ಬಿ.ಎಂ.ಎಸ್. ತಾಂತ್ರಿಕ ಮತ್ತು ನಿರ್ವಾಹಣಾ ಮಹಾವಿದ್ಯಾಲಯ
(ವಿ.ಟಿ.ಯು. ಅಡಿಯಲ್ಲಿನ ಸ್ವಾಯತ್ತ ಸಂಸ್ಥೆ)
BMS INSTITUTE OF TECHNOLOGY & MANAGEMENT
(Autonomous Under VTU)

RESEARCH COMPENDIUM 2023

ISE Dept.
Transform Here

DEPARTMENT OF INFORMATION SCIENCE & ENGINEERING

Department of Information science and Engineering (2023)

VISION

Emerge as centre of learning in the field of information science & engineering with technical competency to serve the society.

MISSION

To provide excellent learning environment through balanced curriculum, best teaching methods, mentoring and industry institute interaction.

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3.1.2	Hybrid Cloud-Based Privacy Preserving Clustering as Service for Enterprise Big Data.
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3.2.7	Early recognition of Alzheimer's disease using machine learning.
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3.3.1	Secure Data Education: Leveraging Big Data for Enhanced Academic Performance and Student Success in Educational Institutions.
3.3.2	A survey of use of block chain for storing medical health records.
3.3.3	A Survey on Big Data in Cyber Security.
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3.3.15	A Comprehensive Survey on Weed Identification in Agriculture using Machine Learning.
3.3.16	An Efficient Machine Learning Approach for Apple Leaf Disease Detection.
3.3.17	A Design of Highly-Secured Map Chaotic Encryption Scheme for VANET Communication
3.3.18	An Ameliorated Methodology for Water Supply and Management Using Binary Trees
3.3.19	Simplifying Structure and Pattern in Complex Social Networks Using Graph Isomorphism.
3.3.20	Optimizing Task Distribution Systems: A Comparative Study of Micro-Task Job Replication, Accuracy, and Budget Constraints.

About Institution

In view of the growing demand for technical education and with the goal of establishing a premier technical education on par with international standards, a technical institution by name 'BMS Institute of Technology and Management' was established in 2002. Currently, BMSIT&M offers nine UG, four PG programs and Ten programs have been recognized as research centers under VTU. All our eligible programmes are NBA accredited and NAAC accredited with 'A' grade. BMSIT&M considers research and consultancy to be of equal importance as academics for the betterment of the institution. This culture has been embraced well by the faculty members at BMSIT&M through quality publications. In this report, we present a brief review about the publications of Information Science and Engineering, BMSIT&M.

Vision

"To emerge as one of the nation's finest technical institutions of higher learning to develop engineering professionals who are technically competent, ethical and environment friendly for betterment of the society."

Mission

"Accomplish stimulating learning environment through high quality academic instruction, innovation and industry – institute interface."

Department of Information Science and Engineering

The Department of Information Science and Engineering started in the Year 2010 with an approved intake of 60 and enhanced to 120 from the academic year 2018-19, 180 from the academic year 2019-20 and 240 in the year 2023-24. The Department has qualified and dedicated faculty members who practice Outcome Based Education (OBE) in the academic deliverables. The faculties have published research articles in various National, International, IEEE Conferences, and Journals which are indexed in SCOPUS, Web of Science, and other prestigious indexing research databases.

The department has modern laboratories to serve the teaching and research needs of the students as well as faculty members. The department has been proactively organizing conferences, workshops, expert lectures, and student-centric activities to encourage students and faculty to instil lifelong learning. Some of our students are working on consultancy projects along with faculty members. The staff are encouraged to attend the 10 days internship to bridge the gap between the academics and industry. The department has an admirable research ambiance.

The Department has adopted learner centric approach to groom the students in the right direction. It has more than 200+ research articles published in various national/international conferences and Journals. Our Students have consistently demonstrated the excellent placement track record of above 90 percent. They have demonstrated a high level of success at pursuing post graduate studies at top universities of the world as per QS World University Rankings. Few of our Students have turned into successful entrepreneurs and running their successful business in the areas of Software Services and allied areas.

From HOD's Desk

It is my pleasure to present the forth edition of Research Compendium of the Department of Information Science & Engineering. The main objective of the research compendium is to collate all the research contributions by our faculty members and students. It is evident that the Department is in-line with the on-going activities by the faculty members to cater the needs of industry to fill the gap between Industry and Institute. I hope this compendium continues its service to help the student community & faculty fraternity and attract more readers and provide an illuminating platform for the research community. I appreciate the efforts endorsed by all the faculty members and students of the department for their contribution towards the fourth edition of Department Research Compendium. I wish all the research community mmebers for their active participation and keep continuing.

Dr. Manjunath T.N

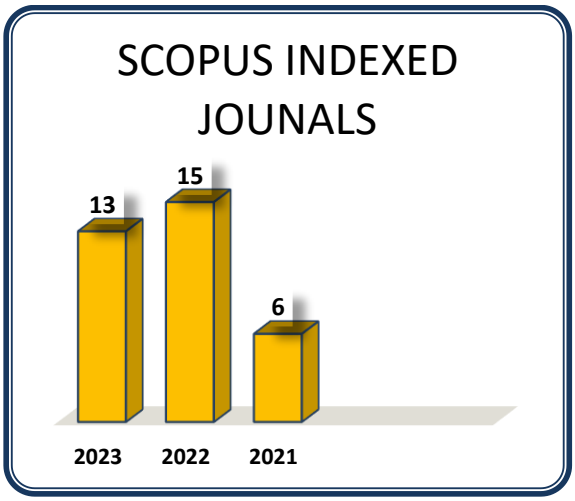
Editorial Statement

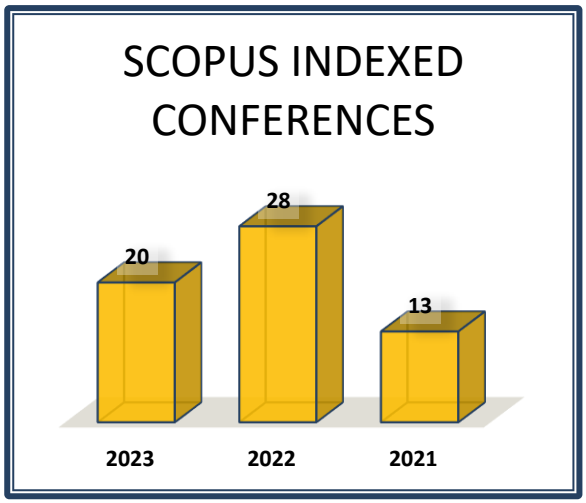
It's my pleaseure to be part of Editorial team for this Research Compendium 2023, published by the Department of Information Science & Engineering. The main objective of this research compendium is to motivate all the stakeholders and the research community to get themselves actively involved in research. It comprises of publication summary for past four years, citation details of faculty, and publications in Scientific Journals/Conferences for the academic year 2023. I whole heartedly thank all the faculty members for their contribution towards research compendium 2023.

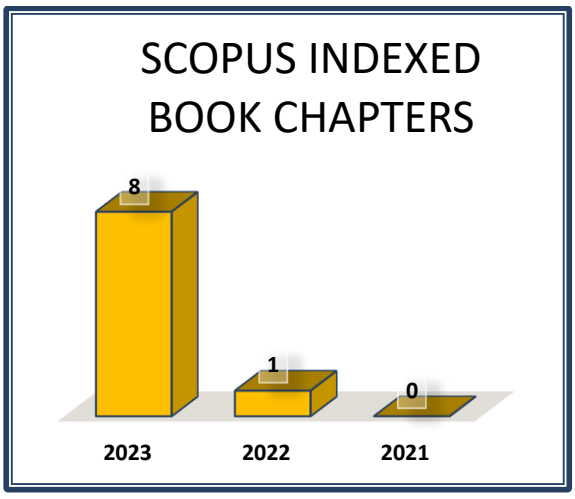
Dr.Shoba M
Research Coordinator

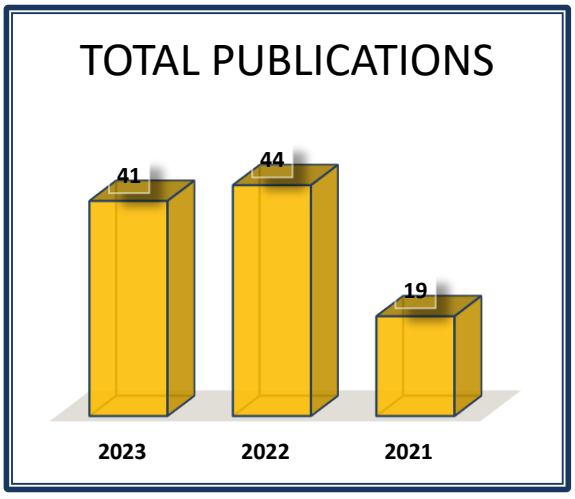
1. Research Publications Summary

SCOPUS INDEXED FACULTY PUBLICATIONS COUNT YEAR WISE														
Sl. No.	Name of the Faculty Member	2023			2022			2021			2020			TOTAL
		JOURNAL	CONFERENCE	BOOK CHAPTER	JOURNAL	CONFERENCE	BOOK CHAPTER	JOURNAL	CONFERENCE	BOOK CHAPTER	JOURNAL	CONFERENCE	BOOK CHAPTER	
1	Dr Manjunath T N	2	2	1	1	3		1	1					11
2	Dr. Pushpa S K		1						1					2
3	Dr. Sudhamani M V													
4	Dr. Usha B A		1											1
5	Dr. Anjan Krishnamurthy			1	1	2	1							5
6	Dr. Sheela Kathavate					2								2
7	Dr. Surekha K B					1								1
8	Dr. Geeta Amol Patil	1	1						1					3
9	Dr. Rakesh N					3								3
10	Dr. Veena N	1	1			1			1		1			5
11	Dr. Shoba M	1	1											2
12	Dr. Prakash GL		1		1									2
13	Prof. Chetana. C			1										1
14	Dr. Drakshaveni G	1		1	1									3
15	Prof. Mahalakshmi S				2	2		2						6
16	Dr. Shanthi D L	1			1			1	3					6
17	Dr. Chandrashekar K T			1	1									2
18	Dr. P Sudarsanam					3								3
19	Dr. GireeshBabu C N		1		1			1	1					4
20	Prof. Ambika R S					1								1
21	Dr. Swetha M S			2	1	4		1	2		1			11
22	Dr. Vinutha K	1	1		1				2					5
23	Dr. Ravikumar B N	1	1		1									3
24	Dr. Narasimhamurthy M S	2	1											3
25	Dr. Mohan BA		1			2								3
26	Dr. Anil Kumar					1								1
27	Dr. Savitha S		1			1								1
28	Dr. Basavaraj GN	1			1									2
29	Dr. Karthik SA		2	1	1	1								5
30	Dr. Kshama SB		2		1	1								4
31	Dr. Kantharaju V	1	1											2
32	Dr. Kalaivani Y S													
33	Dr. Harishkumar N		1											1
34	Dr. Srinivas B V													
35	Prof. Bhavya G.								1					1
	TOTAL	13	20	8	15	28	1	6	13	0	2	0	0	


SCOPUS INDEXED JOUNALS
13
15
6
2023
2022
2021


SCOPUS INDEXED CONFERENCES
20
28
13
2023
2022
2021


SCOPUS INDEXED BOOK CHAPTERS
8
1
0
2023
2022
2021


TOTAL PUBLICATIONS
41
44
19
2023
2022
2021

2. Citation Details of faculty

SL. No	Name of the Faculty	Citations 2023*	Citations 2022	Citations 2021
1	Dr Manjunatha T N	48	42	29
2	Dr Pushpa S. K	13	11	5
3	Dr Sudhamani M V	9	13	10
4	Dr Usha B A	11	10	7
5	Dr Anjan Krishnamurthy	5	9	8
6	Dr Sheela Kathavate	6	1	1
7	Dr Surekha K B	1	1	1
8	Dr Geeta Amol Patil	5	5	6
9	Dr Rakesh N	18	31	5
10	Dr Veena N	12	7	1
11	Dr Shoba M	1	1	3
12	Dr Prakash G L	2	9	4
13	Dr Drakshaveni G	1	1	1
14	Prof. Chethana C	15	21	2
15	Prof. Mahalakshmi S	2	5	1
16	Dr. Shanthi D L	4	10	3
17	Dr Chandrashekhara K T	7	1	2
18	Dr P. Sudarsanam	2	3	2
19	Dr Gireesh Babu C N	7	1	2
20	Prof. Ambika Rani Subhash	1	1	1
21	Dr Swetha M S	19	12	18
22	Prof. Vinutha K	2	3	1
23	Prof. Ravi Kumar B N	2	1	1
24	Dr. Narasimha Murthy M S	1	1	1
25	Dr. Mohan B.A	7	8	2
26	Dr. Anil Kumar	1	1	1
27	Dr. Savitha S	3	1	4
28	Dr. Basavaraj G N	1	6	1
29	Dr. Karthik S A	2	6	3
30	Dr. Kshama S B	1	2	1
31	Dr. Kantharaju V	4	3	1
32	Dr. Kalaivani Yenamandram Sathyanarayana	2	3	2
33	Dr. Harish Kumar N	3	6	7
34	Prof. Srinivas B V	1	1	1
35	Prof. Bhavya G	1	1	1
	TOTAL	**221**	**237**	**138**

3. RESEARCH PUBLICATIONS FOR THE YEAR 2023

Dr. Manjunath T.N , HOD, Professor , BMSIT&M
Scopus Id 57205117286

INTERNATIONAL JOURNALS with Scopus Indexed

1.	**Manjunath Thimmasandra Narayanappa, Deepa Yogish, S. Mahalakshmi, H.K. Yogish** Published a paper title "Smart question answering system using vectorization approach and statistical scoring method" Volume 80, Part 3, 2023, Pages 3719-3725 https://doi.org/10.1016/j.matpr.2021.07.369

8/7/23, 3:00 PM Smart question answering system using vectorization approach and statistical scoring method - ScienceDirect

ScienceDirect

Materials Today: Proceedings

Volume 80, Part 3, 2023, Pages 3719-3725

Smart question answering system using vectorization approach and statistical scoring method

T.N. Manjunath [a], Deepa Yogish [b], S. Mahalakshmi [a], H.K. Yogish [d]

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https://doi.org/10.1016/j.matpr.2021.07.369

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Abstract

In this digital era, internet users are increasing day by day to extract information related to various fields such as health, economic, educational, politics and daily needs from Information Retrieval Systems (IRS) such as Google, Ask, Yahoo etc. Information Retrieval (IR) is a conventional method which depends on metadata searching method that is searching of adocuments for information within documents and information about documents. Lot of research in the IR area improves accessing the quality of information. Most of the search engines such as Google, Yahoo, Ask Jeeves depends on keyword based query processing mechanism internally which can't handle natural language questions which results in returning long list of documents for a query. The task of users is to manually explore each document to retrieve correct answer which is a time consuming process. To overcome the problems of conventional search engines, smart question answering system comes to play. The objective of Smart Automated Answering system is to impart accurate and valid answers to user question in natural language rather than set of full documents.

The Smart Question answering system which accepts user question in Natural language in specific domain and provide short and precise answer using Natural language processing technique, used for pre-processing, normalized term weighting-TF-IDF with cosine similarity approach for document retrieval and enhanced BM25 ranking function to extract answer. The main focus is on decreasing the response time, designing ranking function and giving the pertinent responses to the users' intent. The system achieved an overall Precision of 93.2%, Recall of 84.3% and F-measure of 88.5% with 80% of Accuracy.

2. **Amogh Pramod Kulkarni, Manjunath Thimmasandra Narayanappa** Published a paper title "Hybrid Cloud-Based Privacy Preserving Clustering as Service for Enterprise Big Data" International Journal on Recent and Innovation Trends in Computing and Communication. DOI: https://doi.org/10.17762/ijritcc.v11i2s.6037

International Journal on Recent and Innovation Trends in Computing and Communication
ISSN: 2321-8169 Volume: 11 Issue: 2s
DOI: https://doi.org/10.17762/ijritcc.v11i2s.6037
Article Received: 10 November 2022 Revised: 18 December 2022 Accepted: 05 January 2023

Hybrid Cloud-Based Privacy Preserving Clustering as Service for Enterprise Big Data

Amogh Pramod Kulkarni[1], Dr. Manjunath T N[2]
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Asst. Prof., dept. of computer science & engineering, Presidency University, Bengaluru, kulkarni84@gmail.com .
[2]Professor, Department of Information Science and engineering, B.M.S Institute of Technology and Management, Bengaluru,
manju.tn@gmail.com.

ABSTRACT

Clustering as service is being offered by many cloud service providers. It helps enterprises to learn hidden patterns and learn knowledge from large, big data generated by enterprises. Though it brings lot of value to enterprises, it also exposes the data to various security and privacy threats. Privacy preserving clustering is being proposed a solution to address this problem. But the privacy preserving clustering as outsourced service model involves too much overhead on querying user, lacks adaptivity to incremental data and involves frequent interaction between service provider and the querying user. There is also a lack of personalization to clustering by the querying user. This work "Locality Sensitive Hashing for Transformed Dataset (LSHTD)" proposes a hybrid cloud-based clustering as service model for streaming data that address the problems in the existing model such as privacy preserving k-means clustering outsourcing under multiple keys (PPCOM) and secure nearest neighbor clustering (SNNC) models, The solution combines hybrid cloud, LSHTD clustering algorithm as outsourced service model. Through experiments, the proposed solution is able is found to reduce the computation cost by 23% and communication cost by 6% and able to provide better clustering accuracy with ARI greater than 4.59% compared to existing works.

