authorized duplicate check and compares the storage system with file content. The main idea of the proposed technique is that the novel encryption key generation algorithm. For simplicity, it uses the hash functions to define the tag generation functions and convergent keys . The authorized duplicate check for this file content can be performed by the Naive Bayes classifier in the server storage before uploading this file. Based on the results of duplicate check, the user either Data uploads this file

KEYWORD:- Data Mining, Hash Function, Outsourcing, Convergent Keys, Naive Bayes.

CONCLUSION AND FUTURE ENHANCEMENT

Managing encrypted data with deduplication is important and significant in practice for achieving a successful cloud storage service, especailly for big data storage. In this paper, we proposed a practical scheme to manage the encrypted big data in cloud with deduplication based on ownership challenge and PRE. Our scheme can flexibly support data update and sharing with deduplication even when data holders are offline. Encrypted data can be securely accessed because only authorized data holders can obtain the symmetric keys used for data decryption. Extensive performance analysis and test showed that our scheme is secure and efficient under the described security model and very suitable for big data deduplication. The results of our computer simulations further showed the practicability of our scheme.

Futurework includes optimizing our design and implementation for practical deployment and studying verifiable computation to ensure that behaves as expected in deduplication management.
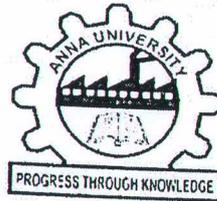
LEVERAGING IPFS FOR PERMANENT CLOUD STORAGE

A PROJECT REPORT

Submitted by

S RESHMA RAHILA   -   311813104027

*In partial fulfillment for the award of the degree*

of

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in

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APRIL 2017

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Assistant professor

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INTERNAL EXAMINER

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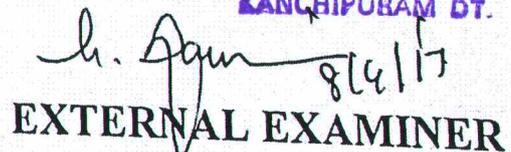
EXTERNAL EXAMINER

ABSTRACT

The existing cloud storage solutions store the file in a single location that is prone to various problems like lack of end point, government blocking and data hijack. The Inter Planetary File System (IPFS) is a peer-to-peer distributed file system that seeks to connect all computing devices with the same system of files. IPFS has no single point of failure, and nodes do not need to trust each other. The IPFS can be used in place of a normal file system for cloud storage so as to provide permanent and reliable storage. This also prevents vendor lock-in and potentially revolutionizes the way cloud storage works. Cloud providers therefore encrypt the files using the user's public key which only he can decrypt. They also have sophisticated access control mechanisms to prevent unauthorized access.

KEY TERMS – IPFS, PERMANENT STORAGE.

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CONCLUSION AND FUTURE ENHANCEMENT

Further considerations of access control can also addressed to encrypt and restrict content based privacy and security mechanisms. Another model of IPFS based archiving system can be built using IPFS and IPNS technologies without the need of external indexes.In this work we developed a prototype to partition disseminate and replay WARC file records in the interplanetary file system .

With IPFS as a major player, things would definitely change. Although IPNS nodes can be mapped to HTTP addresses currently, they would not necessarily need to be forever.

Web browsers might change, or be removed entirely. More likely, given the transition, you'd simply begin using multiple protocols to access content (instead of typing http:// you might end up with several other protocols available in major browsers).

These browsers would also need to be equipped with an automatic way to replace any locally cached content, if the node the browser attempts to contact has content that has been altered and is presenting a new hash

Browsers, or other clients, might be the only necessary software. Remember that IPFS is peer to peer, so your IPFS installation is simply reaching out to locate others.

You also may wonder what happens with websites serving dynamic content. The answer here is far less clear. While updating static content and republishing to

59

IPFS might not be such a challenge, dynamic, database-driven websites will be significantly more complicated.

The challenge ahead will be for developers and proponents of the system to create not only but also practical alternatives to cover these use cases, as a huge portion of the Web today is driven by dynamic database content. IPNS provides some potential solutions here, as do other services that are being developed, but a production-ready solution is yet to come.

