

# IOT Academy

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This is to certify that

**Dr. Vijayakumari K**

Assistant Professor

Trinity College for Women, Namakkal, India

has contributed a chapter in the book "**Modern Computer Science & Applications**"  
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Title

An IoT Knowledge for Research & Innovation Roadmap in the Field of Precision and Digital Agriculture



Mr. B. Sudagar  
Member

Mrs. Anisha  
Chief Editor

Director, T & D

## Chapter - 10

### An IoT Knowledge for Research & Innovation Roadmap in the Field of Precision and Digital Agriculture

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#### Abstract

Agriculture is a vital economic sector that contributes to a country's overall economic growth. According to the Food and Agriculture Society of the United Country, the global population is anticipated to grow up to 70% by 2050. Many recent technological breakthroughs in the sector of farming will aid in the expansion of agricultural activities. The industries of the internet of things (IoT) enable agriculturalists to look at these challenges. IoT Sensors are made to help farmers to decide crop harvests, soil humidity, rainfall, and livestock by IoT sensors. The agriculturalists can access this information by using smart mobiles. This chapter focuses on IoT-enabled smart farming, which allows farmers to examine operational data and make better decisions. The Internet of Things (IoT) deployment platform and communication technologies for smart farming, Precision Agriculture, and Digital Agriculture are discussed.

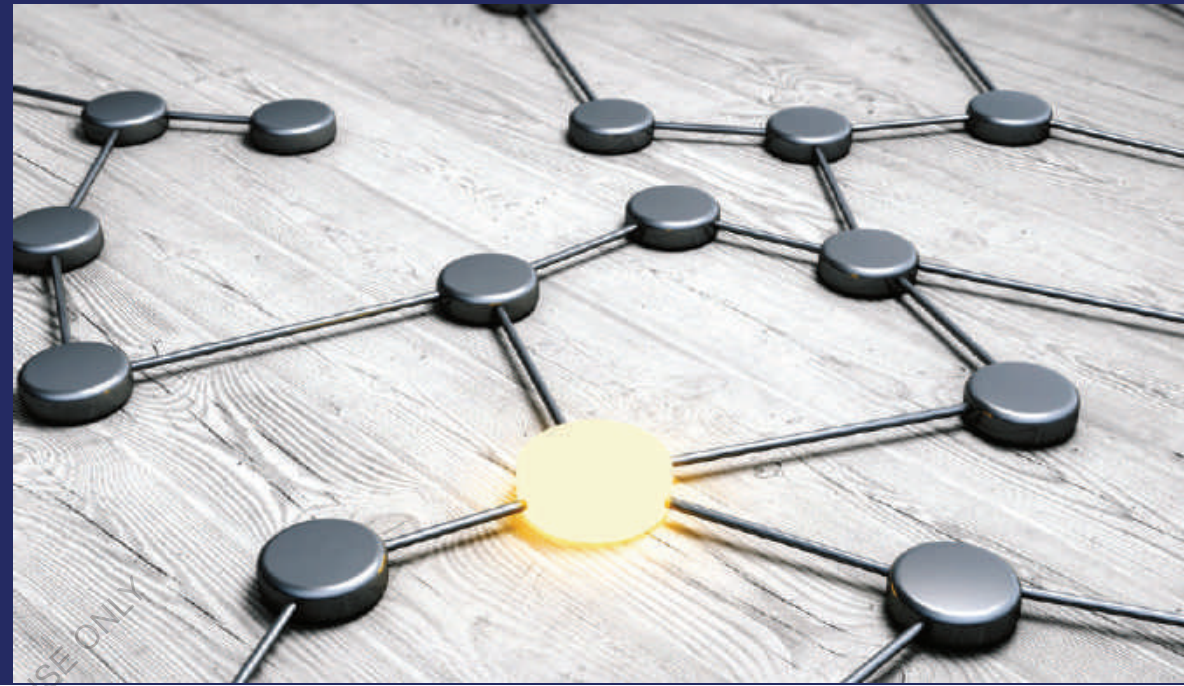
**Keywords:** IoT, Smart Farming, Digital Agriculture, Precision Agriculture, Sensors.