Keywords: - Clustering, cryptographic, cloud, hash, LSHTD

Book Chapter

1. **Manjunath, T.N., Pushpa, S.K., Hegadi, R.S., Ananya Hathwar, K.S.** Published a Book Chapter title "A Study on Big Data Engineering Using Cloud Data Warehouse" Data Engineering and Data Science: Concepts and Applications, 2023, pp. 49–69 First published: 05 September 2023 https://doi.org/10.1002/9781119841999.ch3

A Study on Big Data Engineering Using Cloud Data Warehouse

T. N. Manjunath, S. K. Pushpa, Ravindra S. Hegadi, K. S. Ananya Hathwar

Book Editor(s):Kukatlapalli Pradeep Kumar, Aynur Unal, Vinay Jha Pillai, Hari Murthy, M. Niranjanamurthy

First published: 05 September 2023
https://doi.org/10.1002/9781119841999.ch3

Summary

In the current smart, Internet of Things world, millions of devices are connected around us for effective communication. A huge volume of data is getting generated, varying from gigabytes to brontobytes with a variety of data formats, storing all the acquired data in an on-premise Data warehouse has limitations due to storage capacity and homogeneous data formats compatibility. The internet revolution has brought us an entirely new communication and cloud model. We now have fast wireless connectivity for data transfer, messaging and web surfing, and we also perform extract, transform and Load (ETL) activities to the cloud data warehouse based on the client's requirements. The internet revolution has been the core inspiration for many new business ideas and models. The rise in online retailing business is strictly dependent on internet connectivity. Even consumers find online shopping convenient and time friendly. Internet communication is a must for urban life. Mobile internet helps us keep things handy and organized. We now can transfer or share a heavy size file from a portable handy device in a couple of minutes. A lot of businesses use internet for e-commerce, media site of a company, social media, Customer relationship management, Employee productivity management, etc., and due to this evolution, business faces a lot of issues with the storing of a large amount of data and analysing it over time. This is where Data Warehouse was born. Data warehouse is a central repository which is built to in-house the data acquired from various source systems in the enterprise business ecosystem. The intention is to support the decision makers with appropriate reporting facility to arrive at the right decisions to the right time. An on-premise data warehouse is built to handle online analytical processing with moderate cost for moderate business enterprises. After a while the businesses faced issues in installing the components to store lot of data on-premise and it was not cost-effective. To solve this problem, cloud data warehouse was evolved. We explored the best possible solutions to handle the limitations of on-premise data warehouse with comparative study.

INTERNATIONAL CONFERENCE with Scopus Indexed

1. **Parameshachari B.D., Prasad N A., Dhanraj, Manjunath T.N.** Published a paper title "Adaptive Voting Mechanism with Artificial Butterfly Algorithm based Feature Selection for IDS in MANET" 2023 IEEE International Conference on **Integrated** Circuits and Communication Systems, ICICACS 2023, 24-25 February 2023, **ISBN:**979-8-3503-9846-5, **DOI:** 10.1109/ICICACS57338.2023.10099861

2023 IEEE International Conference on Integrated Circuits and Communication Systems (ICICACS)

Adaptive Voting Mechanism with Artificial Butterfly Algorithm based Feature Selection for IDS in MANET

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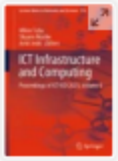
***Abstract*—Mobile ad hoc networks (MANETs) have gained more interest from consumers and academics than ever before thanks to the proliferation of wireless networks and the expansion of the benefits and uses of communication networks in general. MANETs are useful in a wide variety of settings since they don't rely on a centralised server or other hardware to relay messages or process data packets. It's one of the primary justifications for implementing MANET in many different domains. However, there are also numerous difficulties that have arisen as a result of these networks' rising popularity, with network security being one of the most crucial. There have been challenges with data transmission and reception due to MANETs' weak regulatory and security frameworks; network infiltration has been identified as one of the most pressing concerns. In MANETs, wireless nodes serve as relays and routers, connecting the source and sink nodes. Accordingly, it is now possible for rogue nodes to penetrate networks and destroy data packets. In order to cope with this issue, modern intrusion detection systems (IDSs) are utilised for remote monitoring of the functioning and actions of nodes present in wireless sensor networks. As well as being able to identify hostile nodes in the network, IDSs can often predict how such nodes will act in the future. In this research work, NSL-KDD dataset is used as an input data. SMOTE and Z-score method are used during pre-processing to remove the irrelevant features and normalize the data. The optimal features are carried out by Artificial Butterfly algorithm and then, finally, ensemble classifiers s. Multilayer Perceptron (MLP), Boosted Regression Trees (BRT) and finally, the adaptive voting mechanism is used to select the best classifier. The results proves that the proposed ensemble model achieved 97.16% of accuracy, where the existing models achieved nearly 95% to 96% of accuracy.**

***Keywords*—Intrusion Detection Systems; Artificial Butterfly algorithm; Adaptive voting mechanism; Mobile ad hoc networks; Boosted Regression Trees.**

the assistance of intermediate nodes, they face a number of challenges. Each node in MANET acts as a router or an intermediary system due to a sudden shift in the network topology; it can impact the whole network layout, and the data can miss it while the topology shifts [1-2]. Nodes that submit alerts can increase the system load latency; it's why we need to make sure there are no loops. In addition, every network is designed to include a collection of resources for some given purpose. To accomplish this aim, a series of services would be given to users of the network or to users of any device operating on the network. Users registered with the service are authorized to use the service in compliance with the protocol listed above. In fact, there are malicious users or adversaries present within or outside the network, which may also be registered users [3]. Their aim is to degrade or weaken the network infrastructure offered. And the involvement of hostile nodes in the way of data transfer will entail creating various network risks. Due to resource constraints, the presence of permanent security monitoring nodes in the network is almost impossible, and remote control of node activity in the network and establishing security demands in MANET are thus required [4, 5].

A (NIDS) is a tool used to keep tabs on all the goings-on in a network. The primary function of NIDSs is to identify potentially harmful nodes and to foresee network assaults [6]. In the event that a malicious node is found in the network, an alert is produced for further action. It is important to note that the effectiveness of an IDS is dependent on the sort of technology used to identify assaults by NIDS, and that many different strategies have been suggested for doing so [7]. Choosing relevant characteristics from the primary dataset is an important part of NIDS performance [8]. Optimizing IDS performance [9] often involves reducing the amount of characteristics included in the data collection (such as the behaviour of nodes and

2. **Shylaja, A.R., Shubhashree, D.A., Shrihari, M.R., Manjunath, T.N., Ajay, N.** Published a paper title " Secure Data Education: Leveraging Big Data for Enhanced Academic Performance and Student Success in Educational Institutions" International Conference on ICT for Sustainable Development September 2023 DOI:10.1007/978-981-99-4932-8_12



International Conference on ICT for Sustainable Development
ICT4SD 2023: **ICT Infrastructure and Computing** pp 111–124

Secure Data Education: Leveraging Big Data for Enhanced Academic Performance and Student Success in Educational Institutions

A. R. Shylaja, D. A. Shubhashree, M. R. Shrihari, T. N. Manjunath & N. Ajay

Conference paper | First Online: 26 September 2023

35 Accesses

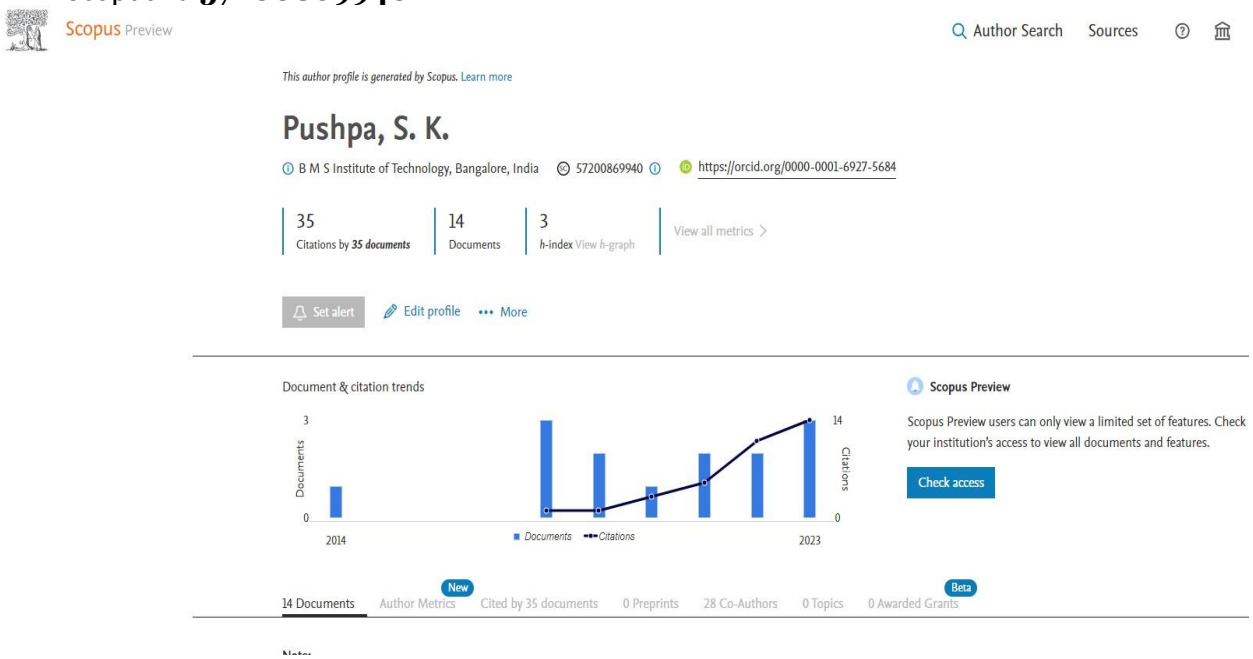
Part of the Lecture Notes in Networks and Systems book series (LNNS,volume 754)

Abstract

Big data applications are employed in a variety of industries, including academia, healthcare, marketing, industry, government, and public administration, among others, to address societal issues and progress society (Munshi and Alhindi in Big data platform for educational analytics, 2021). Big data in education has significant benefits since it can be managed at an infinite scale. Big data in education helps students achieve better grades, enhance the grading system, gain attention, and lower dropout rates (Wang and Yang in 2020 International conference on communications, information system and computer engineering (CISCE), 2020). The evaluation of student performance is based on their results on tests, evaluations, quizzes, projects, etc. By analyzing this data, mentors can recognize student behavior and performance and establish the best learning environment. The feedback is highly useful for enhancing the outcomes. Students' heart rates, facial characteristics, and behavioral clues may all be seen visually. Educational despite the number of students in institutions, big data makes it possible to create a specific curriculum for each student. With no compromises, this enables students to enroll in the classes they are interested in and progress at their own speed. All of this data on students' grades, tardiness in submitting tasks, and desire in learning aid mentors and institutions in pinpointing the precise causes of dropouts. The security and privacy of data created in universities, however, are the major drawbacks of big data applications in the educational industry. In this paper, we investigate how Hadoop employs Kerberos for authentication and authorization as well as how big data benefits students' academic performance. A network authentication system called Kerberos offers a safe authentication service based on reliable outside sources.

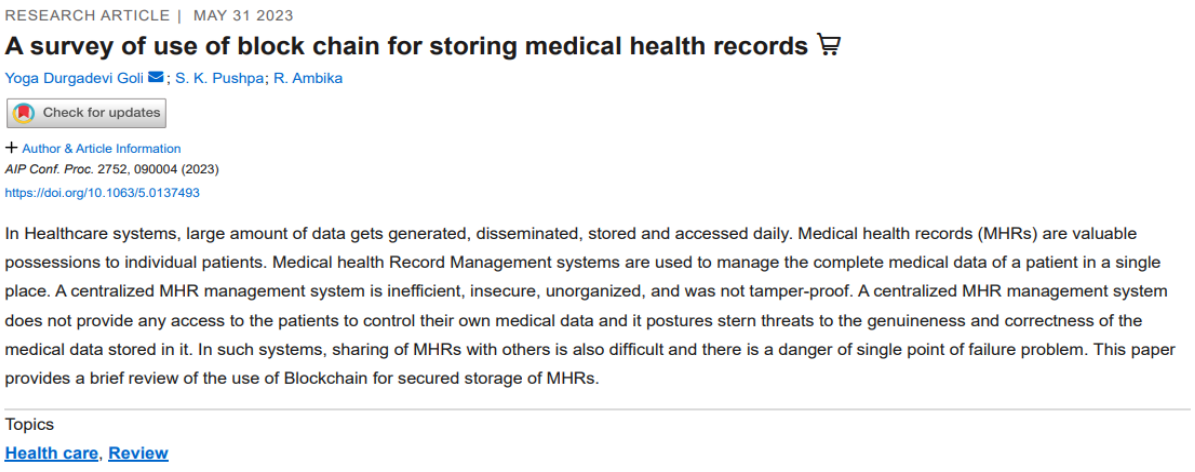
Dr. Pushpa S K, Professor , BMSIT&M

Scopus Id **57200869940**



INTERNATIONAL CONFERENCE with Scopus Indexed

1. **Goli, Y.D., Pushpa, S.K., Ambika, R.** Published a paper title" A survey of use of block chain for storing medical health records" AIP Conference Proceedings, Volume 2752, Issue 1, id.090004, 4 pp. May 2023 DOI: 10.1063/5.0137493



Book Chapter with Scopus Indexed

1. Manjunath, T.N., Pushpa, S.K., Hegadi, R.S., Ananya Hathwar, K.S. Published a Book Chapter title "A Study on Big Data Engineering Using Cloud Data Warehouse" *Data Engineering and Data Science: Concepts and Applications*, 2023, pp. 49–69 First published: 05 September 2023 https://doi.org/10.1002/9781119841999.ch3

Dr Sudhamani M V, Professor, BMSIT&M

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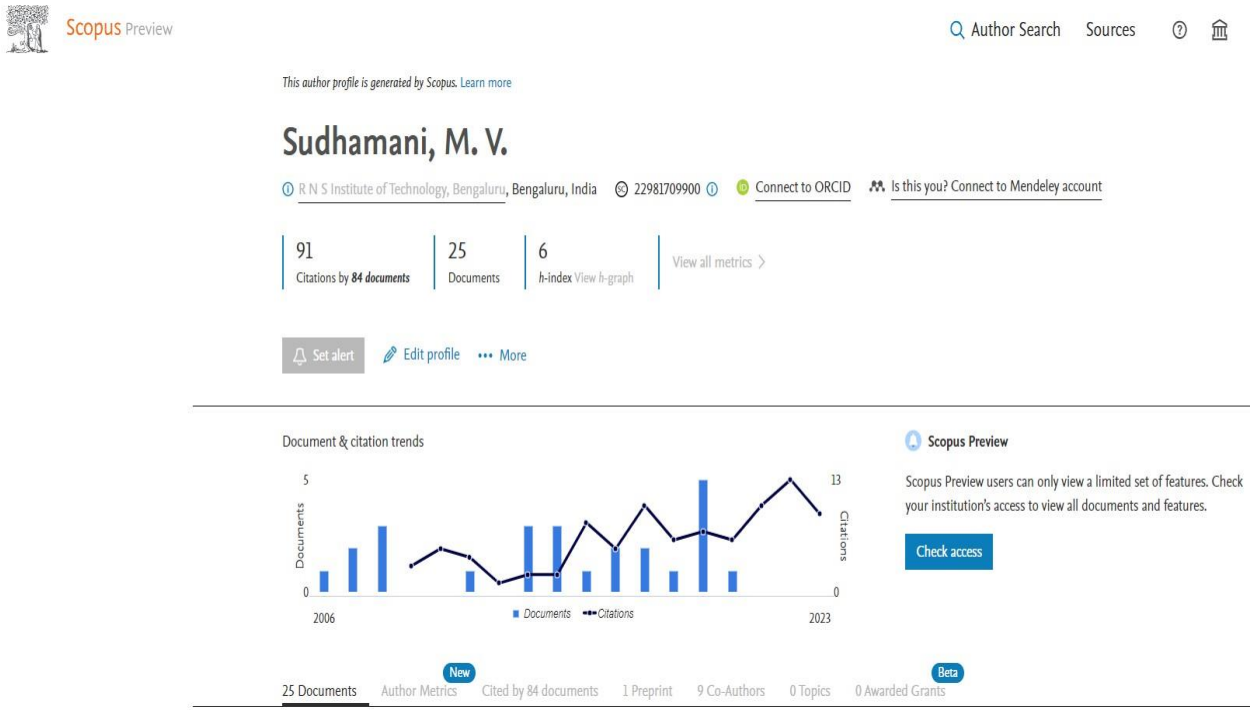