It's more of a fascinating prototype of what the Web could look like in coming years. The more people who test, contribute, and work to improve it, the greater chance it will have to change the way we serve content on the Internet as a whole. So get involved

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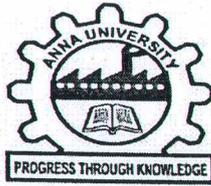
DATABASE OPTIMIZATION AND SHARDING SYSTEM

A PROJECT REPORT

Submitted by

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In partial fulfillment for the award of the degree

of

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in

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BONAFIDE CERTIFICATE

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Submitted for the project viva voce held on ___8.4.17___

INTERNAL EXAMINER

EXTERNAL EXAMINER

ABSTRACT

Database Optimization and Sharding System (DOSS) have served the data from Single Server to Many Databases for high throughput and low latency. They are easily understood and applied, but it traditional exist some congenital shortcomings, such as expanding difficult. With the accelerating process of Server, the last few years have seen an explosive increase in the volume of data from many users and they are likely to be stored in different Servers. We have to face the uncomfortable fact that DOSS architectures have reached their limits. In this paper, we introduce an innovative distributed database solution based on MySQL to meet the needs of horizontal scalability without affecting the specific implementation of application, which lets users think that it's a single MySQL database logically, actually being a distributed database system physically.

Keywords: Sharding, Scalability, Distributed Database.

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CHAPTER 8

CONCLUSION

Now, enterprises or organizations have to spend more energy to deal with this challenge that the relational data to be stored has beyond storage limit of a single database server. Even worse is that traditional relational databases are almost difficult to extend. It is generally accepted that the ideal solution is to distribute data to multiple servers. According to this idea, we design the system as database middleware to achieve data partition. The programmer just need to focus on the business logic without understanding the underlying data distribution and structure by using this system and the extra work is merely to configure several fields. After the system test, it's not hard to find that the system could basically meet the needs of practical application on the functionality and performance. It is an undeniable fact that the system still has a few problems which will be solved in the future, but the system still has great practical value.
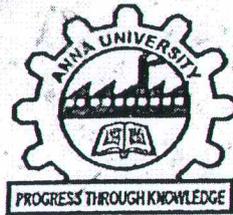
DEMOCRATIC DIFFUSION RE-RANKING FOR

IMAGE RETRIEVAL

A PROJECT REPORT

Submitted by

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in partial fulfillment for the award of the degree

of

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in

COMPUTER SCIENCE AND ENGINEERING

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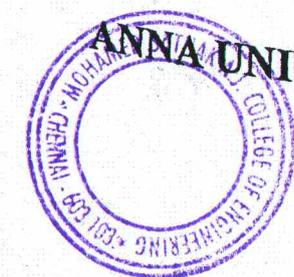
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BONAFIDE CERTIFICATE

Certified that this project report **"DEMOCRATIC DIFFUSION RE-RANKING FOR IMAGE RETRIEVAL"** is the Bonafide work of **"E.SAVITHRI(311813104031)"** who carried out the project work under my supervision.
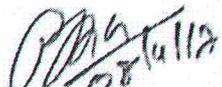
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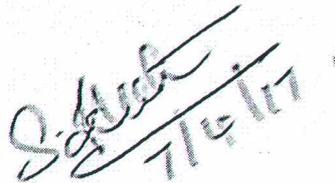
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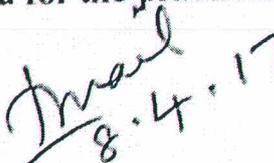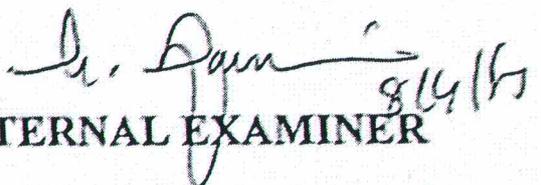
INTERNAL EXAMINER

EXTERNAL EXAMINER

ABSTRACT

Multimedia is a combination of different content forms such as text, audio, images, animations, video and interactive contents. Here users mostly search for images according to their requirements; those retrieved images could have quality issues. Due to this type of issues in image retrieval for users, they find it difficult. This is the major disadvantage for the image retrieval users. Mostly, users prefer for a good and high quality image relevant to what they search for. To overcome, this type of quality issue we go for image based ranking method by using democratic diffusion aggregation to obtain a better quality image for the users. By this ranking methodology for image retrieval give by the viewed users will rearrange the position of the images to easily get good quality image that the user search for.

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CHAPTER 9

CONCLUSION AND FUTURE ENHANCEMENT

9.1 CONCLUSION

In this work, first the user search the image by using a keyword, all related images are displayed after viewing those images user gives annotation about those viewed images. By using that annotation the images are re-ranked updated in the database from where these images are retrieved. The re-ranked images will be listed at the top of the webpage so that the user can easily get the preferred good and high quality image based on the keyword they searched. The time taken to retrieve the image is minimal and gives high quality image.