#### Introduction

IoT means the Internet of Things; it will connect the devices, machines, and tools to the internet with help of wireless technologies. As of now, over 9 billion things are connected to the internet, in the future; it will cross over 20 billion things. Also, we will say this as a M2M (Machine to Machine) connectivity, it extended to households, smart farming, smart city, and smart agriculture [1]. RFID, nanotechnology, sensors, and smart networks are examples of IoT enablers. According to Gartner Research, "The Internet of Things (IoT) is a network of physical items that contain embedded technology to communicate and perceive or interact with their internal states or the external environment."

IoT technology is a trending technology of today's world [2]. It brings a new revolution in each field of the common man's lifetime by building the whole thing smart and

Roads play a vital role to the people live in different places from day to day life, they travel to schools, to work, to shops, and to transport their goods. Even in this modern world, roads remain one of the mediums used most frequently for travel and transportation. The computation of the shortest path between different locations appears to be a key problem in the road networks. Even now, the problem still persists to find the shortest path on road networks. The wide range of applications was introduced to overcome the problem by developing various shortest path algorithms. The main aim of this thesis provides the optimal decision and transport advisory procedure to the passengers. In this research, to investigate Dijkstra algorithm and Floyd algorithm to establish the structure of transportation network and find the shortest path between two cities. It has formulated the optimal decision rules to analyze the time and distance parameters among two cities. It has used Dijkstra and Floyd algorithm in order to compare the performance and provide optimal solution to the passengers.



Dr. N. Elamathi  
R. Nithya

I am Dr. N. Elamathi working as an Assistant Professor in Department of Computer Science a Trinity College for Women, Namakkal, Tamil Nadu, India. I am guiding M.Phil and Ph.D. Scholars.

## An exploration of Dijkstra and Floyd algorithms in city traffic method



The cleanroom method of software development ensures the highest quality when developing software. This book outlines the time, purpose, use, and method for employing cleanroom software engineering for quality software. Cleanroom software is a theory-based, team-oriented process for developing very high-quality software under statistical quality control. Cleanroom combines formal methods of object-based box structure specification and design, function-theoretic correctness verification, and statistical usage testing for quality certification. The cleanroom reference model is expressed in terms of a set of 14 processes that comprise the practice of cleanroom software engineering. These processes form a comprehensive guide to cleanroom projects for software project management and performance, process assessment and improvement, and technology transfer and adoption. The subject of statistical testing and its relation to crypto analysis is also discussed. The test may be useful as a first step in determining whether or not a generator is suitable for a particular cryptographic application.



Usha Sundar



Mrs.S.Usharani Working as an Assistant Professor in the Department of Computer Science, Trinity College for Women(Arts and Science), Namakkal, Affiliated with Periyar University, Salem. Having 16+ years of Experience in Teaching . Published more than 10 papers in reputed journals. Having Excellent Knowledge in Data Mining and BigData.

## *Statistical Testing Trough Cleanroom Software Engineering*



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A cluster is the course of action of partition of a prearranged set of data into displace cluster. This is done in such a pattern that the same cluster is alike and data belong to different set is different. The main task of clustering are explorative data mining, and a common technique learning, pattern recognition image analysis, information retrieval, and Bioinformatics. Optimization is the process of finding the most cost effective or highest beneficial alternatives under the given constraints by maximizing desired factors and minimizing undesired ones.

The Bee Colony Optimization algorithm is a population based swarm intelligent family, it has to solved local optima problem and overwrite the demerit of Particle swarm optimization algorithms. BCO are inspired by the principles of natural biological behaviour and circulated communal behaviour of social colonies has shown superiority in production with complex optimization problems. In this thesis, Fuzzy Bee Colony Optimization (FBCO) was wished-for that algorithm furnished incredibly shining effect match up to with other active algorithms such as Fuzzy C-Means and Fuzzy Particle Swarm Optimization.