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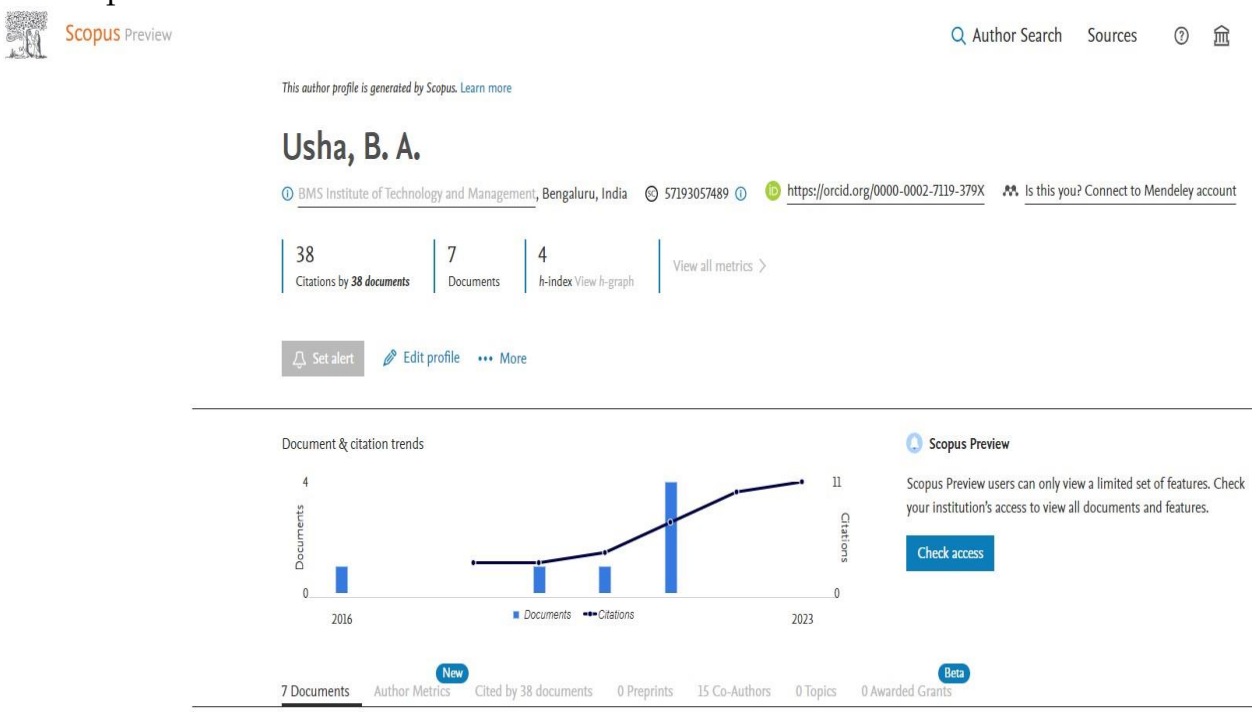
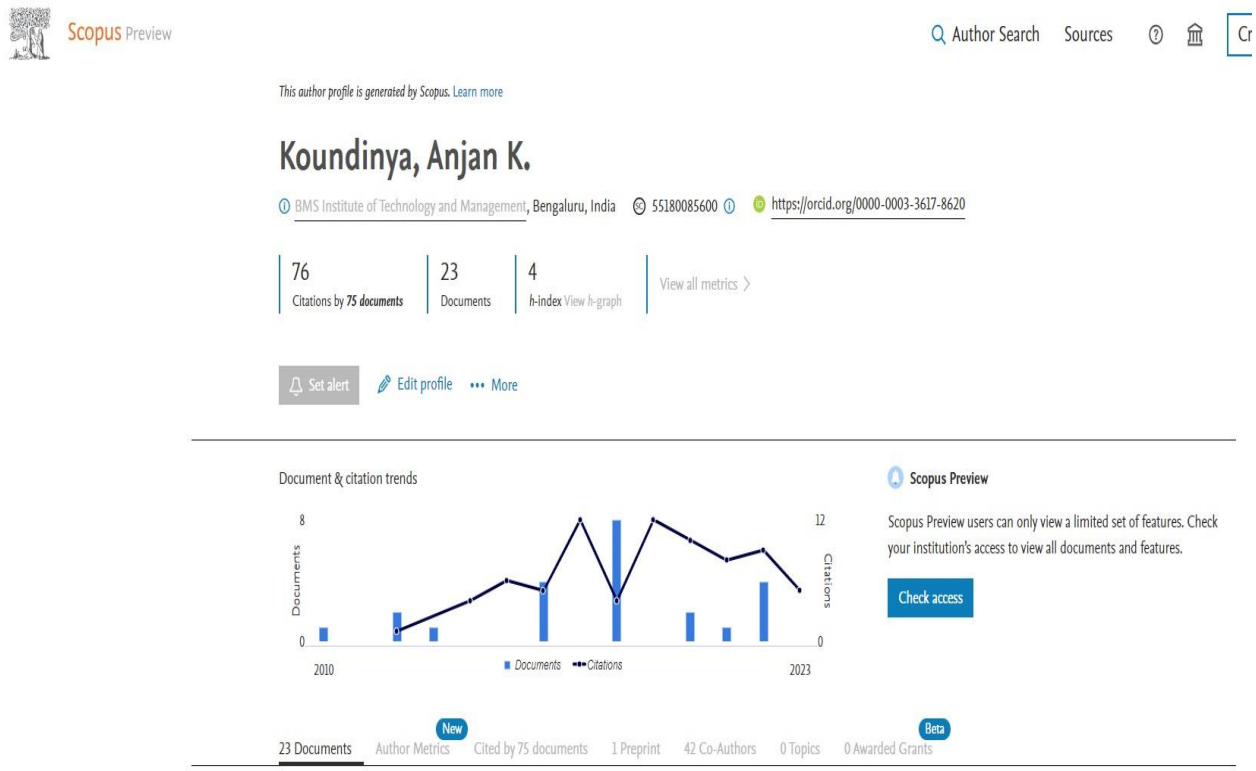


INTERNATIONAL CONFERENCE with Scopus Indexed

1.	**Dr. Usha B.A** Published a paper title "A Survey on Big Data in Cyber Security" 1st IEEE International Conference on Multidisciplinary Research in Technology and Management – MRTM 23, organized by New Horizon College of Engineering, Bengaluru on 22nd & 23rd September 2023.

Dr Anjan Krishnamurthy, Professor , BMSIT&M

Scopus Id 55180085600



Book Chapter with Scopus Indexed

1.	**Dr Anjan Krishnamurthy** Published a paper title "Early recognition of Alzheimer's disease using machine learning" 1st IEEE International Conference on Multidisciplinary Research in Technology and Management – MRTM 23, organized by New Horizon College of Engineering, Bengaluru on 22nd & 23rd September 2023.

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Chapter

Early recognition of Alzheimer's disease using machine learning

By Prajwal Nagaraj, Anjan K Koundinya, G Thippeswamy

Book Artificial Intelligence, Blockchain, Computing and Security Volume 1

Edition	1st Edition
First Published	2023
Imprint	CRC Press
Pages	5
eBook ISBN	9781003393580

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ABSTRACT

Alzheimer's Disease (AD), a neurological disorder, is the most common cause of dementia in those over the age of AD must be precisely and soon identified in order to halt the progression of this lethal condition. This article focuses on a machine learning method for MRI images to identify The condition Alzheimer's. The brain's hippocampus region is the fundamental objective of the recommended tactic. Use a Gray Level Concidence Matrix to extract the hippocampus region's textural characteristics, including entropy, uniformity, energy, contrast, correlation, and variance (GLCM). Using moment invariants, area and form elements are retrieved. A classifier is utilised to identify distinct phases of AD using error propagation (EBP) of an artificial neural network. An average accuracy of 86.8% is offered by the proposed technique.

< Previous Chapter Next Chapter >

Dr. Sheela Kathavate, Associate Professor , BMSIT&M
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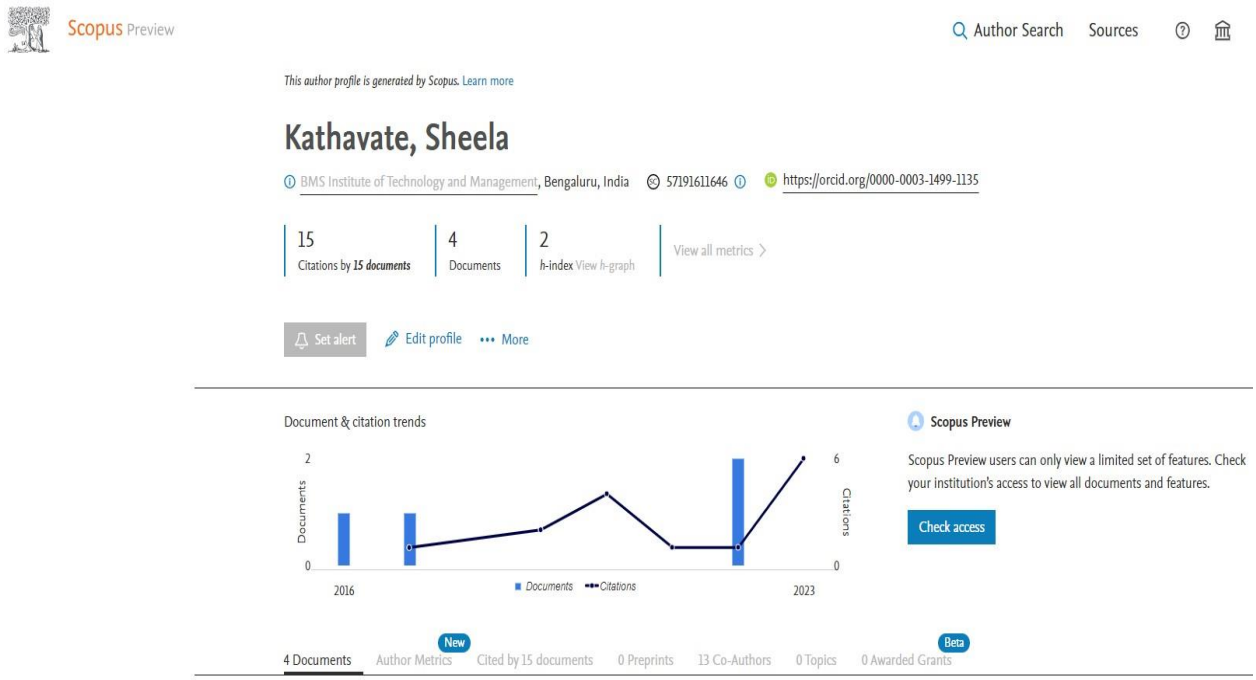

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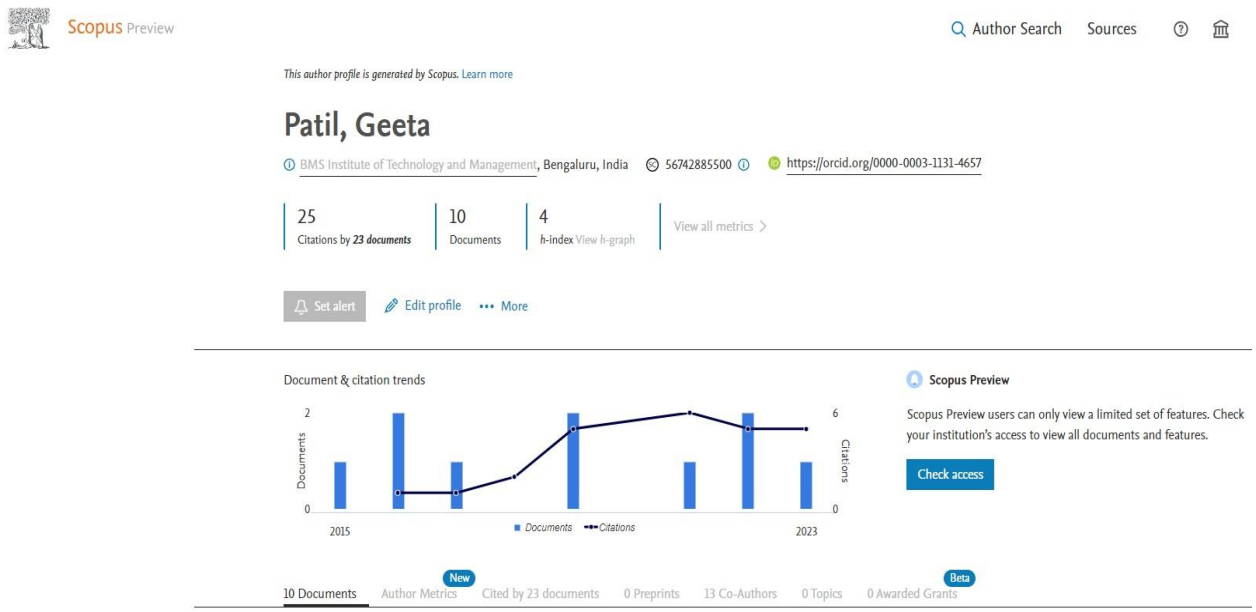

INTERNATIONAL JOURNALS with Scopus Indexed

1.	**Geeta Patil, Arun S. Nair , Pai, A.V., Raveendran, B.K., Punnekkat, S** Published a paper title "CAMP: a hierarchical cache architecture for multi-core mixed criticality processors " International Journal of Parallel, Emergent and Distributed Systems, Published online: 19 Dec 2023 DOI: https://doi.org/10.1080/17445760.2023.2293913

CAMP: a hierarchical cache architecture for multi-core mixed criticality processors

Arun S. Nair, Geeta Patil, Archit Agarwal, Aboli V. Pai, Biju K. Raveendran & Sasikumar Punnekkat

Received 22 Jul 2023, Accepted 01 Dec 2023, Published online: 19 Dec 2023

Cite this article https://doi.org/10.1080/17445760.2023.2293913 Check for updates

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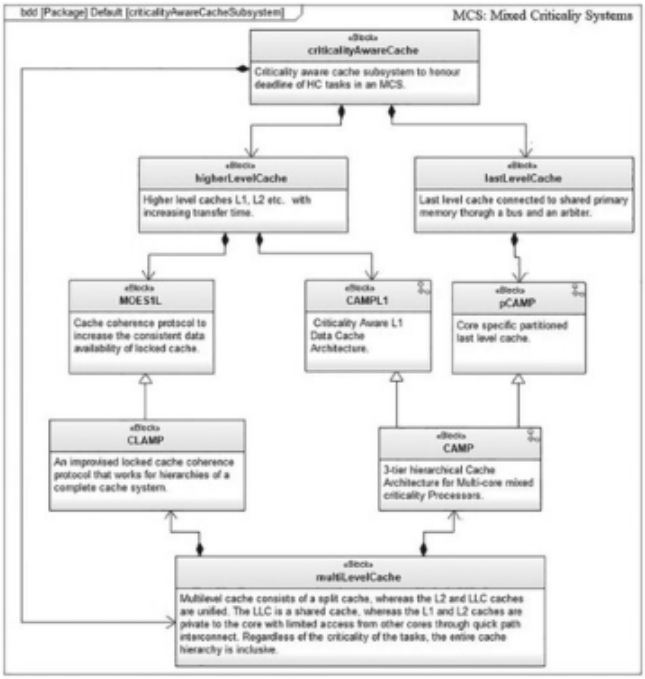
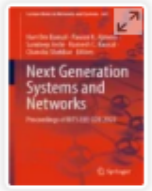
Abstract

CAMP proposes a hierarchical cache subsystem for multi-core mixed criticality processors, focusing on ensuring worst-case execution time (WCET) predictability in automotive applications. It incorporates criticality-aware locked L1 and L2 caches, reconfigurable at mode change intervals, along with criticality-aware last level cache partitioning. Evaluation using CACOSIM, Moola Multicore simulator, and CACTI simulation tools confirms the suitability of CAMP for keeping high-criticality jobs within timing budgets. A practical case study involving an automotive wake-up controller using the sniper v7.2 architecture simulator further validates its usability in real-world mixed criticality applications. CAMP presents a promising cache architecture for optimized multi-core mixed criticality systems.



INTERNATIONAL CONFERENCE with Scopus Indexed

1. **Nair, A.S., Pai, A.V., Patil, G., Raveendran, B.K., Punnekkat, S.** Published a paper title "CLAMP: Criticality Aware Coherency Protocol for Locked Multi-level Caches in Multi-core Processors" International Conference on Next Generation Systems and Networks, 371-381 First Online: 10 July 2023
DOI: https://link.springer.com/chapter/10.1007/978-981-99-0483-9_30



International Conference on Next Generation Systems and Networks
BITS-EEE-CON 2022: **Next Generation Systems and Networks** pp 371–381

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CLAMP: Criticality Aware Coherency Protocol for Locked Multi-level Caches in Multi-core Processors

Arun Sukumaran Nair, Aboli Vijayanand Pai, Geeta Patil, Biju K. Raveendran & Sasikumar Punnekkat

Conference paper | First Online: 10 July 2023

60 Accesses

Part of the Lecture Notes in Networks and Systems book series (LNNS,volume 641)

Abstract

Cyber-physical systems that combine sensing, computing, control and networking with physical items and infrastructure, such as automotive, avionics and robotics, are rapidly becoming mixed criticality systems (MCS). The increasing expectations for computing ability and predictable temporal behaviour of these systems necessitate substantial enhancements in their memory subsystem architecture. The use of locked caches to have predictable execution time is one such optimization. There is no comprehensive method in order to manage coherency in locked caches in any of the current cache coherence protocols like MOESI. CLAMP—A criticality aware coherency protocol for locked multi-level caches in multi-core processors is an updated variant of MOESI and as an extension of MOESIL, to improve the data consistency of locked caches. The work CLAMP proposes an improvised locked cache coherence protocol for multiple levels of cache in multi-core MCS, whereas MOESIL is restricted to two-level cache architecture. Experiments using real-time benchmark programs on CACOSIM reveal an average cache miss rate reduction of 18% for high-criticality jobs.