9.2 FUTURE ENHANCEMENT

In the future, we can reduce the time taken to retrieve the image and increase the efficiency of image retrieval. There is no need of low pixel images.

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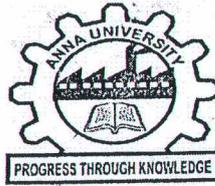
PREVENTION OF BOTNET BASED ON NETWORK ANOMALY DETECTION

Submitted by

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NAZEEF HUSSAIN A – 311813104021

in partial fulfillment for the award of the degree

of

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in

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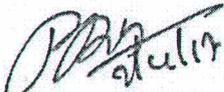
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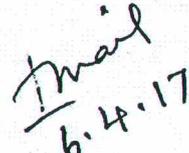
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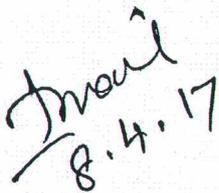
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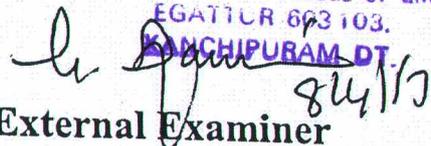
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ABSTRACT

Botnet is a collection of compromised computers often referred as "zombies" Infected with malware that allows an attacker to control them. Botnet owners or "herders" are able to control the machines in their botnet by means of a convert channel such as IRC, issuing commands to perform malicious activities such as DDoS attacks, the sending of spam mail, and information theft.

The existing system uses conventional methods. It uses flow clustering based analysis to detect the presence of botnets. However, these conventional methods are incapable of preventing emerging botnet attacks. Thus the proposed concept employs a novel approach of preventing the proliferation of malware in the network. It scans all incoming and outgoing traffic to inspect malware and secures the message from harmful content. The infected node is further quarantined to prevent further proliferation of malware in the network.

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Chapter 8

CONCLUSION

Thus, the proposed system is optimal in detecting bots and preventing the proliferation of malware in the network. Since a botnet duplicates itself and proliferates in a network, it detects the bot at an early level and quarantines the infected nodes to prevent further proliferation. The quarantined nodes cannot carry out further communications and are blocked until the infected node is protected from the threat. This can prevent the botnet attacks on a large scale.

FUTURE ENHANCEMENTS:

In future enhancements, the proposed idea can further be enhanced by enabling detection of bots based on behaviour analyses. This is not similar to the previous method of signature based clustering, as it is capable of detecting only known bot signatures. The future enhancement would be capable of matching the behavioural/communication pattern of every node and would group similar behaving nodes as suspected nodes and quarantine them until a patch for the threat is created.
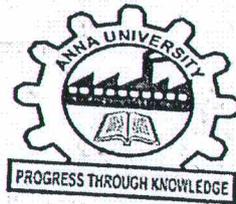
Incremental MapReduce Mining Evolving Big Data using Naive Bayes Classification.

A PROJECT REPORT

Submitted by

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THANVEER AHMED R –   *311813104033*

in partial fulfillment for the award of the degree

of

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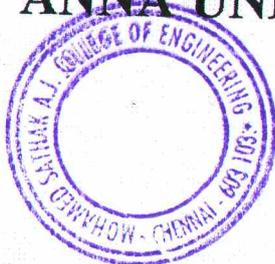
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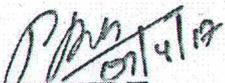
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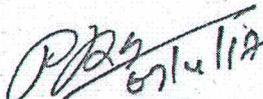
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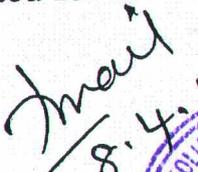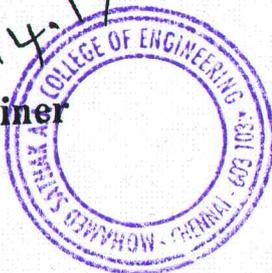
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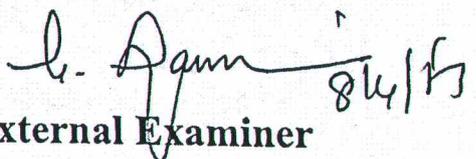
ABSTRACT

A data center is a facility used to house computer systems and associated components, such as telecommunications and storage systems. Large datacenters are industrial scale operations using as much electricity as a small town. Data mining is the practice of examining large pre-existing databases in order to generate new information. The datacenter which use **Support Vector Machine (SVM)** are supervised learning models with associated learning algorithms that analyze **data** used for classification and regression analysis which have unstructured datasets. In the proposed model, **Naive Bayesian Algorithm (NBA)** is used for more efficient **Quality of service** and requires much lesser training time than the existing model.