Vijayakumari Kaliannan

# Performance Analysis of Clustering Based on Fuzzy system



**Dr. K. Vijayakumari**, Working as an Assistant Professor in Department of Computer Science, Trinity College for Women (Arts and Science), Namakkal, Affiliated to Periyar University Salem. She has 2+Years of Experience in teaching. She has published more than 10 papers in reputed journals. she has a strong academic knowledge in Data Mining.



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Dr. P. Saranya has served as an Assistant Professor and Undergraduate Head of the Department of Mathematics at Trinity College for Women, Namakkal. She has completed her M.Sc., M.Phil., Ph.D., and PGDCA. She has more than five years of UG and PG teaching experience in arts and science colleges. She has published 10 research papers in several reputed journals at national and international levels. She has also presented different articles in seminars, conferences, etc. in more than 10 forums. She also participated in 2 short-term courses, 5 workshops, and 31 seminars, webinars, and conferences, etc. She also acted as a resource person in six seminars, webinars, and conferences. She also attended 12 faculty development programs and guided 13 PG projects and 2 UG projects. She is interested in intuitionistic topology, algebraic topology, fuzzy topology, and rough topology.

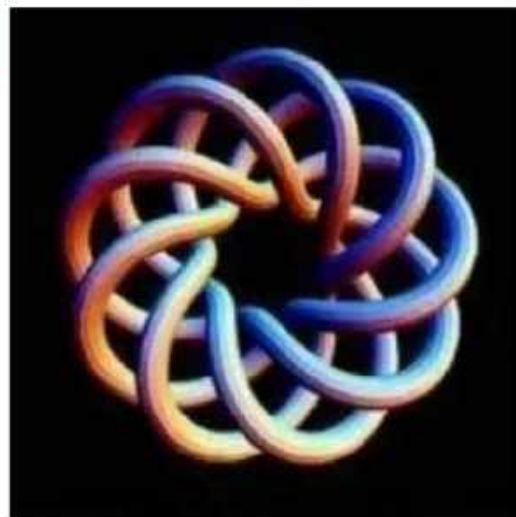


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This is to certify that S. Usharani Mother Teresa Women's University, Kodaikanal has participated and presented a paper titled *Load Balancing and Priority based Scheduling Algorithm for Data De-Duplication using Cloud Computing* in *Two days International Conference on Computing and Intelligent System (ICCIS'21)* jointly organized by the Department of Computer Science / Computer Applications / Information Technology / Computer Technology, held during *25<sup>th</sup> to 26<sup>th</sup> August, 2021.*

  
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**Chapter Title:** BIG DATA ANALYTICS: STREAM PROCESSING IN IoTSG

Mr. B. Sudhagar  
Head, Operations

Mrs. Jayalakshmi  
Director, IOTA

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## CHAPTER 7

### BIG DATA ANALYTICS: STREAM PROCESSING IN IoTSG

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2Assistant Professor, Trinity College for Women, Namakkal.

3Assistant Professor, Kristu Jayanti College, Bengaluru.

#### **Abstract**

This chapter presents a discussion of stream processing Big Data analytics and Internet of Things (IoT) with Smart Grid (SG) technology. The beginning of this chapter describes the characteristic features of these three technologies. In current scenario there are huge volumes of data have been formed that is being processed by big data analytics technology and the usage of Internet of things (IoT) devices are also increased. Yet, such data are not valuable without systematic power. Numerous big data, Internet of Things, Smart Grid and systematic solutions have enabled people to obtain valuable insight into enormous data generated by IoT devices. In the smart city, there are many IoT devices continuously produce a stream of data, which has to be analyzed within minimum period of time. In the developing environment applications of Internet of Things (IoT), beside with their capacity to bring together all data from sensors, the best part is to manage the big data too. For this purpose, stream processing big data technology is used to handle those real time continuous data. Smart Grid is an electrical grid that has the purpose of managing the flow of data/electricity via two-way communication which plays an important role of monitoring and managing things remotely. After that, possibilities of integrating these three technologies are discussed. IoTSG is a biggest IoT open adaptive Eco system that bridges the gap between IoT and emerging technologies. For interesting part, the end of the chapter is being enclosed with the future scope of big data analytics with IoTSG.