Dr Veena N, Associate Professor , BMSIT&M
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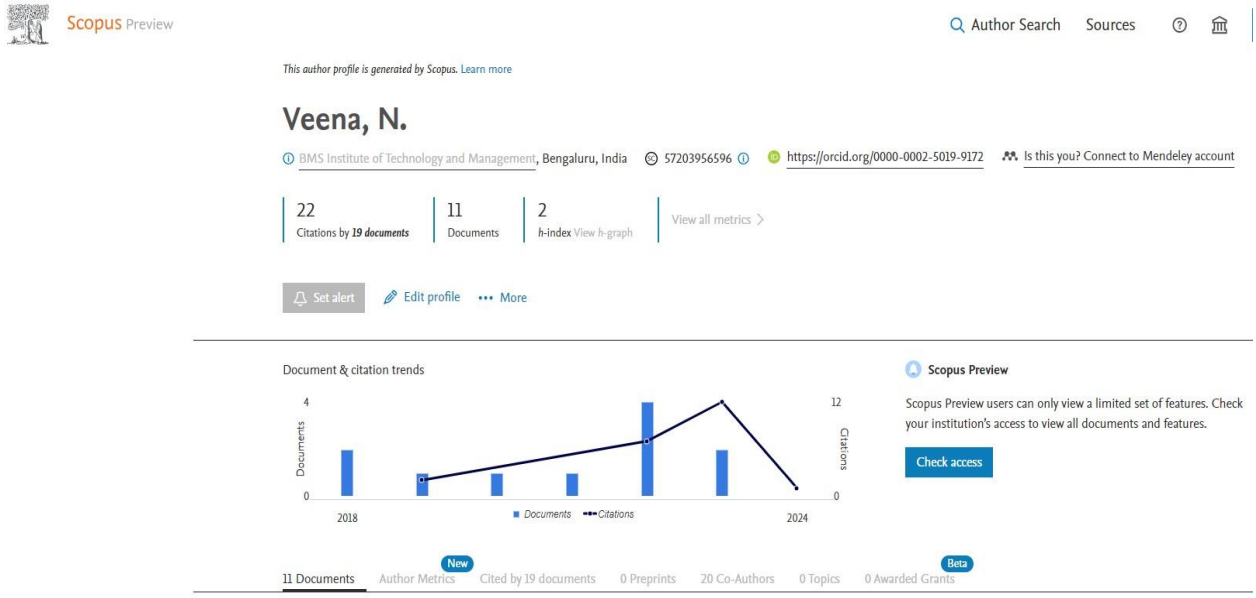

INTERNATIONAL JOURNALS with Scopus Indexed

1.	**Kumar M.G.V., Veena N., Čepová L., ...Balaram A., Elangovan M.** Published a paper title "Evaluation of the Quality of Practical Teaching of Agricultural Higher Vocational Courses Based on BP Neural Network" Applied Sciences (Switzerland), 2023, 13(2), 1180

applied sciences

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Evaluation of the Quality of Practical Teaching of Agricultural Higher Vocational Courses Based on BP Neural Network

M. Guru Vimal Kumar [1], Veena N [2], Lenka Čepová [3,*], M Arun Manicka Raja [4], Allam Balaram [5] and Muniyandy Elangovan [6,*]

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Abstract: Agriculture is the backbone of any developing or developed country that makes any living to survive. To make food available throughout the year, it is necessary to know about agriculture and the work and strategies involved. Hence, agricultural courses have to be introduced to higher education students. Additionally, agriculture-related methods are available in many higher education institutions for longer. However, students and teachers will face difficulties in real-time practical classes during certain challenging circumstances. These situations require the teacher to utilize trending technologies to improve the teaching and learning process and to make it more manageable. In this study, for this process, a novel neural network-based recognition algorithm (NN-RA) is implemented that works similarly to a backpropagation neural network (BP-NN) to provide a practical agriculture course. The proposed BP-NN is compared with the existing NN-RA, I-SC, and I-VDT algorithms based on the data transfer and signal-to-noise ratio. From the results, it can be observed that the proposed BP-NN attains a higher accuracy in data transfer of 99%.

Keywords: agriculture; higher vocational course; quality education; backpropagation neural network; artificial intelligence

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Citation: Kumar, M.G.V.; N, V.; Čepová, L.; Raja, M.A.M.; Balaram, A.; Elangovan, M. Evaluation of the Quality of Practical Teaching of Agricultural Higher Vocational Courses Based on BP Neural Network. *Appl. Sci.* **2023**, *13*, 1180. https://doi.org/10.3390/app13021180

INTERNATIONAL CONFERENCE with Scopus Indexed

1. **Veena N., Mahalakshmi S., Bhargava O.** Published a paper title "Human Trap Detection using Convolution Neural Networks" Proceedings - 7th International Conference on Computing Methodologies and Communication, ICCMC 2023, 2023, pp. 411–415 **DOI:** 10.1109/ICCMC56507.2023.10083927

Proceedings of the 7th International Conference on Computing Methodologies and Communication (ICCMC-2023)
IEEE Xplore Part Number: CFP23K25-ART; ISBN: 978-1-6654-6408-6

Human Trap Detection using Convolution Neural Networks

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***Abstract*— Natural calamities are the most common causes of disasters in different parts of the world, they can be either man-made, such as terrorist attacks, or natural (wildfires, landslides, floods, earthquakes etc.). India, as a country located on the seismic zone and the intertropical convergent point has been subjected to a variety of natural disasters, resulting in property damage, economic damage, and loss of life. This disaster creates a situation in which basic services must be provided to victims. Many people are dying in these disasters because they do not receive help immediately or later. This article proposes an intelligent robot by using wireless sensor networks to find human traps and automatically rescue them using Convolutional Neural Networks (CNN).**

Keywords—Human Trap, Convolution Neural Networks, Natural Disaster

I. INTRODUCTION

In this contemporary period, technical advancement has resulted in the construction of skyscraper structures and homes, increasing the danger of death from natural and man-made calamities. Many individuals perished as a result of being trapped under rubble, which the rescue crew is unable to locate. It is often hard to access specific areas of disasters in such disaster-stricken areas. Because of the low quality of design and construction, the issue is even worse in developing countries like India.

India has the second largest population which makes it heavily exposed to natural disasters. Because the country lies on a seismic risk zone and intertropical convergence point, the Indian subcontinent faces frequent atmospheric phenomena like heavy rains, floods, episodes of high heat, drought, etc. This also causes many buildings to collapse every year. It is estimated that, around 2000 people die every year in India due to poor construction and extreme weather conditions. This loss drastically reduces when technologies like object detection are applied to rescue the victims. Earthquakes, cyclones, tornadoes, and other natural disasters have claimed countless lives around the world in the twenty-first century.

beyond 72 hours. Given the air supply shortfall, health conditions, and other environmental issues,
this might be reduced even further. As a result, the rescue crew must locate individuals if direct access and exploration of the damaged or disaster location are not feasible, and can't rapidly get under the rubble.

Object detection has growing importance in computer vision which is a branch of computer science that focuses on the analysis of images. It is the process of computers looking at images, or frames from a video stream, to identify objects of interest and classify these objects.

Because object detection and image recognition are frequently cofounded, it's vital to understand the differences between the two.

A major cause of death of victims in disasters is often suffocation from the weight and lack of oxygen. Thus, rescuing the victims in the first few hours of an accident becomes extremely important. Object detection and image recognition is gaining importance in various fields. It is also proven to be very helpful. The motivation of our prototype can be given as follows-

1. To reduce the percentage of fatalities during calamities
2. To reduce the number of people trapped under debris
3. To reduce the emotional load and physical load of rescue team
4. To send real time alerts to the appropriate rescue team
5. To reduce the time between finding a trapped person and rescuing them.

To build a working, robust prototype that performs real-time object detection with good accuracy and use it during natural calamities.

II. LITERARURE SURVEY

In paper [2] the authors have discussed about how high-speed robots are been used for control theory so that they can be used to control various drives, devices and controlled algorithms. Here they have discussed about how to identify the human using the robot, they have used a pilot version of the remote-controlled robot that has a PIR sensor which can detect the presence of human and gives the notification. This

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K. Thanuja, M. Shoba, Kirankumari Patil Published a paper title "Epileptic Seizure Classification and Feature Optimization Technique Using Grey Wolf Algorithm on Dynamic Datasets" SN Computer Science volume 4, Article number: 311 (2023)

DOI:10.1007/s42979-023-01741-0

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Epileptic Seizure Classification and Feature Optimization Technique Using Grey Wolf Algorithm on Dynamic Datasets

K. Thanuja, M. Shoba & Kirankumari Patil

SN Computer Science 4, Article number: 311 (2023)

29 Accesses | Metrics

Abstract

Epileptic seizure (ES) is caused due to the unpredictable and imbalanced discharge of electric signals causing a muscle ruptures. The instance is critical if unattended medically. In the proposed paper, a feature optimization and classification technique is discussed. The technique is based on the dynamic feature set extraction and producing cluster based on categorization labels. The technique is structured on grey-wolf optimization algorithm in identifying the highlighted feature–attribute co-relationship. The technique has processed attribute inter-connectivity coordinates in creating a virtual mapping and labeling of cluster-heads to provide seizure severity. The technique has successfully adopted multi-dimensional datasets for improved performance and calibration under inter-dependent attribute-feature mapping. The technique has achieved 96.76% accuracy on trained datasets with 98.76% sensitivity and 97.86%

INTERNATIONAL CONFERENCE with Scopus Indexed

1.

Haripriya R, Vinutha C B, Shoba M Published a paper title "Genetic Algorithm with Bacterial Conjugation based Cluster Head selection for Dynamic WSN" 2023 International Conference on Network, Multimedia and Information Technology (NMITCON), **Year** 2023

2023 International Conference on Network, Multimedia and Information Technology (NMITCON)

Genetic Algorithm with Bacterial Conjugation based Cluster Head selection for Dynamic WSN

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***Abstract*— In Wireless Sensor Networks, nodes are randomly employed in the sensing area and there is no scope to replace batteries. The lifetime of the heterogeneous Wireless sensor networks (WSN) can be extended by adopting dynamic clustering algorithms. The prime feature of any clustering algorithm is to fundamentally regulate communication energy between the nodes and inturn reduce the energy consumed by individual node. However, the dynamic nature of nodes and channel characteristics is a major challenge to be addressed in the network. The nondeterministic polynomial problems can be solved in short time by using Heuristic algorithms. The research work proposed in this paper employs hybrid of Genetic algorithm with bacterial conjugation to obtain energy efficient clustering with dynamic network characteristics. The results of the proposed algorithm demonstrates that it outperforms the existing methods such as LEACH-M and EEC-PSO by 12.3% and 10.6% respectively in terms of average energy consumption and network lifetime.**

Keywords—Wireless Sensor networks, Cluster Head, Bacterial conjugation, Genetic Algorithm, Network lifetime, Energy.

I. INTRODUCTION

A wireless Sensor network (WSN) comprises of various sensor nodes that are able to sense the environmental parameters and transfer them to the sink node [1]. Wireless Sensor networks have achieved popularity all over the world due to it's applications in video surveillance systems, healthcare, traffic, environmental monitoring, disaster area monitoring and so on. A major issue in heterogeneous wireless sensor networks is the energy consumption due to sensing, processing in nodes, communication between the nodes and the sink node. Often there is no access to recharge or replace the batteries once their energy level becomes low [2]. A major challenge in this direction is three parameters such as population size, the rate of crossover and the mutation rate which can be implemented for many optimization problems. But finding the optimization parameter for each problem is a lengthier procedure which consumes more time and energy. Hence, the paper proposes genetic algorithm with bacterial conjugation where in bacterial conjugation means direct gene transfer between bacterial cells. The genetic material is transferred between bacterial cells further classified as horizontal gene transfer technique. The paper presented uses this operator to speed up the algorithm. Here the recipient cell inherits the donor attributes which is fittest and beneficial for it. Thus, an individual with best fitness is called the donor cell for other individuals present. The presented approach uses less computational resources resulting in reducing the complexity. The initial parameters need not be configured and this saves the time of initialization and it avoids false convergence which results in more accurate results [4].

The major objective of the presented work is to employ GA algorithm for selecting smart cluster heads (CH) and then BC is implemented for efficient CH selection in a more optimal manner.

The Fig. 1 shows the Wireless sensor network with several clusters formed. The clustering is the method of grouping the sensor network nodes into several clusters where each cluster consists of a Cluster head (CH) and member nodes [5]. The sensed data from cluster members is sent to the CH and the same will be transmitted to the base station through the sink node [17]. The two types of communication that exist are intra cluster and inter cluster communication. The CH near the base station tends to lose its energy faster due to large number of communications through it.

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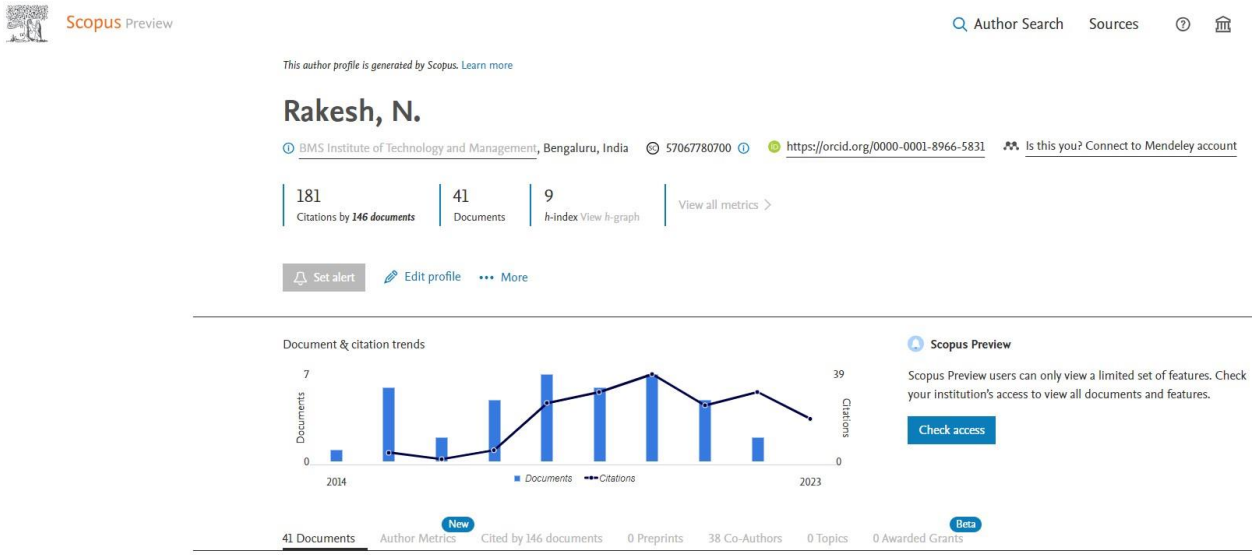

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Dr Prakash G L , Associate Professor , BMSIT&M
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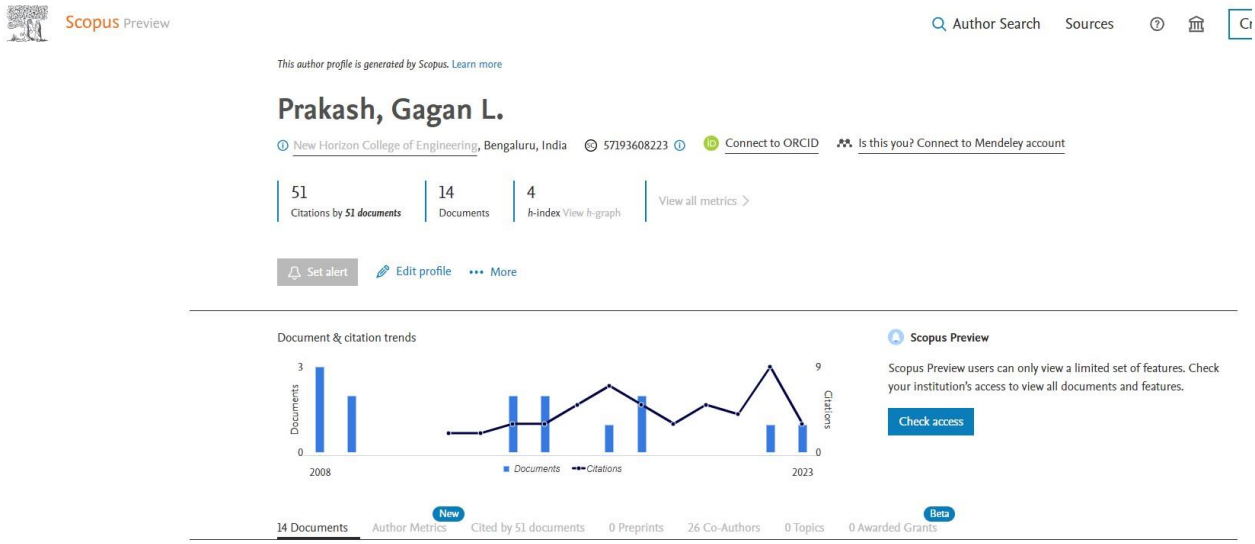

INTERNATIONAL CONFERENCE with Scopus Indexed

1.

Dr Prakash G L Published a paper title "A Design of Highly-Secured Map Chaotic Encryption Scheme for VANET Communication" 2023.

A Design of Highly-Secured Map Chaotic Encryption Scheme for VANET Communication

Christalin Nelson S[1,2][0000-0002-1562-6765], Ram Karan Singh[1], G.L.Prakash[3]

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Abstract. In the realm of wireless communication, Vehicular Ad Hoc Networks (VANETs) confront security vulnerabilities, necessitating the adoption of an encryption method that ensures efficient and secure communication. VANETs typically rely on the group key agreement model for security, but this approach proves ineffective due to resource overuse within the network. To establish secure communication in VANETs, this study proposes an innovative, lightweight, and robust protocol that utilizes Network-Centric Henon-Logistic-Chaotic Maps (NC-HLM) to ensure a high level of security among vehicles. The suggested methodology enables legitimate vehicular devices to periodically update their keys during each gearbox iteration and privately transmit the dynamically generated key authentication for secure data transmission from source to destination. Formal analysis using the Burrows-Abadi-Needham Logic (BAN) was conducted to assess and evaluate the security strength of the proposed model, and comprehensive validation was carried out using NIST (National Institute of Science and Technology). The results unequivocally demonstrate that the proposed system exhibits robust security characteristics against both active and passive attacks. Furthermore, this approach effectively addresses the limitations of current security techniques and significantly outperforms existing designs.

Keywords: VANET, Chaotic System, Henon Logistic Chaotic Maps, Group Key Agreement, Encryption, NIST, BAN.

1 Introduction

VANETs serve as advanced on-demand communication systems for efficiently managing road traffic flow in response to the rapid expansion of IoT and 5G communication technologies [1]. VANETs rely on key components such as the roadside unit (RSU), vehicles, and onboard units (OBUs) to establish connections that transmit critical vehicle information, including speed and ID, to ensure seamless traffic flow control. For this communication to be effective, it must be highly accurate and secure, as VANETs are susceptible to various security threats, similar to other communication channels.