KEYWORD: Extraction, Comparison, Binning, Collinearity, Clustering.
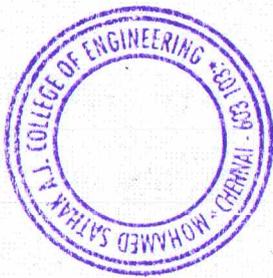
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CHAPTER 8
CONCULSION AND FUTURE ENHANCEMENT

8.1 CONCLUSION

Data analytics is becoming one of the most rapidly advancing techniques in the field of Big Data especially with increase in technology advancements in Internet, Data Analytics and Data mining. With the technology advancing on one side, so is the size of Data and the need of data analysis. This has necessitated an ever growing and systematic approach to ensure the efficiency and QoS is enhanced in the Data analysis. In thesis the efficiency and QoS is enhanced by using the Naïve Bayes Classifier.

8.2 FUTURE ENHANCEMENT

Data analytics can be improvised by analyzing it with combination of algorithms. Each algorithms have their own and unique pros and cons. Depending on the analysis the pros of some algorithms can be used in the analysis. For instance, SVM is good with smaller set of data and it analyses datasets sequentially, whereas NBA analyses datasets in parallel. Combining these algorithms together can increase the efficiency further more.
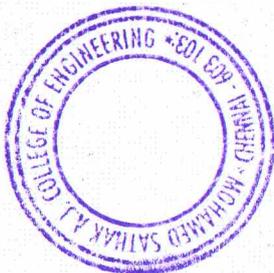
AN ARTIFICIAL INTELLIGENCE USER VOICE INTERFACE SYSTEM

A PROJECT REPORT

Submitted by

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in partial fulfillment for the award of the degree

of

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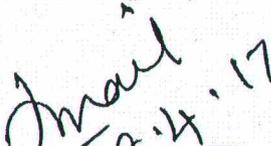
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Submitted for the project viva voce held on 08.04.17

Internal Examiner

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ABSTRACT

The interaction between humans and computers relies on small buttons for user input. These are either built into the device or are part of a touch-screen interface. Extensive button-pressing on devices with such small buttons can be tedious and inaccurate, so an easy-to-use, accurate, and reliable voice user interface will potentially be a major breakthrough in the ease of their use. This poject proposes such a voice user interface. Speech interface would benefit users of laptop and desktop-sized computers, as well, as it would solve numerous problems currently associated with keyboard and mouse use, including repetitive-strain injuries such as carpal tunnel syndrome and slow typing speed on the part of inexperienced keyboard users. Moreover, keyboard use typically entails either sitting or standing stationary in front of the connected display; by contrast, a voice user interface would free the user to be far more mobile, as speech input eliminates the need to look at a keyboard.

KEY TERMS – SAPI, Speech Recognition, Speech Synthesizer, Default Commands, Grammar.

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CHAPTER 8

CONCLUSION AND FUTURE ENHANCEMENT

Hence, as an intelliegent personal digital assistant, anytime, anywhere, Jarvis will work under command. Jarvis is entirely intended for both business and common use, offering full keyboards and scroll wheels to facilitate data entry and navigation. Whether it is to type a document or check out your social networking sites, you tell him, he does it.

For the record, the tasks that Jarvis can do include opening any website/program (customizable) and retrieving emails. Furthermore, he can type anything that you say, close any or all programs, switch windows to other programs, play/pause/volume controls on music/videos and full volume control of the system. Jarvis can set reminders, set or clear alarms, answer questions like weather conditions/forecast, date/year and facilitate Google search. He can do a lot more.

Jarvis also includes a music recognition service, which means users can ask Jarvis "what song is playing" or the details of the song (like artist name and year). It also includes a built-in media player and features text-to-speech mode.

Practically, for any control that you've been using keyboard, you can now control through voice commands from any distance across the room. Tell Jarvis, he'll do whatever you wish to do. The program is customizable. Users can add their own shell, web and social commands. No keyboards. All you need is a microphone!