**Keywords: Big data, Smart Grid, Sensors, Internet of things, Remote devices.**

#### **1.1 Introduction**

Big data deals with large volume of data and management of those vast data. Now-a-days on the other hand, the Internet of Things grown a lot with huge applications on it, with their capacity collecting and also managing the big data velocity dimension. Smart Grid is an electrical grid that has the

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## Contents

### Preface

1. Sr. Dr. A M Jansi FSAG ----- 6-7  
Ephemeral
2. R. Showmya ----- 8  
A Marvellous Creation
3. Ratisha R. Sapre ----- 9-10  
A Moment
4. AhlaIqbal ----- 11  
Girl
5. Mr. GaneswarPatra ----- 12-13  
Gone Are the Days
6. Saatvik Mannav ----- 14  
Heaven Sent: A Baby to Love
7. Malarselvi ----- 15  
Desirable Days
8. Mr. V. Heymonth Kumar ----- 16-17  
Ode to Imagination
9. Adwita Singh ----- 18  
My Mother
10. V. Nithiya Parameswari ----- 19-20  
Recent India's Rigid Realities
11. Shirsak Ghosh ----- 21  
Perceptions of Reality
12. R. Sinaga ----- 22  
Nature
13. Sushama Naresh Gosavi Morajkar ----- 23  
The Voice Within
14. Dr. P. Scethalaxmi ----- 24  
Lesson to Learn
15. M. Mahalaxmi ----- 25  
It was a Cloudy and a Dark Day
16. M. Evanjaline Nightingale ----- 26-27  
Ripples
17. Dr. R. Rita Yasodha ----- 28  
Petals of Roses
18. Biney O G ----- 29  
The Wings

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Texts And Contexts



**Ms. S POORNIMA**

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She has presented nearly 30 Papers both in National and International Conferences, published 20 Articles in National and International Books and Journals and actively participated more than 200 seminars, webinars, FDPs and Workshops.

With 9 years of Teaching Experience, She is Research Guide, Nodal Officer, and Coordinator of Various Committees and Cells.

**NEEDS MORE WOMEN ENTREPRENEURS FOR PRODUCTION OF  
KALLIDAIKURICHI PAPPAD**

**Dr. M.R. Lakshiminarayanan**

Principal & Associate Professor in Commerce, Trinity College for Women (Arts and Science),  
Namakkal - 637 002, Tamil Nadu state.

**Abstract**

More or less 48% of population is female in India. Agonizingly, just 14% of women's are engaged in this entrepreneurship. Indian cottage industries are destined to play an important role in the economic development of our country. It provides employment opportunities, protection of cultural heritage in addition to dispersal of Indian activity into the backward areas. Particularly, Pappad making is one of the cottage industries in Kallidaikurichi (located in Ambasamudram Taluk, Tirunelveli District Tamil Nadu state). Kallakurichi Pappad is very famous for all over the world. Our Government of India has defined women entrepreneurs based upon women's contribution in equity and employment of a business firm. Our country requires more job creators than job seekers. At present, many females are participated in these cottage industries. We motivate more women for this entrepreneurship of Pappad Production. We must uplift our women having the status of entrepreneur of Pappad production in Kallidaikurichi.

**Introduction:-**

Women constitute close to 50% of the world's population. On the authority of as their social status is concerned, they are not dealt with as equal to men in a lot of areas. All the same, women are treated on par with men in all most all of the western countries. Unfortunately, it is very less in India. They are so many barriers to growth and development for women in India. A girl child depends on father, a wife depends on husband and mother depends on son.

There is a sea transform between Indian women of 1950 and the Indian women in this day and age. Women perform dynamic roles in the society, as mother, sister, wife, daughter, teacher, political leader, public, servant, and so on, and support for national development.