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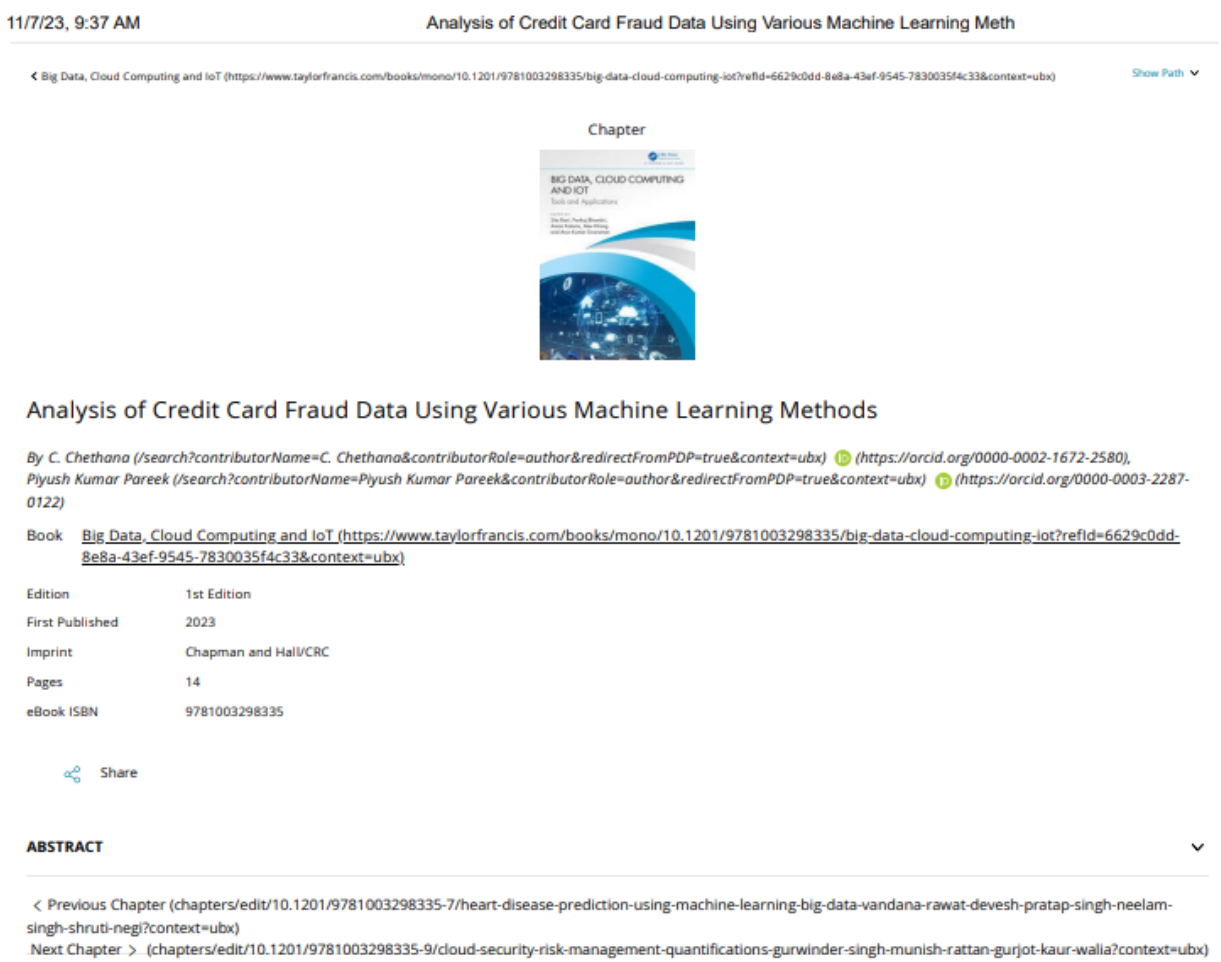
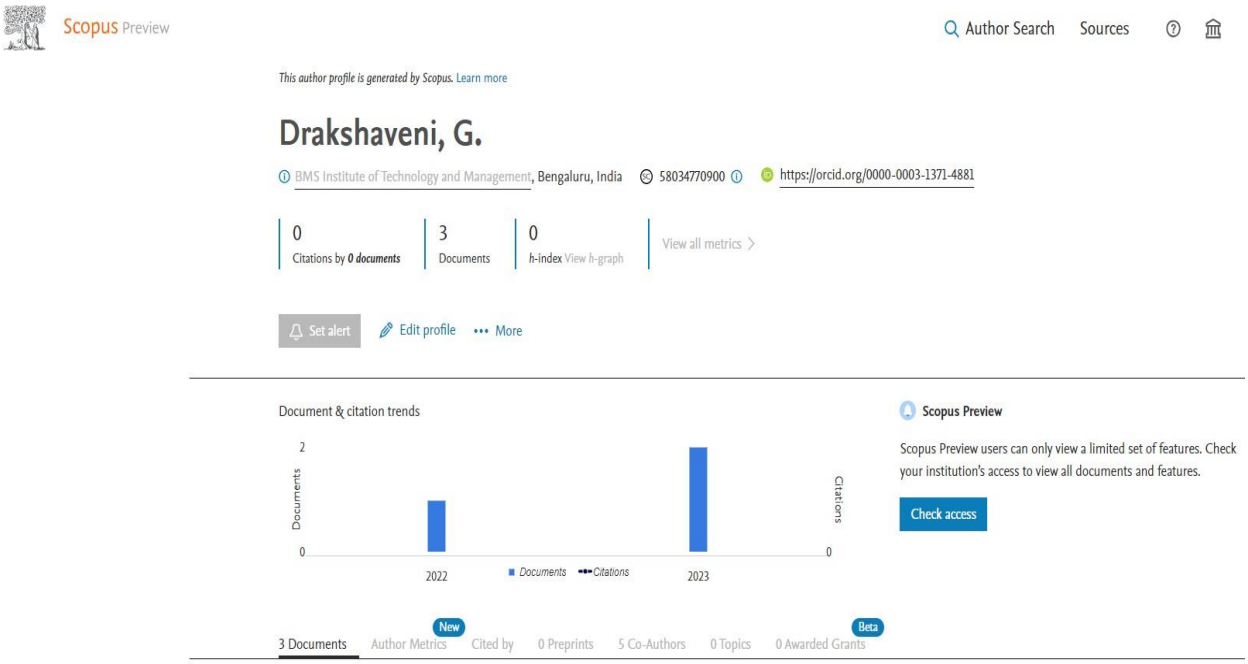
Book Chapter with Scopus Indexed

Chethana, C., Pareek, P.K. Published a Book Chapter title "Analysis of Credit Card Fraud Data Using Various Machine Learning Methods "Big Data, Cloud Computing and IoT: Tools and Applications, 2023, pp. 103–116



Dr Drakshaveni G, Assistant Professor , BMSIT&M

Scopus Id 57536633400



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1. **Dr Drakshaveni G and Hamsavath P.N.** Published a paper title "Comparative Analysis of Medical Imaging Techniques used for the Detection of Thyroid Gland with an Emphasis on Thermo gram" Electrical Engineering, volume 928, pp.691-700 (2023).

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Comparative Analysis of Medical Imaging Techniques Used for the Detection of Thyroid Gland with an Emphasis on Thermogram

G. Drakshaveni & Prasad Naik Hamsavath

Conference paper | First Online: 13 December 2022

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Part of the Lecture Notes in Electrical Engineering book series (LNEE,volume 928)

Abstract

In today's scenario, every human being in the world is scared of the COVID-19 pandemic, and everyone in the world want early medication for COVID-19. So in this paper, a study of numerous medical imaging techniques used for detection of thyroid gland in the human being in different stages of human life is presented. Early thyroid illness discovery is that the main necessary in growing the speed of diagnosing cure and survival of the affected creature. There are a various medical imaging techniques used to detect thyroid diseases in human being. Some techniques are used to diagnose stages of thyroid cancer in humans. This paper is used to explain the procedure for the diagnosis of images, investigation of images, pros, cons, and limitations of imaging techniques. A comparative study of various medical imaging techniques explains the Thermogram image is the noninvasive system that detects the relative temperature variations in patients form thyroid diseases. In this paper, survey of the various algorithm implemented is studied for thermography, MRI, ultrasound, and mammography from the literature review and it is observed that detection of thyroid abnormalities using different techniques not only decides many factors such as segmentation of the region of thyroid gland, image quality, and extraction features and classifiers.

Keywords

MRI **Thermogram** **Mammogram** **Ultrasound** **Thyroid gland**

Book Chapter with Scopus Indexed

1. **Dr Drakshaveni, K.R. Swetha, M.Sathya, Chilukuri Bala Venkata Subbarayudu and G. Pavithra** Published a paper title "A Smart Healthcare Cognitive Radio System for Future Wireless Commutation application with Test methodology" on June 10 2023.

DOI: 10.1007/978-3-031-23602-0_22

Home > Artificial Intelligence for Smart Healthcare > Chapter

A Smart Healthcare Cognitive Radio System for Future Wireless Commutation Applications with Test Methodology

K. R. Swetha, G. Drakshaveni, M. Sathya, Chilukuri Bala Venkata Subbarayudu & G. Pavithra

Chapter | First Online: 10 June 2023

500 Accesses

Part of the EAI/Springer Innovations in Communication and Computing book series (EAISICC)

Abstract

Cognitive radio technologies play a key role in communication. The intelligent machine systems with a cognitive radio mechanism can communicate accurately between primary and secondary users. There is no standard cognitive end-user research technique in the cognitive radio (CR) communication area that is very important in the 5G platform; scalability and reliability are one of the best natures across several CR architectures. Furthermore, the CR sector lacks a device-independent architecture that enables testing of the whole CR system rather than individual components, and this issue is very problematic in communication. This paper presents the Cognitive Radio Research Technique (CORATM), with machine intelligent CR (MICR) test methodology to resolve this limitation. MICR suggests behaviour-based node assessment to PU (primary user) and SU (secondary user) to assess cognition at the channel. Measuring the success of both the main user (MU) and secondary user (SU) (i.e., the CR under test) can be most useful. The results of behaviour-based MICR research work providing accuracy 98.34%, sensitivity 98.56%, recall 98.51%, F scores 98.65%, and throughput 99.32% were attained; those improved results are efficient compared to previous representations. This model competes with 4G models and works parallelly with 5G technologies. Also, the MICR model is proven to compete with future level communication applications.

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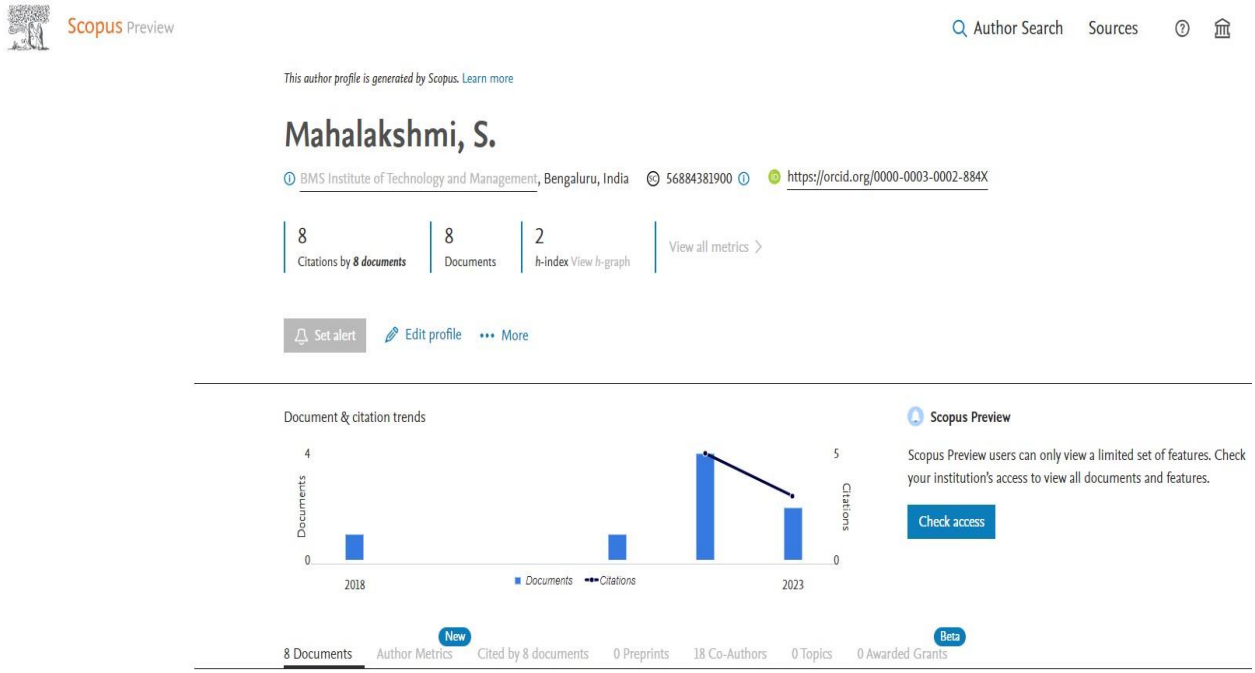

INTERNATIONAL CONFERENCE with Scopus Indexed

1.	**Veena N, Mahalakshmi S and Bhargava O**, Reviewer for the 7th International Conference on Methodologies and Communications (ICCMC-2023) on "Human Trap Detection Using Convolution Neural Networks" pp.411-415.
2.	**Manjunath T.N, Mahalakshmi S Yogish D and Yogish H.K** Published a paper title "Smart question answering System using Vectorization approach and statistical scoring method" Preceeding Volume 80, pp. 3719-3725(2023).

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INTERNATIONAL JOURNALS with Scopus Indexed

1.	**Shanthi D.L and Chethan N** Published a paper title "Genetic Algorithm based Hyper-Parameter Tuning to improve the Performance of Machine Learning Models" SN Computer Science, 2023 4(2), 119

Original Research | Published: 22 December 2022

Genetic Algorithm Based Hyper-Parameter Tuning to Improve the Performance of Machine Learning Models

D. L. Shanthi & N. Chethan

SN Computer Science 4, Article number: 119 (2023)

137 Accesses | 1 Citations | Metrics

Abstract

Parameter setting will have a great impact on overall behavior of a machine learning model in terms of training time, infrastructure resource requirements, model convergence, and model accuracy. While training machine learning models, it is very difficult to choose optimum values for various parameters to create the final model architecture. There are two types of parameters in machine learning model, one is referred as model parameters that are estimated by fitting the given data to the model. And the other is referred as model hyperparameters, these parameters are used to control the learning process. Model parameters are determined by machine ideally by exploration and automatically picks the optimum value; for example, the weights given to a neural network continuously update throughout each iteration until an optimal value is not reached. The method of hyperparameter tuning aims to determine the optimal combination of hyperparameters that will enable the model to function optimally. Setting the optimal mix of hyperparameters is the only method to maximize model performance. However, the designer is responsible for setting the hyperparameters that define the model architecture, such as the value of k in a kNN model, and the process of finding the optimum hyperparameter is referred to as hyperparameter

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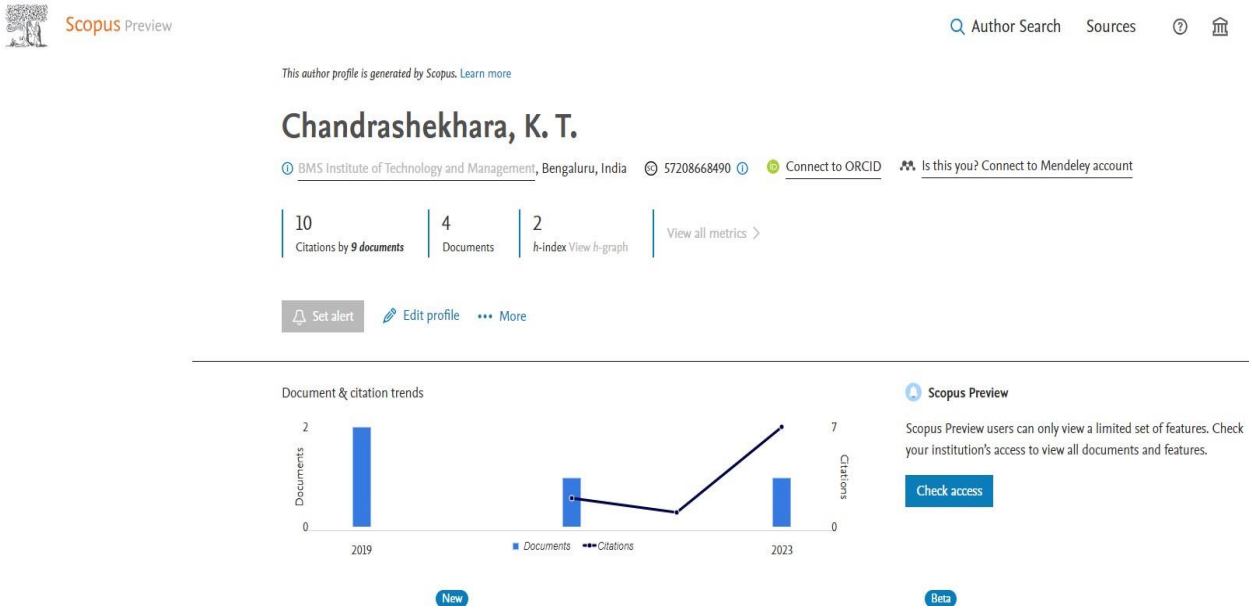

Book Chapter	
1.	**Chandrashekhara, K.T., Gireesh Babu, C.N., Thungamani, M.** Published a Book Chapter title " Recommendation Engine for Retail Domain Using Machine Learning Techniques " Data Engineering and Data Science: Concepts and Applications, 2023, pp. 303–315 **https://doi.org/10.1002/9781119841999.ch12**

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Chapter 12

Recommendation Engine for Retail Domain Using Machine Learning Techniques

K. T. Chandrashekhara, C. N. Gireesh Babu, M. Thungamani

Book Editor(s):Kukatlapalli Pradeep Kumar, Aynur Unal, Vinay Jha Pillai, Hari Murthy, M. Niranjanamurthy

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Summary

A recommendation system is highly beneficial to any business in the retail industry; not only does it increase revenue but it also enables retailers to provide their customers with the products they require. In this paper we are building a recommendation engine for a retailer that analyzes available products data to make predictions of which products will gain more revenue to retailer and which products are from which supplier. This can be done by performing clustering of the products based on the transaction history of the product purchases and then dividing the products into low-selling products, medium-selling products and high-selling products using canopy K-means clustering technique. RFM analysis is performed to classify customers and suppliers. Recency Frequency Monetary technique is a Marketing strategy used for analyzing customer behavior such as how recently a customer has purchased (recency), how repeatedly the customer purchased (frequency) and how much customer spends (monetary). It also classifies the suppliers into Low Gain, High Gain and Medium Gain which depends upon the product transactions of each of the suppliers. Which products will gain more revenue in the future and from which supplier is determined, and how many must be purchased on an average is predicted using ARIMA model.