As further improvements towards the project, Jarvis can be made more smarter and secure by adding a real time biometric system to authorize unlisted users to access certain parts of Jarvis. Jarvis can be made to accurately understand user context based on the situation and do live operations.
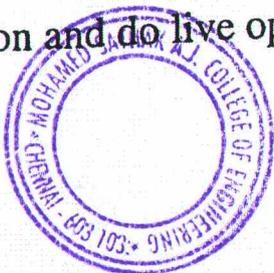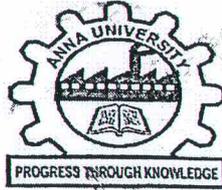
GEOGRAPHIC BASED DETECTION AND PREVENTION OF SPOOFING ATTACK

A PROJECT REPORT

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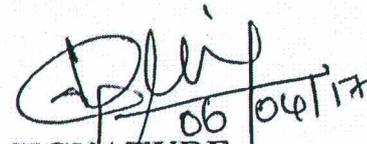
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Mohamed Sathak A.J College of Engineering,
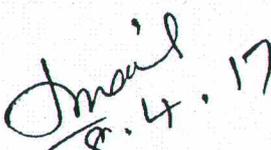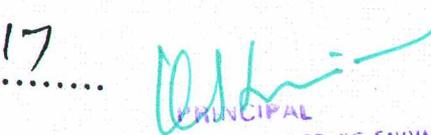
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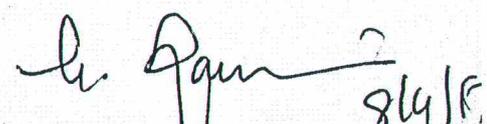
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ABSTRACT

Spoofing attacks remains one of the most damaging attacks in which an attacker can replace the original source address in the header with a new one to conceal their identity and location. Major spoofing attacks now a day's users face is the email spoofing attack in which the spoofer gets details from the email user they target and attack through the fake email sender with fake messages and viruses to attack the users system, mail list, etc. which causes a greater damage to the email user who have opened and responded to that mail. To overcome these types of attacks in this project we are analyzing the email with spammed contents to check whether it is from the right person or not and the location from where the mail has been sent by doing this we can secure the E-mail communication as maximum as possible.

KEY TERMS – Email Spoofing, Header Analyzer, whois, Geolocation.

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CHAPTER 7
CONCLUSION

Hence, we try to dissipate the mist on the location of spoofers. In this proposed system to track spoofer's location with publicly available information. and to make the email users aware of email spoofing attack by having this software for analyzing the mail header of the fake mail received in the mailing list and report it to spam or the user can themselves find from which location the spammed mail is sent.

FUTURE ENHANCEMENT

As further improvements towards the project, we can provide authentication in the mail server itself. The mail server can filter the spammed mails based on message ID only so we can analyze that the mail is from the registered mail service provider.

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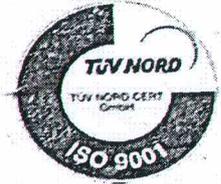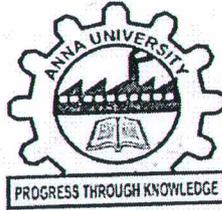
CRUCIAL EVENT MONITORING USING LAYERS OF CLUSTER ALGORITHM AND CLONE NODE DETECTION IN WSN

A PROJECT REPORT

Submitted by

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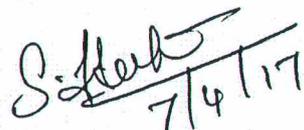
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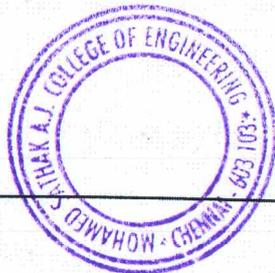
Submitted for the Project viva voce held on ....8·4·17.........

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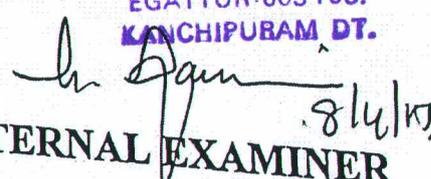
EXTERNAL EXAMINER

ABSTRACT

In mission-critical applications such as battlefield investigation etc, wireless sensors are deployed in wide range of areas, with a large number of sensor nodes detecting and reporting some information urgencies to the end-users. When a decisive event occurs in the monitoring area and it is detected by the sensor node it passes the information to the base station to take some response to the event. The main difficulty in this process is sensor node energy is very less and it is important to balance the given information (load) within the energy available in the node. Without any loss of data the node must transfer the data to the base station without any delay to avoid big catastrophe in the monitoring area. Another concern in WSN is its security, hackers of WSN is using clone node to get the control of the entire network. Considering these three attributes importance in crucial event monitoring algorithm is proposed to improve the energy efficiency, load balancing capability and to detect the clone nodes present in the network to ensure its security.
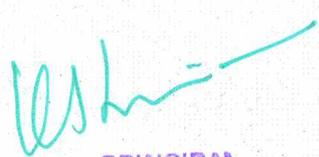
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CHAPTER 9