SOCIAL, ECONOMIC, EDUCATIONAL AND ENVIRONMENTAL IMPACT OF COVID-19 ISSUES AND CHALLENGES

# A COMPENDIUM OF ONLINE EDUCATION IN COVID 19 LOCKDOWN PERIOD

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Principal & Associate Professor  
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Trinity College for Women, (Arts and Science),  
Namakkal – 637 002, Tamil Nadu

## Abstract

Corona virus is severely affected in all most of the countries. Especially, our Indian Economy is highly affected because of COVID 19. For the past 7 months, all the educational institutions are closed. At present, our system of Indian education is transferred to E-Learning mode. However, rural and hill stations have been greatly disturbed on account of online education. Unavailability of modern android mobiles, shortfall of digital literacy & infrastructural support, lack of familiarity in usage of touch screen mobile and absence of data network are the problems of these students. If the Corona virus still goes on expanding phase, then the students must get prepare to face the online examinations for the forthcoming days also. It is completely incurable in this network mode of education for our student's community because of unavailability of resources an also failure in interaction with faculty members and students. Especially, poor students are suffered a lot. Online Education is not a substitute to formal education.

**Keywords:-** COVID – 19 – Education Sector – Online Learning – Problems for rural and hill station students – Future of Education.

## Introduction

Corona Virus is one of the pandemic disease. It was strongly predicted until March 2020 that a virus named corona (originated from China) will not affect our country India, since it lies in high temperature zone unlike China and USA. But all those predictions were failed when COVID 19 enters our country and not only affected numerous people but also caused many deaths (As the death rates are increasing day by day – 3.4% on March 2020). Apart from that, the pandemic COVID 19 has severely deteriorated the Indian economy with fall in all the sectors of income like industries, trade, etc., and it also influenced the people of all walks of life.

## Online learning

Especially, from last 7 months, the education rendered to students were only through online classes. Once, it was restricted for the students to use their mobile phones in classes. But now – a - days, the usage of mobile phones have been made mandatory due to COVID 19. In order to provide continuous education to students, the educational institutions were forced to choose the online mode of learning. As a result of COVID 19, many countries whole education system are moved and shifted into a virtual mode. As per developed countries point of view, our system of Indian education is repeated the subject of debate over outdated syllabi, lack of standardization, rote learning, talk and chalk method, shortage of quality of teachers and lack of infrastructure. How to it possible for pursuing education through online mode? This is a million dollar question.

## Lack of income

Due to COVID 19 the income of almost all the families are hardly sufficient. They further face the problems of loss of employment, reduction in salary and retrenchment of jobs



# CUSTOMER FRIENDLY BANKING SERVICES

**Dr. M.R. Lakshiminarayanan**

Principal & Associate Professor  
PG and Research Department of Commerce,  
Trinity College for Women (Arts and Science),  
Namakkal – 637 002.

## *Abstract*

*In the earlier, banking industry was using a traditional system with manual work. There has been a great revolution in the banking sector in the past few years and it is bound to evolve further. Information Technology has had a big impact on the Indian Banking system. Upgrading in technology employ innovations in a fast rapid and speed in our day-to-day life. Presently, we can access many banking services online. Now, we easily book our air ticket, bus ticket, cinema ticket, etc., through the online. The major banks in India are increasingly and growingly supplying services through electronic channels like internet banking, tele banking, mobile banking and Automated Teller Machines (ATM's). Especially, some of the leading banks in India are started door step banking services for the benefit of their customers. Technology change is inevitable. Bank has outsourced a number of its services such as ATM operations, services & maintenance, card operations, call center operations, maintenance of hardware, security services, data center and software support and more. Technology services of banking sectors are very helpful for all customers during the COVID-19 lock down period. We encourage our innovations of recent banking sectors.*

**Key words:-** Digital World – Modernizing Banking Sector – Online Banking/E Banking – Doorstep Banking – Satisfaction of customer's needs.

## **Introduction**

Bank play a significant role in the economy for offering a service of our people. Bank has been in existence since human society has commenced the business or trade. Around 2000 Before Christ the business owners/merchants in India gave grain loans to farmers, traders, etc., to aid them in business. The banking sectors are backbone of our society.

Once, there exists a though that the banks are connected only with men who are very prosperous and much knowledgeable. Because, if a person wishes to deposit or withdraw money from the bank, he must visit only the specified bank branch in

  
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