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INTERNATIONAL CONFERENCE with Scopus Indexed

Dr Gireesh Babu C N Assistant Professor BMSIT&M
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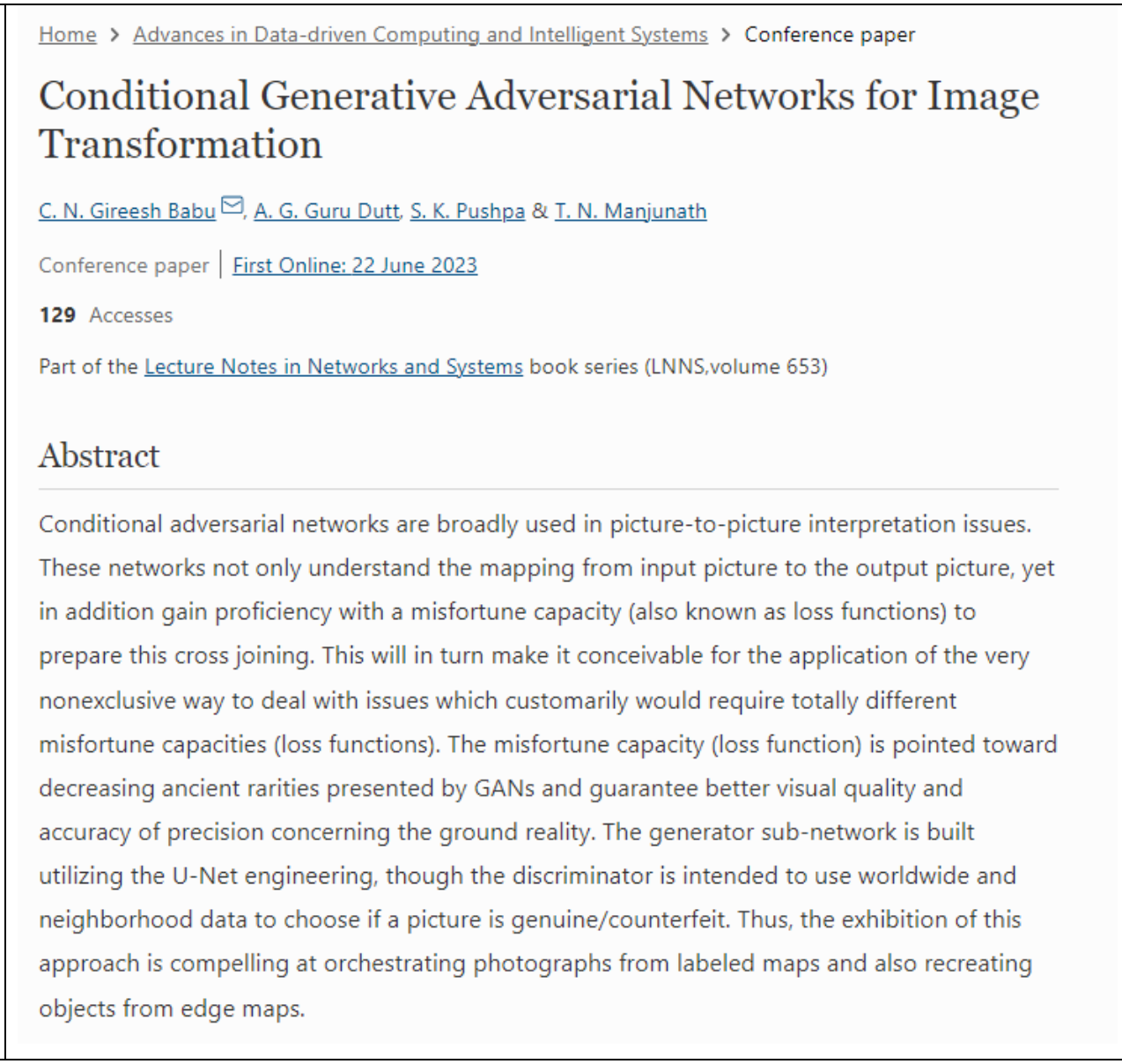
INTERNATIONAL CONFERENCE with Scopus Indexed

1.	**Gireesh Babu C.N, Guru Dutt A.G, Pushpa S.K and Manjunath T.N** Published a paper entitled "Conditional Generative Adversarial Networks for Image transformation". **2023.**



Home > Advances in Data-driven Computing and Intelligent Systems > Conference paper

Conditional Generative Adversarial Networks for Image Transformation

C. N. Gireesh Babu, A. G. Guru Dutt, S. K. Pushpa & T. N. Manjunath

Conference paper | First Online: 22 June 2023

129 Accesses

Part of the Lecture Notes in Networks and Systems book series (LNNS,volume 653)

Abstract

Conditional adversarial networks are broadly used in picture-to-picture interpretation issues. These networks not only understand the mapping from input picture to the output picture, yet in addition gain proficiency with a misfortune capacity (also known as loss functions) to prepare this cross joining. This will in turn make it conceivable for the application of the very nonexclusive way to deal with issues which customarily would require totally different misfortune capacities (loss functions). The misfortune capacity (loss function) is pointed toward decreasing ancient rarities presented by GANs and guarantee better visual quality and accuracy of precision concerning the ground reality. The generator sub-network is built utilizing the U-Net engineering, though the discriminator is intended to use worldwide and neighborhood data to choose if a picture is genuine/counterfeit. Thus, the exhibition of this approach is compelling at orchestrating photographs from labeled maps and also recreating objects from edge maps.

Book Chapter

1.	**Chandrashekhara, K.T., Gireesh Babu, C.N., Thungamani, M.** Published a Book Chapter title ” Recommendation Engine for Retail Domain Using Machine Learning Techniques ” Data Engineering and Data Science: Concepts and Applications, 2023, pp. 303–315

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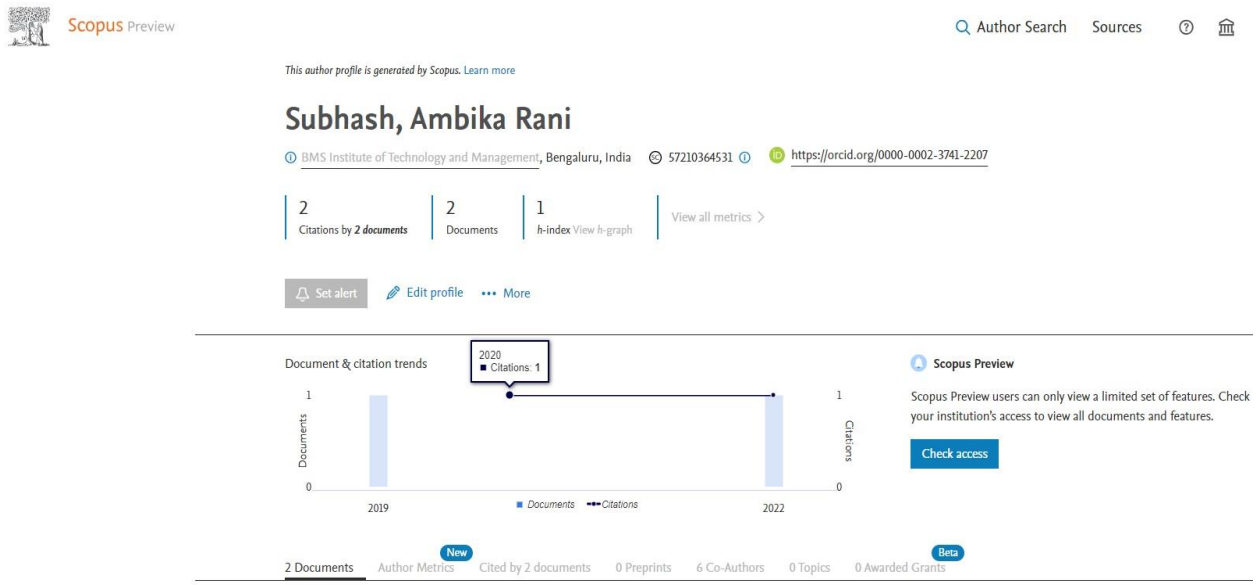

INTERNATIONAL CONFERENCE with Scopus Indexed

Dr Swetha M S , Assistant Professor , BMSIT&M

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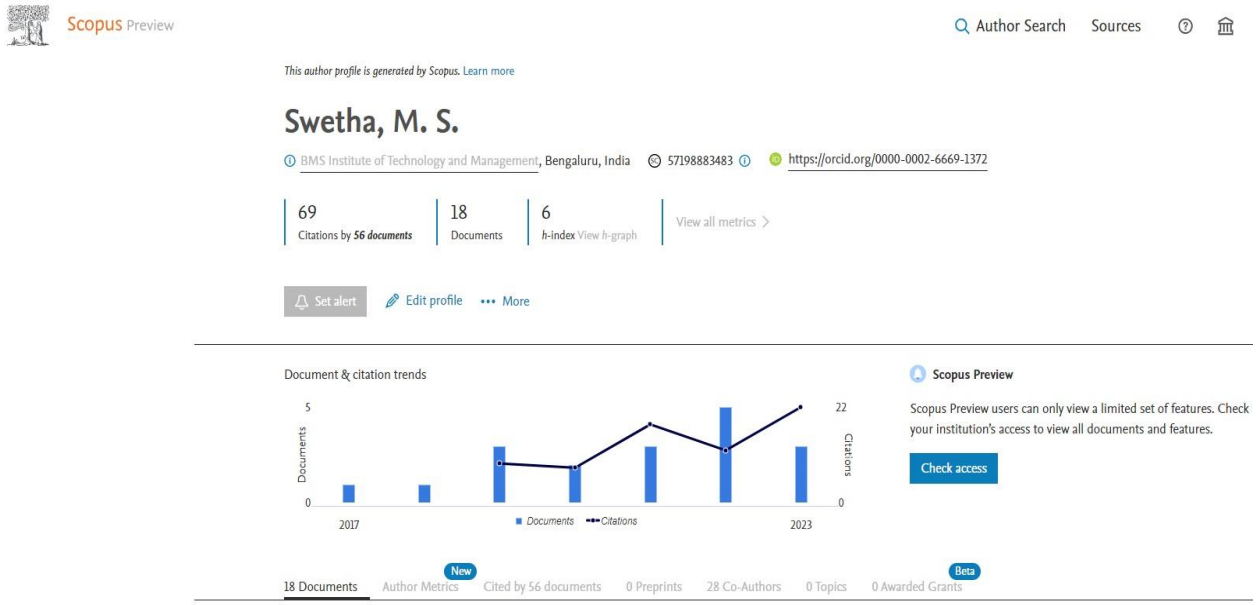

INTERNATIONAL JOURNAL with Scopus Indexed

1. **Swetha, M.S, Muneshwara, M.S., Murali Manohara Hegde, A.S, and Lu, Z.** Published a Book Chapter title "6G Wireless Communication Systems and Its Applications" in Computational Intelligence, 2023, 1068, pp.271-288.

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2023 | OriginalPaper | Chapter

6G Wireless Communication Systems and Its Applications

Authors : M. S. Swetha, M. S. Muneshwara, A. S. Murali Manohara Hegde, Zonghyu Lu

Published in: Machine Learning and Mechanics Based Soft Computing Applications

Publisher: Springer Nature Singapore

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Abstract

In the coming years, additional iterations of the 5th generation (5G) of wireless communication will be introduced. However, due to the inherent constraints of 5G and the development of new applications and services with demanding specifications like latency, energy/bit, traffic capacity, and peak data rate, telecom researchers are now concentrating on conceptualizing the following generation of wireless communications, known as sixth-generation wireless communications (6G). The Internet of Things (IoT) is anticipated to transform consumer applications and services, ushering in a future of fully intelligent and autonomous systems leveraging sixth-generation networks. A collaborative effort between industry and academia has started to conceptualize the sixth generation of wireless communication systems with the aim of laying the groundwork for stratification of communication needs in the 2030s in order to meet these demanding requirements and maintain wireless networks' competitive edge. This work also goes

Book Chapter with Scopus Indexed

2. **Muneshwara M.S, Swetha M.S, Anand R and Anil G.N.** Published a book chapter "Reduce the Privacy and Security Concerns of Current Social Media Platforms Using Blockchain Technology" on Network technology, 2023, pp.273-288.

< Research Advances in Network Technologies (https://www.taylorfrancis.com/books/mono/10.1201/9781003320333/research-advances-network-technologies?refId=a4bad012-9d50-41bb-b45e-ff08d0a990b1&context=ubx) Show Path

Chapter

Reduce the Privacy and Security Concerns of Current Social Media Platforms Using Blockchain Technology

By M. S. Muneshwara (/search?contributorName=M. S. Muneshwara&contributorRole=author&redirectFromPDP=true&context=ubx), M. S. Swetha (/search?contributorName=M. S. Swetha&contributorRole=author&redirectFromPDP=true&context=ubx), R. Anand (/search?contributorName=R. Anand&contributorRole=author&redirectFromPDP=true&context=ubx), G. N. Anil (/search?contributorName=G. N. Anil&contributorRole=author&redirectFromPDP=true&context=ubx)

Book Research Advances in Network Technologies (https://www.taylorfrancis.com/books/mono/10.1201/9781003320333/research-advances-network-technologies?refId=a4bad012-9d50-41bb-b45e-ff08d0a990b1&context=ubx)

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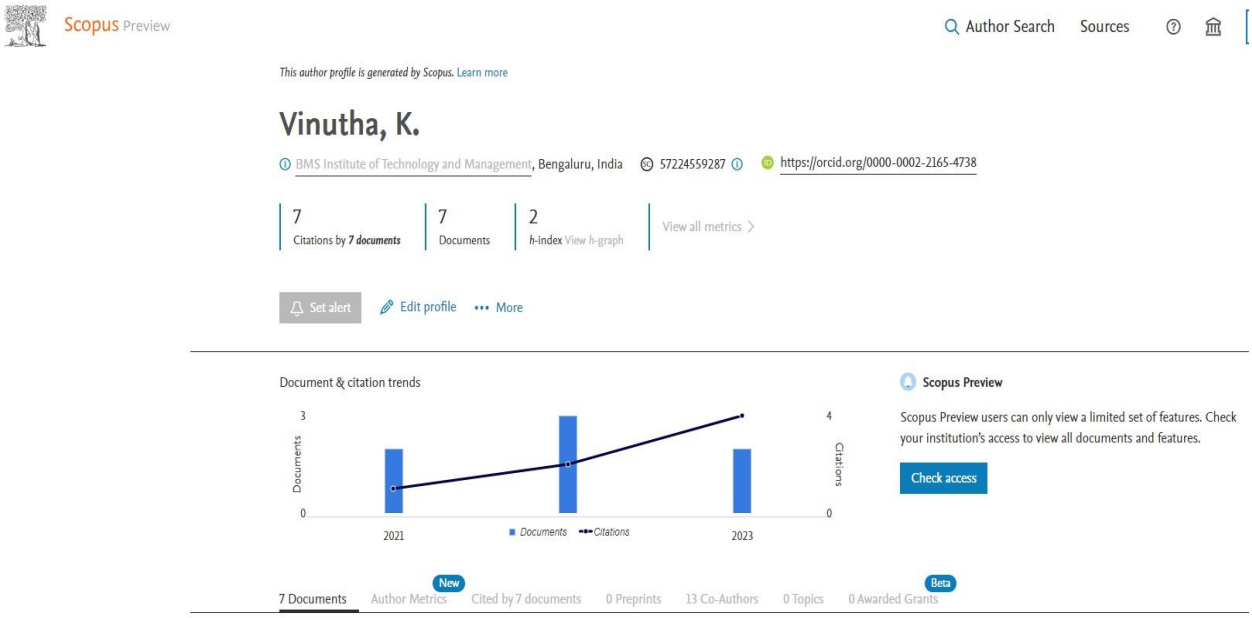

INTERNATIONAL JOURNAL with Scopus Indexed

1.	**Vinutha, K., Yogisha, H.K.** Published a paper title "Cluster based Approach of Student's Employment Prediction using PSO & EP" *International Journal of Intelligent Systems and Applications in Engineering*, 2023, 11(1), pp. 287–295

International Journal of
INTELLIGENT SYSTEMS AND APPLICATIONS IN ENGINEERING
ISSN:2147-6799 www.ijisae.org Original Research Paper

Cluster based Approach of Student's Employment Prediction using PSO & EP

Vinutha K[1], Dr. Yogisha H K[2]

Submitted: 30/10/2022 **Revised:** 19/12/2022 **Accepted:** 02/01/2023

Abstract: In the present era of globalization where the geographical boundaries are no bar in terms of job opportunities, there is need of understanding and analyzing the students profile in terms of probable job offers. This work presents the cluster based concept in developing the easy and handy approach to define the possible job category for the engineering undergraduate students. The limitation of K-means has been explored in terms of their initialization and can't consider in practice without re-verification. The optimal level of clustering has been developed using a hybrid approach of swarm intelligence and evolutionary computation. The dynamic approach of inertia weight in particle swarm optimization has been applied to provide the more suitable change with iteration while self-adaptive strategy in the evolutionary programming delivered the faster exploration. The proposed approach ensures the better balance between explorations vs. exploitation and delivered the optimal solution with high value of reliability.