CONCLUSION AND FUTURE WORK

9.1. CONCLUSION:

Layers of cluster algorithm was introduced along with energy harvest and clone node detection in Wireless Sensor Network that satisfies the three major concerns of crucial event monitoring "Energy, Load and Security". Energy and Load balancing is done in this algorithm as it has Leader node to collect data from the cluster members and Cluster head to communicate to the BS. Energy Harvesting is done as ordinary sensor nodes saves energy in sleep mode to increase the lifetime of network when they become the Leader node or Cluster head based on the residual energy. In crucial event monitoring clone node detection plays a major security factor, in this algorithm Clone node is detected based on the location, id and time deployment of the node in the network. Hence, this algorithm improves the lifetime of network and satisfies three major factors of crucial event monitoring "Energy, Load and Security".

9.2. SCOPE OF FUTURE WORK:

Crucial Event Monitoring plays a vital role in Wireless Sensor Network, in this proposed system three major factors of crucial event monitoring "Energy, Load and Security" is achieved. Clone node detection enhances the security measure in this project. In future Clone node prevention can be done in crucial event monitoring system to avoid intruder from entering into the network.
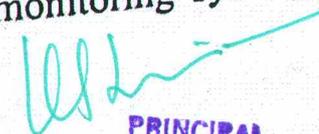
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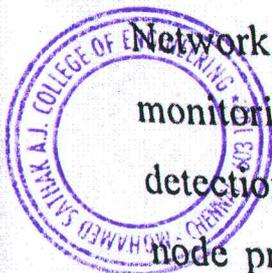
TWO-LEVEL AUTHENTICATION FOR MOBILE BILLING SYSTEM

A PROJECT REPORT

Submitted by

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In partial fulfillment for the award of the degree

of

BACHELOR OF ENGINEERING

in

COMPUTER SCIENCE AND ENGINEERING

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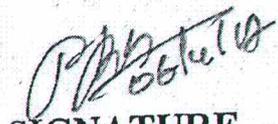
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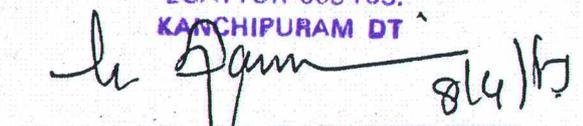
INTERNAL EXAMINER

EXTERNAL EXAMINER

ABSTRACT

Users could enjoy personalized services provided by various context-aware applications which collect users' contexts through sensor-equipped smart phones. Meanwhile, serious privacy concerns arise due to the lack of privacy preservation mechanisms. Currently, most mechanisms apply passive defence policies, in which the released contexts from a privacy preservation system are always real, leading to a great probability with which an adversary infers the hidden sensitive contexts about the users. Here we using two step of privacy to the application. One of the process is user has to give the correct normal password. The second one is image password, here user will select three images at the time of registration and at the login process they have to select the correct image for successful login. If the two steps are correct then only they can enter into the application otherwise it will show the error to the users. After they entered the billing section of the process. These billing section is simple to pay the bill amounts. These app is mainly used to uneducated people. This billing section steps are very simple pay the bill amount. After that the user can logout the application

KEY TERMS – Image password, billing section.

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CHAPTER 7

CONCLUSION

In this proposed system provides both feature of authentication and confidentiality by using the multilevel security for making payment by using these features it will lead to a higher level of security. In this system time consumption is reduced for making payment. This sort of payment method is used to make payment easier and efficient

FUTURE ENHANCEMENT

What will be interesting to see is where such multi factor authentication systems will be used in the future, such systems are still in their infancy and are being developed and worked upon with great interest keeping in mind the growing audience of both online monetary transactions and scanning capable smartphone users. In future enhancement using more level security system for this application and the transaction is more secure.
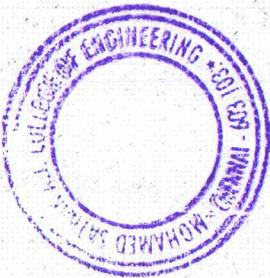
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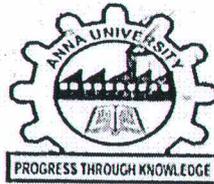
RATING OF PROS AND CONS BASED ON REVIEWS BY USING SENTIMENT ANALYSIS

A PROJECT REPORT

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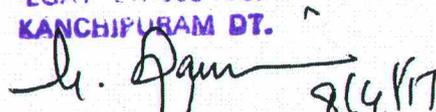
Internal Examiner

External Examiner

ABSTRACT

Several consumer reviews of products are now available on the Internet. Consumer reviews contain rich and valuable knowledge for both businesses and users. Before, There are two Existing methods are used in online. They are : Boolean weighting and term frequency (TF) weighting. Boolean weighting represents each review into a feature vector of Boolean values, each of which indicates the presence or absence of the corresponding feature in the review. Term frequency (TF) weighting weights the Boolean feature by the frequency of each feature on the corpus. In particular, given the consumer reviews of a product, this application first identify product aspects by a narrow dependency parser and determine consumer opinions on these aspects via a sentiment classifier. In this paper a product aspect ranking framework to automatically identify the important aspects of products from numerous consumer reviews. This paper demonstrate the potential of aspect ranking in real-world applications.In Existing system, they use bag of words to find whether the given review is positive or negative but they dint find the neutral review In Proposed system, Same bag of words is used, by using this bow they find the product aspects are identified which find all positive and negative and also neutral reviews which was given by the people. Significant performance improvements are obtain on the applications of document-level setiment and extractive review summarization by making use of aspect ranking. This paper give original ratings for online products based on consumer reviews
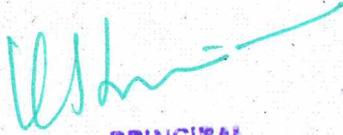
CONCLUSION AND FUTURE ENHANCEMENT

7.1 CONCLUSION

In this project mainly focused for business development for ac-curing the products enhanced for check growth level and assign the ratings to user involvement the product status will intimate to administrator. The rating value play a vital role to recommendation for business need and it get for ratings. The product aspects are finally ranked according to their importance scores. We have conducted extensive experiments to systematically evaluate the proposed framework. The experimental corpus contains 94,560 consumer reviews of 21 popular products in eight domains. This corpus is publicly available by request. Experimental results have demonstrated the effectiveness of the proposed approaches. Moreover, we applied product aspect ranking to facilitate two real world applications, i.e., document level sentiment classification and extractive review summarization. Significant performance improvements have been obtained with the help of product aspect ranking.

7.2 FUTURE ENCHANCEMENT:

In this project, Where buyers or users may rate for the products, using this ratings we are generating a bar graph for the products. It will help the sellers to grow their business and lead to user satisfaction. The Bar Graph will generate also analysis the individual project value assumption.
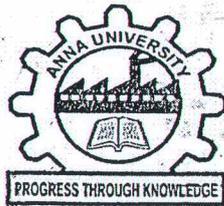
SECURED KEYWORD SEARCH RESULTS VERIFICATION IN CLOUD COMPUTING

A PROJECT REPORT

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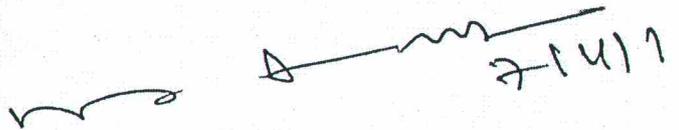
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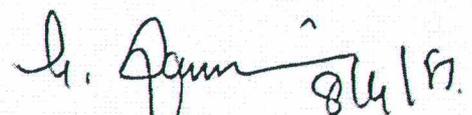
External Examiner

ABSTRACT

With the advent of cloud computing, more and more people tend to outsource their data to the cloud. As a fundamental data utilization, secure keyword search over encrypted cloud data has attracted the interest of many researchers recently. However, most of existing researches are based on an ideal assumption that the cloud server is "curious but honest", where the search results are not verified. In this paper, we consider a more challenging model, where the cloud server would probably behave dishonestly. Based on this model, we explore the problem of result verification for the secure ranked keyword search. Different from previous data verification schemes, we propose a novel deterrent-based scheme. With our carefully devised verification data, the cloud server cannot know which data owners, or how many data owners exchange anchor data which will be used for verifying the cloud server's misbehavior. With our systematically designed verification construction, the cloud server cannot know which data owners' data are embedded in the verification data buffer, or how many data owners' verification data are actually used for verification. All the cloud server knows is that, once he behaves dishonestly, he would be discovered with a high probability, and punished seriously once discovered. Furthermore, we propose to optimize the value of parameters used in the construction of the secret verification data buffer. Finally, with thorough analysis and extensive experiments, we confirm the efficiency and efficiency of our proposed schemes.