Keywords: *Job category prediction, cluster, PSO, EP, Self-adaptive*

1. Introduction

Employment Programs for young people seeking job might be transformed by artificial intelligence (AI). Several instances of how AI may increase the availability, applicability, and effectiveness of youth programmes in developing nations are provided in a recent IFC report. According to research, the worldwide market for AI in learning and education is predicted to increase at a pace of 38% annually and reach $2 billion by 2023. The demand for more effective technological solutions for young employment, such as training, job matching, access to financing, etc., is projected to rise as a result of the decline in work options and mobility issues brought on by COVID-19. These cutting-edge technologies may reach more vulnerable populations as there is growth in rates mobile penetration to remote areas. The transition to competency-based profile and job matching systems can be aided by AI technologies. Instead of only gathering data on a job seeker's formal education and professional experience, a competence-based matching technique takes a more comprehensive approach by identifying talents, life experiences, and aspirations. AI may also assist in the analysis of skills assessment data to pinpoint a young person's ability gap and offer personalized recommendations for skill improvement and career advancement. AI is used by online education providers like Coursera and Andela to assess student test results and provide skill-building recommendations. Other companies, like the Brazilian company Revelo, aggregate information from work and school platforms online to provide upskilling recommendations on demand. Latent abilities and entrepreneurial potential in young people can also be discovered via the use of comprehensive psychometric evaluation. For instance, KnackApp measures 2,500'micro-behaviors', such as active and passive decisions, responses, or exploration, using a game based on neurological and behaviour research. Then, it pairs young people with suitable skill-development programmes in a variety of industries, including sales, retail, construction, hospitality services, and data science. Identifying the particular job abilities that will be required in the future is challenging. Traditional demand assessment techniques like surveys, focus groups, and industry consultations take time and are not always in-depth. It can often take up to 10 years for labor market systems to adapt to new trends and information, which causes nations to lag. Utilizing unstructured data from a variety of sources, including job listings, social media, and official websites, AI programmes may quickly forecast the demand for positions in the near future. For instance, Singapore's government-sponsored job-matching portal MyCareersFuture uses AI to evaluate real-time online labor market data from a

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INTERNATIONAL CONFERENCES with Scopus Indexed

2. **Vinutha K, Niranjan M.K, Makhijani J, Nirmala V and Vijaya Lakshmi T.R.** Published a paper title "A Machine Learning based Facial Expression and Emotion Recognition for Human Computer Interaction through Fuzzy Logic System" Proceedings- 6th International Conference on Inventive Computation Technologies, ICICT 2023, pp. 166–173

A Machine Learning based Facial Expression and Emotion Recognition for Human Computer Interaction through Fuzzy Logic System

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2023 International Conference on Inventive Computation Technologies (ICICT) | 979-8-3503-9849-6/23/$31.00 ©2023 IEEE | DOI: 10.1109/ICICT57646.2023.10134493

Abstract – Facial recognition is in use for the past decade there are many applications that needs facial expression to learn the human behaviour and emotions for certain activities. Facial recognition is in a development phase where many service providers use this feature to find the expression of the people on using their BlogSpot or website or reading any news article. This recognition of facial expression is highly possible with the help of machine learning technology. This research study has developed a facial expression recognizing algorithm using Python programming language with the help of Keras software package. This algorithm is purely based on machine learning approach that enables the programmer to process the facial image and convert it into data that is helpful in prediction of facial expression using the fuzzy logic technique. The fuzzy logic technique is a prediction method that helps programmer to predict the intermediate data by providing the initial and ending conditions. For enabling the facial recognition to process any system or a mobile device the algorithm needs permission to access the camera, once the onto the access is permitted the algorithm retrieves the image from the Vision sensor and with the help of image processing technology of the machine learning algorithm the program the program converts the data from the vision sensor into required facial expression and emotional content.

Key words – Facial expression, Emotion recognition, Machine learning, Vision sensor

I. INTRODUCTION

Learning has been part of human species for more than several decades learning is the process that keeps on human being to move forward and gain several knowledge in the process of evolving. In the modern world in the modern world due to the development in the field of information technology many researchers are involved in developing programs that helps machine and computer systems to learn from its surroundings and make decisions by itself with the help of artificial intelligence [1]. Machine learning it's a set of algorithms or program that helps computer systems and smart machines to learn from the activities using various sensors and decide for different problems.

In machine learning a model for a specific operation is developed and the model is trained with the necessary program to retrieve data from its sensors and to make decision on its own based on artificial intelligent technologies this technology is enables the smart equipment to recognize data from the outdoor environment. The image processing technology is the major field of machine learning which helps the machine learning process to recognize and process images and retrieve data from it [2].

There are several programming languages that are useful in developing machine learning algorithms few algorithms that help in development of machine learning

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INTERNATIONAL JOURNAL with Scopus Indexed

1.	**Nagarajappa R.K.B, Suresh, Y and Ravi Kumar B.N** Published a paper title "Software Development Effort Estimation Using Relational Database and Optimized Learning Mechanism" Journal of Computer Science, 2023, 19(4), pp. 540–553 DOI: https://doi.org/10.3844/jcssp.2023.540.553

Journal of Computer Science

Original Research Paper

Software Development Effort Estimation Using Relational Database and Optimized Learning Mechanism

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Abstract: Accurately estimating the cost of software development is crucial for effective project planning and resource allocation. However, traditional cost estimation methods rely heavily on expert judgment and historical data, which can be time consuming and prone to errors. This study suggests a learning-based cost estimation model that leverages relational databases to improve accuracy. The proposed approach estimates project cost based on the effort required to complete software development, which is a key driver of the project cost. The proposed model is designed to address the challenges posed by the variability in open-source development, including variable team sizes, working hours, and expertise. The study collects and pre-processes data from open-source platforms and selects cost drivers and metrics based on logical rules and SQL queries. Moreover, we propose an optimized Artificial Neural Network (ANN) with augmented topology to automate the selection of neuron units, layers, and adjustment of learnable parameters according to the input variables. The proposed model is evaluated on a 100 open-source software repositories dataset and demonstrates its effectiveness in accurately estimating development cost. The system is implemented using Python and evaluated using performance parameters such as MSE, RMSE, MAE, and MMRE. Results indicate that our proposed model offers a more accurate and efficient approach to software cost estimation, especially for freelancers and outsourcing firms. The proposed model has the potential to save time and resources and improve the reliability and accuracy of software cost estimation.

Keywords: Software Project Development, Cost Estimation, Effort Estimation, Relational Database, Artificial Intelligence, Machine Learning

Introduction

Unlike any product development, the Software Development Process (SDP) also includes various activities to be performed in a defined sequence. These activities and the sequence depend on whether it is a software product or a project (Berntsson-Svensson and Aurum, 2006). Typically, in the software project process, in the early stage, a User Requirement Specification (URS) is an essential activity to understand the client's expectations (McGraw and Harbison, 2020). Further, the stages include activities like software or System Requirement Specification (SRS) and Technical Requirement Specification (TRS). Based on three requirement specifications, including URS, SRS, and TRS, the architect designs the software, and based on design, the development, coding, and debugging take place. In an organization, the overall effort varies depending on the project to project. However, there has been a continuous evolution into SDP from a simple waterfall method to scrum and agile (Bilgaiyan *et al*., 2017) to handle the uncertain dynamics of the context and reduce the effort to build software either as a project or product. Moreover, the effective Cost Estimation Model (CEM) or Effort Estimation Model (EEM) for software development provides an effective tool to manage the project or product development process seamlessly and cost effectively. The experiences gained during the past project and their data correlated with the various software development activities may provide heuristic information for estimating the efforts. However, there exists a lack of accessibility or availability of such past project information (Usman *et al*., 2014). Thus, the algorithmic-based traditional effort estimation models lack the

Science Publications

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INTERNATIONAL CONFERENCE with Scopus Indexed

2.	**Ravi Kumar B.N and Suresh, Y**. Published a paper titled "Software Effort Estimation using ANN (Back Propagation)"

Software Effort Estimation using ANN (Back Propagation)

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***Abstract*- Project managers often use Effort Estimating strategies to manage the human resources of current or upcoming software projects. Prior to project implementation, cost, time, and personnel estimation are basically necessary. For every project of software, getting an accuracy in Effort Estimation has always been difficult. In case of this study, estimating the labor involved in developing software determined using a Back Propagation Model. This model's goal is to investigate the capabilities and potential uses of utilizing Artificial Neural Networks (ANN) as a tool for forecasting the effort required for software development. In order to estimate the software work, we are attempting to implement a machine learning technique in this research. Out of all machine learning methods, we are applying an algorithm based on Artificial Neural Networks that is Back propagation. The Desharnais dataset, a well-known publicly available dataset for estimation of software effort, is used to test the approach. The performance and accuracy of the tested model have been evaluated using three metrics: MMRE, MRE, and Pred (0.25). In the sections below that follows, I explain the algorithm and its results.**

Keywords - Artificial Neural Network, Software Effort Estimation, Machine Learning, Back propagation.

I. INTRODUCTION

The action of estimating a time necessary to create software is called effort estimation. Estimating the work is a critical job in the software industry. To produce accurate estimates, many computational models have been developed. Initial estimates without a clear understanding of the needs are inaccurate, but as the project advances, estimate accuracy increases. Choosing the right estimating technique is crucial as a result. Estimates of the effort can be utilized as input in budgets, investment plans, iteration plans, and project plans evaluations, pricing methods, and bidding rounds. Since at least the 1960s, the problem of assessment software development effort has been addressed by experts in the field, including researchers and practitioners of software. project. The biggest difficulty in project scheduling in the software industry is deciding how much of the project's resources should go toward the testing phase. It has been discovered that the testing phase often uses between 40% and 50% of the resources. Estimating the specific amount of work that has to be put into the testing phase is quite difficult, though. Estimating the specific amount of work that has to be put into the testing phase is quite difficult, though. As a result, the project planning is flawed. Inadequate testing of a project could cause the company to suffer severe losses. The study's primary focus has been on creating formal models for estimating software effort.

Software labor intensity estimation has been studied using various methodologies such as Expert estimation, Fuzzy models, COCOMO [12] and advanced machine learning technologies such as Random Forest, neural networks [1], bagging predictors [9], and support vector regression (SVR). When predicting the effort of a future effort, machine learning algorithms analyses the previous recorded data and develop a model. Most methods for estimating software effort provide an estimate of effort [1][4][7][9][10]. However, it would be crucial to give estimation accuracy measures in addition to the estimation [10]. This would make it possible for an estimation technique to provide an accuracy range for where the effort would fall.Fig.1 shows Outcome of Poor Project Management.

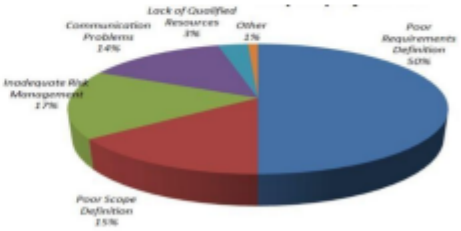

Figure 1. Outcome of Poor Project Management

II. LITERATURE SURVEY

A review of several recent studies on software project effort estimation is provided in this section. Numerous publications have lately been published in this area of current study. This study reviews a few significant

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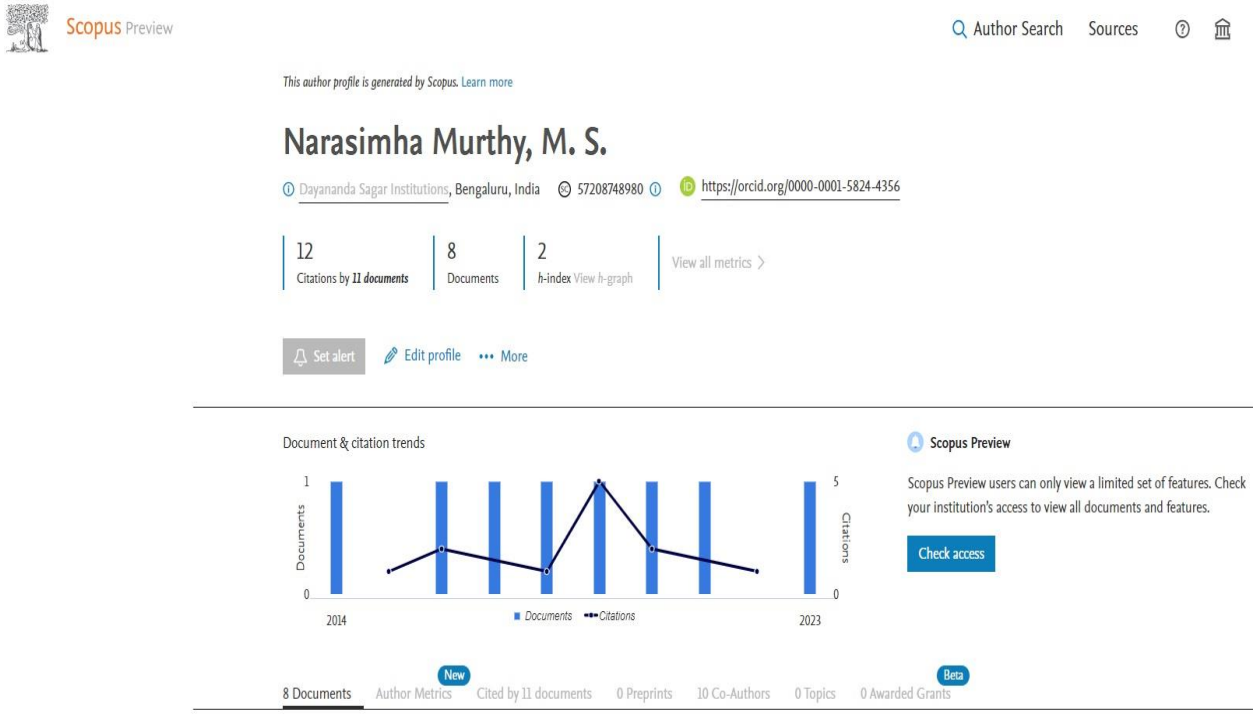

INTERNATIONAL JOURNAL with Scopus Indexed

1.	**Supritha N and Dr. Narasimha Murthy M S** Published a paper title " A Comparative Study of the CNN Based Models Used for Remote Sensing Image Classification" International Journal of Electrical and Electronics Research (IJEER) , Volume 11, Issue 3, 10 July 2023. DOI: https://doi.org/10.37391/ijeer.110301

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A Comparative Study of the CNN Based Models Used for Remote Sensing Image Classification

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ABSTRACT- Remotely sensed images, their classification and accuracy play a vital role in measuring a country's scientific growth and technological development. Remote Sensing (RS) can be interpreted as a way of assessing the characteristics of a surface or an entity from a distance. This task of identifying and classifying datasets of RS images can be done using Convolutional Neural Network (CNN). For classifying images of large-scale areas, the traditional CNN approach produces coarse maps. For addressing this issue, Object based CNN method can be used. Classifying images with high spatial resolution can be done effectively using Object based image analysis. Deep learning methods offer the strength of auto learning the spatial features of an image. Object scale based adaptive CNN is a novel technique that can improve the accuracy of image classification of high spatial resolution images. For efficient RS image classification, a novel Deep learning approach called distributed CNN can be used which leads to enhanced accuracy of RS image classification. In this paper, three CNN models have been compared while considering the training time and efficiency to classify RS images as parameters of measure to assess the CNN models.

General Terms: Remote Sensing, Deep learning, segmentation, image classification
Keywords: Object scale-based CNN, Object-based image analysis, Multiscale CNN, Distributed CNN.

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resolution images can be classified using Object based image analysis (OBIA) since they use segments of the images first and then classifies them. The segments are identified as object primitives and scaling is performed. However, due to the variety and complexity present in the remotely sensed dataset images, the idea of object scaling used in OBIA leads to over and under segmentation at the same time. Deep learning algorithms like multiscale CNNs make use of patch-based schemes [19] and pixel-to-pixel scaling for precise classification of RS images.

OCNN Land cover mapping RS images

2. **Vidya H A, and Dr. Narasimha Murthy M S** Published a paper title "Artificial Intelligence in Agriculture and Healthcare: A Comprehensive Study." European Chemical Bulletin,2023, DOI: 10.48047/ecb/2023.12.8.628

Artificial Intelligence in Agriculture and Healthcare: A Comprehensive Study

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ABSTRACT: Agriculture and health are two interrelated fields, as they are linked to human welfare, which is of utmost importance in today's world. They form the backbone of human life and the country's economic system. Agriculture is of vital importance in maintaining good health. Conversely, health also affects agriculture, as it requires good agricultural products. Nowadays, health is affected by the consumption of adulterated food. There is an urgent need to improve the quality of the agricultural products we use in order to maintain good health. Good health creates healthy people and communities, which in turn contributes to environmental and economic balance in the world.

Thinking bigger, we need to use technology to improve agriculture and healthcare to monitor various problems in both sectors. Nowadays, artificial intelligence (AI) plays an important role in almost all sectors. Machine Learning (ML) and Deep Learning (DL), which are part of artificial intelligence, are gaining more and more importance and benefits in various fields. In this paper, we see how Artificial Intelligence, Machine Learning and Deep Learning are making their impact especially in the field of agriculture and healthcare. The paper includes the main Artificial Intelligence algorithms and tools that are useful in these two sectors.

Keywords: Artificial Intelligence, Machine Learning, Deep Learning, Healthcare, Agriculture, tools.
DOI: 10.48047/ecb/2023.12.8.628

1. INTRODUCTION

Farmers have taken the responsibility of feeding people all over the world. The majority of people in India depend on agriculture, which is also their livelihood. About 70% of the people in India depend on agriculture for their livelihood. Agriculture is one of the main sources of income for the country. Agriculture also serves as a source of raw materials for many industries. It is also the source of foreign exchange. Agriculture provides food security by preventing malnutrition. Therefore, agriculture must be given high priority and research must be done in this field to help farmers in various aspects of agriculture [15].

The survival of humans and animals on our planet depends on plants. Without plants, life on this world is not possible. Plants provide food for many organisms, create habitats for many organisms, help in maintaining biodiversity, global warming, etc. Many natural components come from plants and help us unlock many biological mysteries.

Plants also serve psychological purposes. Many plants also serve as natural medicines for many diseases that have no side effects. Plants are the source of energy for all living organisms on earth. Therefore, it is very important to cultivate plants and give high priority to agriculture. In almost all countries, about 10% of the annual budget is spent on agriculture [7].