KEY TERMS – Cloud computing, dishonest cloud server, data verification.

CHAPTER 8

CONCLUSION AND FUTURE ENHANCEMENT

8.1 CONCLUSION

In this paper, the notion of authorized data deduplication was proposed to protect the data security by including differential privileges of users in the duplicate check. We also presented several new deduplication constructions supporting authorized duplicate check in hybrid cloud architecture, in which the duplicate-check tokens of files are generated by the private cloud server with private keys.

8.2 FUTURE ENHANCEMENT

Security analysis demonstrates that our schemes are secure in terms of insider and outsider attacks specified in the proposed security model. As a proof of concept, we implemented a prototype of our proposed authorized duplicate check scheme and conduct test bed experiments on our prototype. We showed that our authorized duplicate check scheme incurs minimal overhead compared to convergent encryption and network transfer.

REAL TIME EXAMPLE

Example: plaintext based keyword search

Cloud computing brings a lot of benefits, for privacy concerns, individuals and enterprise users are reluctant to outsource their sensitive data, including private photos, personal health records, and commercial confidential documents to the cloud. Because once sensitive data are outsourced to a remote cloud, the corresponding data owner directly loses control of these data.
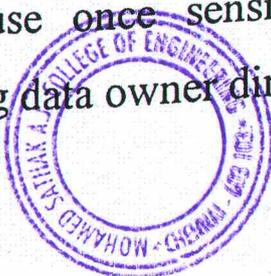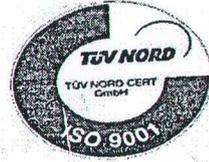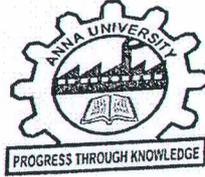
REMOTE VOTING USING AADHAAR
BIOMETRIC DATABASE

A PROJECT REPORT

Submitted by

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NAVEEN RAJ R - **311813104020**

in partial fulfillment for the award of the degree

of

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in

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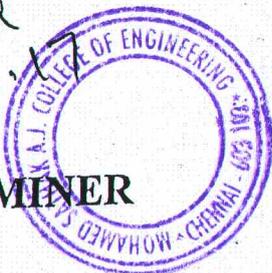Assistant professor

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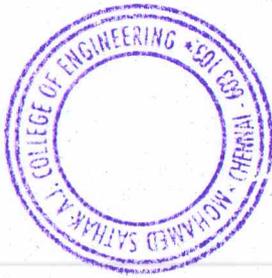MOHAMED SATHAK A.J. COLLEGE OF ENGINEERING
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INTERNAL EXAMINER

EXTERNAL EXAMINER

ABSTRACT

The conventional voting systems use postal voting or Absentee ballot. Nowadays the ballot papers are distributed to electors through post, which are returned by post. The conventional system faces issues such as postal voting frauds and complaints regarding irregular issue of ballots through post. Remote voting through smart phones overcomes these shortcomings using Aadhar biometric hash code matching to authenticate the user's identity. Through this approach postal voters will not miss their right to vote. These votes are stored in a secured server that cannot be tampered with.

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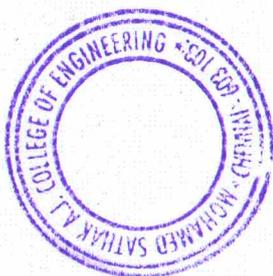
CHAPTER 7

CONCLUSION AND FUTURE ENHANCEMENT

7.1 CONCLUSION

In this project, we have to implement secured system for voting system. In this project we are using OTP, finger print authentication for security purpose and also implement the QR code system. It has several securities such us,

> Uniqueness - each user can cast their vote at only once

> Integrity - valid vote should not be modified or deleted

> Fairness - the election result should not be accessible before the official time ends

> Secrecy - No one should be able to find how voter cast their vote

> Cost-effectiveness - Election system should be efficient and affordable.

> Anonymity - No one can reveal about voter and his/her vote

7.2 FUTURE ENHANCEMENT

This application is only for postal voters. In future it will be implemented to support voting in general. People of India will not be forming a line. The Indian government can licensed this project to other countries. From this the government can earn more money. This will fast track the process of creating Digital India.

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