We all know a famous saying that "health is wealth". Health plays a crucial role in a person's happiness. The two dimensions in which health is defined are longevity and quality of life. Health is also important because it affects labor productivity. Health care is an important factor that determines health. Health can deteriorate due to factors such as sudden illnesses, accidents, aging, and many others, so every individual needs health care services at one time or another in their lives [8]. Health care services are also needed to restore current health status and to recover from illness or injury [23]. Healthcare is a form of primary care for individuals and helps them to diagnose diseases and prevent them by arranging treatments [5].

India's healthcare expenditure is approximately 2.1% of GDP in 2021 [32]. This is mainly due to the Covid 19 pandemic. Therefore, healthcare is one of the most important areas to work on.

The structure of the paper is divided into different sections. Section 2 describes AI, ML and DL technologies. Section 3 describes the importance of ML and DL in agriculture and healthcare. Section 4 summarizes related work. Section 5 lists various tools and techniques used in different applications of AI, ML, and DL in agriculture and healthcare. Section 6

INTERNATIONAL CONFERENCE with Scopus Indexed

1. **Dr. Narasimha Murthy M S** Published a paper title "Deep Learning and MRI Improve Carotid Arterial Tree Reconstruction" July 2023, Conference: 2023 International Conference on Data Science and Network Security (ICDSNS)
DOI:10.1109/ICDSNS58469.2023.10245397

2023 International Conference on Data Science and Network Security (ICDSNS)

Deep Learning and MRI Improve Carotid Arterial Tree Reconstruction

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***Abstract*—This study suggests using magnetic resonance imaging (MRI) scan data to segment and rebuild the carotid artery tree using a deep learning-based method. In the proposed method, the UNET architecture is used to divide an image into parts, and then a 3D level set method is used to make the parts even better. The method was compared to seven different approaches to segmentation and reconstruction, and it outperformed all but one of them. It had a 94% accuracy rate and took 12 hours to process. Deep learning's capacity to reliably segment and categorise pictures, the UNET architecture's ability to maintain spatial information through skip connections, and the level set approach's ability to improve segmentation further all contribute to the proposed method's effectiveness. The proposed approach has the potential to be a useful tool for clinicians in evaluating the status of the carotid artery and finding any irregularities. Stroke is one of the most devastating symptoms of cardiovascular disease, and recognising and treating carotid artery stenosis in its early stages can help avoid or reduce the risk of having a stroke. The success of the proposed method shows that deep learning techniques have the potential to improve the accuracy of carotid arterial tree reconstruction from MRI data. Better identification and treatment of carotid artery stenosis may increase the overall effectiveness of the proposed technique, ultimately leading to better patient outcomes.**

***Keywords*—Carotid Arteries, Magnetic Resonance Imaging, Deep Learning, Image Segmentation, UNET, Convolutional Neural Network.**

I. Introduction

Magnetic resonance imaging is a type of medical imaging that uses a magnetic field and radio waves to make accurate pictures of body parts inside the body. One of the goals of this imaging approach is to image the carotid arterial tree, which is the major blood supply to the brain and may be done with MRI. The carotid vascular tree is made up of three branches: the common carotid artery, the internal carotid artery, and the external carotid artery. The biggest of the three branches is the common carotid artery. These three arteries diverge in separate ways to provide blood to distinct parts of the brain. Imaging of the carotid artery's arterial tree is required for the diagnosis and monitoring of a variety of diseases, including atherosclerosis and stroke. Radiologists have traditionally relied on manual reconstruction of the carotid arterial tree in their practise. This is the conventional method, which requires a lot of hard labour and takes a long time. Recent advances in deep learning techniques, on the other hand, have enabled this process to be automated, resulting in an improvement in both speed and accuracy. Deep learning is a machine learning subject that refers to the process of teaching data patterns to neural networks with several layers of training [1-2]. Its training is carried out by feeding data to neural networks. The weights of the connections created between the neurons in the network must be adjusted in order for the neural network to learn to recognise patterns in data. Deep learning has been successfully utilised in a wide range of applications, including image identification, natural language processing, and speech recognition.

In this work, we will look into how deep learning methods have been used to improve the process of reconstructing the carotid artery tree from MRI images [3]. We will specifically examine how these techniques have been implemented. Many alternative strategies were used to increase the precision of the reconstruction. In this part, we will discuss the difficulties associated with reconstructing the carotid arterial tree as well as how deep learning might be able to help us overcome these difficulties. A literature review will also be undertaken on the various deep learning-based techniques for the reconstruction of the carotid arterial tree that are currently available. The rebuilding of the carotid arterial tree is fraught with difficulties, including the following:

Using MRI data to recreate the carotid artery tree is a hard and time-consuming job because there are so many things to consider. To begin, MRI images are often noisy and include artefacts, making it difficult to distinguish the numerous components that form the carotid artery tree. Furthermore, because MRIs have a very narrow field of view, it might be difficult to discern microscopic features within the picture. Second, because the carotid arterial tree is a complicated structure that varies widely across individuals, developing a solution that is relevant to everyone and performs in the same way is challenging. Last but not least, the process for rebuilding the carotid artery tree is tedious and time-consuming, increasing the likelihood of errors and inconsistencies [4]. Deep learning algorithms, which were successful in their application, were used to reconstruct the carotid artery tree using MRI data. These approaches necessitate the training of neural networks on massive datasets of MRI images as well as the labelling of the carotid arterial tree based on the associated ground truth. Because it has been trained to recognise patterns in data, the neural network can properly reconstruct the carotid arterial tree using images from

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INTERNATIONAL CONFERENCE with Scopus Indexed

1.	**Sreenivasa N, Mohan B.A, Fernandies, R, Satish, E.G and Ahmed A** Published a paper title "The AgroCart Android Application to Manage Agriculture System" Lecture Notes in Electrical Engineering, 2023, 928, pp. 701–718 DOI:10.1007/978-981-19-5482-5_61

Emerging Research in Computing, Information, Communication and Applications pp 701–718

The AgroCart Android Application to Manage Agriculture System

N. Sreenivasa, B. A. Mohan, Roshan Fernandies, H. Sarojadevi, E. G. Satish & Abrar Ahmed

Conference paper | First Online: 13 December 2022

352 Accesses

Part of the Lecture Notes in Electrical Engineering book series (LNEE,volume 928)

Abstract

This system provides its users to get online information about the market requirements and guide farmers to grow the crops according to the market's need. This application has 4 modules, first is the Pre-Production module, where this application guides users to grow the crop according to market requirements. Second is the buying and selling module, where customers can register for the application by entering profile details. The customers can purchase products that are uploaded by the admin, and in the selling part, farmers are the sellers where they can sell their products online. The third is the blogs module, which helps farmers to use fertilizers to get a better yield of crops. And the fourth module is smart agriculture; it consists of a temperature sensor, moisture sensors, and pest detection.

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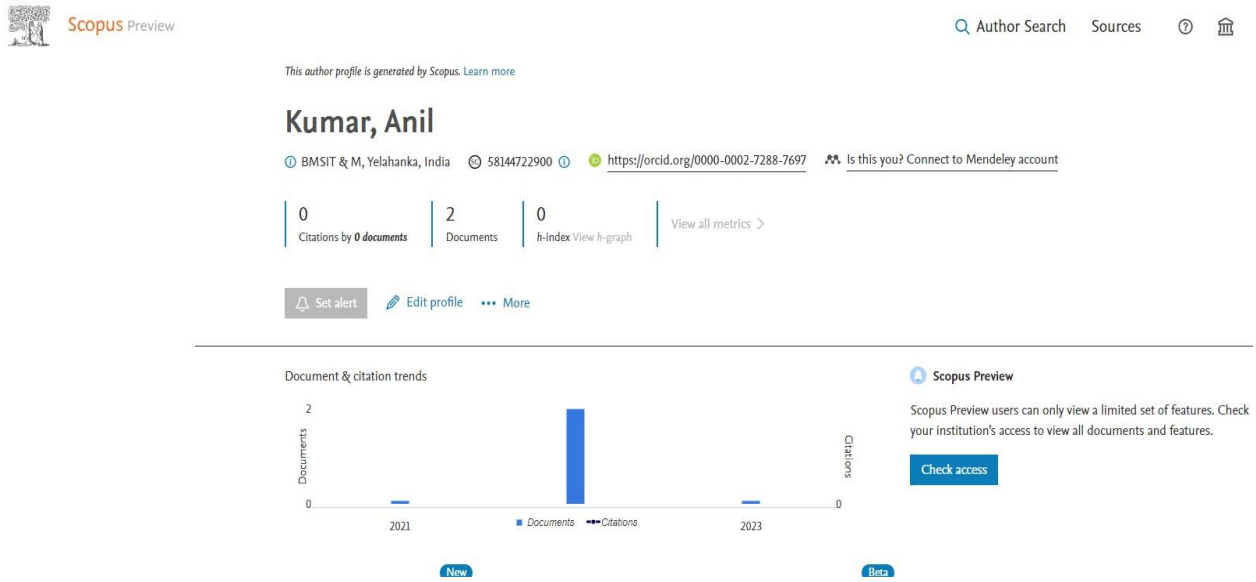

INTERNATIONAL CONFERENCE with Scopus Indexed

1.	**Anil Kumar, Mohan, B.A., Geeta Patil and Surekha K B** Published a paper title "Machine Learning based framework to predict the Network Usage in Smart Parking Applications" 4th International Conference on circuits, controls, communication and Computing(I4C-2022), 21-23 December 2022. DOI: 10.1109/I4C57141.2022.10057657

Machine Learning based framework to predict the Network Usage in Smart Parking Applications

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Abstract*— The automotive industry is growing daily, as many people prefer personal vehicles for many reasons. Due to the increased usage of private cars, especially in growing cities, parking space availability has become short and poses a big challenge. It also leads to further cascaded issues like traffic congestion, wasting time in finding free space, polluting the environment, and especially unnecessary wastage of fuel. Therefore inventing a smart parking system has become the need of the hour. Many researchers have attempted to design solutions to this issue by utilizing state-of-the-art technology in prominent areas like Wireless Sensor Networks, Cloud Computing, and Internet of Things. However, there is still scope for improvement in smart parking system performance. In this research work, we are simulating a smart parking system to get the parameters like network usage, transmission time, number of areas, and number of cameras used. The simulator works better for a small number of areas, but for larger-scale simulations, it takes more time. Hence, we propose a framework that can predict/analyze the performance of smart parking systems at an enormous scale using an ML algorithm. The experimental results show that predicting network usage of large-scale smart parking systems using an ML framework is 1500x faster than the simulation time of the CloudSim simulator.

Keywords*— Cloud computing, CloudSim, Network usage, Machine Learning, Regression, Decision Tree

I. Introduction

Advancement in Information Technology has made people move towards urban places, searching the good career growth. The consequences of this are cities getting overpopulated. Due to this migration of people towards cities, specifically industry centered, the number of vehicles used for commuting from workplace to residential places, logistic vehicles, etc., will be increased considerably to greater extent [1]-[4].Therefore, even though parking spaces are available, they are get shrunk. In this situation, it becomes a challenging task to search for a free parking place for the drivers, leading to wasting time searching for a parking place during peak hours. If more vehicles search for a parking place, this cascading effect will be traffic congestion. This leads to an unpleasant experience for the people with spending lot of time in searching the parking. Along with that, unnecessary fuel consumption will happen, which further leads to environmental pollution. According to [5] finding, car parking in American City Los Angeles costs around 730 tons of CO_2, 95000 Hours, and 47000 gallons of gasoline. As the population in the country is increasing, like India, it is a big concern. Many researchers have tried to address this issue by proposing smart car parking systems using other enabling technologies, but still, there is a scope for a better solution.

Due to increased areas and the number of cameras to implement smart parking network usage, simulation time will be exponentially increased. To overcome this issue, we are proposing a machine-learning framework to predict the network usage for large-scale parking systems.

The findings and contributions of the paper are as follows:

- A detailed study of the CloudSim simulator was done.
- It was observed that the simulation time increases as the total number of areas increases.
- Total Network Usage is the critical element in estimating the overall performance of the smart parking environment.
- A Machine Learning framework was built to predict the Network Usage for large-scale parking systems.
- Proposed Machine Learning was able to predict the results with a minimum speedup of 1500X when compared to the most widely used CloudSim simulator.

This paper is structured as follows: A formal introduction to smart parking is discussed in Section 1. The existing work done is discussed in Section 2, and Section 3 Specifies the overall Methodology. Section 4 discusses experimental Results and is followed by Conclusion.

II. Literature Survey

This section discusses the research on smart car parking systems, CloudSim, and machine learning algorithms. Vehicle drivers commonly try to find a parking place in congested cities by driving around the parking area, on streets, and on the roadside. As technology and smart devices like surveil- lance cameras and smartphones also come to the forefront in these areas, an ample number of automated techniques are helping drivers find parking slots. [6]-[10], have proposed a smart car parking system based on the cloud for smart cities. The solution consists of 3 tiers i.e., Application Layer, Communication Layer, and Sensor Layer. The topmost layer provides the services like locator service and parking control service, which is connected to the information center through an integrated service portal provided by the smart city administration. The communication layer will bridge the application layer to the

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INTERNATIONAL CONFERENCE with Scopus Indexed

1.	**Savitha S** Published a paper title "Optimizing Task Distribution Systems: A Comparative Study of Micro-Task Job Replication, Accuracy, and Budget Constraints " 2023 International Conference on Network, Multimedia and Information Technology (NMITCON) DOI: 10.1109/NMITCON58196.2023.10276252

Optimizing Task Distribution Systems: A Comparative Study of Micro-Task Job Replication, Accuracy, and Budget Constraints

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***Abstract*—Crowd-sourcing harnesses the collective strength of a large and geographically diverse pool of individuals to tackle complex industrial tasks that surpass the capabilities of machine intelligence alone. This distributed approach is facilitated through crowd-sourcing platforms like Amazon Mechanical Turk (MTurk), CrowdFlower, Tasken, and TopCoder. By leveraging the potential of crowd participation, these platforms enable the completion of tasks with significant monetary rewards, effectively reducing overall production costs for industries. In our work, we present a standardized model for industrial crowd-sourcing, where complex tasks are decomposed into manageable micro-tasks. Enthusiastic participants perform these micro-tasks while adhering to industry-defined accuracy standards within allocated budgets. Our crowd-sourcing platform follows a reactive execution process, involving planning, assignment, and execution stages. Additionally, we introduce a task monitoring algorithm that provides performance control mechanisms, allowing for strategic budget utilization and establishing a robust foundation for the platform. Simulation reveals five copies outperforming three copies in achieving A^*, with three copies requiring 76 times more tasks. Five copies exhibit 82% success vs. three copies' 77%, reducing task incompleteness. Increasing task copies challenges budget constraints, and machine accuracy $\alpha_M = 0.5$ achieves 18.12% and 4.825% more completion at a higher cost.**

***Index Terms*—Crowdsourcing; task scheduling; human augmented computing.**

I. Introduction

Crowd-sourcing is the process of outsourcing tedious tasks to a large networked group of people, commonly referred to as the "crowd." This approach involves soliciting contributions from an online community, as opposed to traditional employees. The term "crowd-sourcing" is derived from the combination of "crowd" and "outsourcing," and it is distinct from general outsourcing in that the work is obtained from a specific group identified by a proper name [1]–[3].

Crowd-sourcing enables the rapid mobilization of tasks that require specialized training, on a global scale. Essentially, a crowd-sourcing system involves collaboration between requesters and workers [4]. The requesters have specific tasks that need to be completed within defined timeframes, while the workers are willing to perform these tasks in exchange for payment. This model works particularly well for tasks that involve human intelligence, such as emotion judgment from social networks [5], analysis of Twitter data [6], processing large email datasets [7], extraction of medical named entities [8], and object recognition in photographs [9], [10]. In such cases, human workers can outperform high-end computers.

Online crowd-work platforms, such as oDesk [11], focus on specific areas of expertise. These platforms support various skills like web development, programming/software development, graphic design, writing, and administrative support.

In online crowd-sourcing platforms, tasks are distributed in a manner that requires workers to search for suitable micro-tasks. While the task selection process may not be efficient, the time spent on task selection is comparable to the time spent on task performance, considering the small payments involved. Since the crowd-sourced pool is often diverse in terms of ethnicity and education, it is important to investigate and identify appropriate tasks for human workers to generate interest and ensure effective task completion.

One of the widely used crowd-sourcing platforms is Amazon Mechanical Turk (MTurk), which outsources small tasks called Human Intelligence Tasks (HITs) to a global workforce [12]. The strategy behind MTurk is to offer small payments, often just a few cents, for simple micro-tasks. This approach allows industries to avoid hiring fixed employees. As of 2015, data from the MTurk website indicated that there were 312,568 available HITs with payment ranges from US $0.01 to US $44.16 [13]. In platforms like Amazon Mechanical Turk, workers who pass qualification tests are classified as qualified task workers, while those who don't are considered unqualified. This allows the platform to redistribute tasks accordingly.

Additionally, recommendation processes [14] aid in helping participants find preferred tasks more easily and quickly, encouraging greater worker contribution and expanding the crowd population for gathering opinions [15]. Recommendation systems [16] are also employed to suggest relevant items to users, facilitating the assignment of ideal user-task pairs for optimal outcomes. User ratings are proposed to generate ranking lists of items as suggestions, ensuring the best task

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INTERNATIONAL JOURNAL with Scopus Indexed

1.	**Basavaraj G.N, Karthik S.A and Prasad AY** Published a paper title "Recent Study on Energy Efficient Cluster Based Algorithms for Wireless Sensor Network" Acta Scientific Computer Science, Volume-5, Year 2023, pp.46-53.

ACTA SCIENTIFIC COMPUTER SCIENCES
Volume 5 Issue 3 March 2023
Review Article

Recent Study on Energy Efficient Cluster Based Algorithms for Wireless Sensor Network

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Abstract

Wireless Sensor Networks (WSNs) are made up of micro-sensor nodes with limited energy with processing capability in a constrained environment. WSN monitors physical and environmental conditions of many applications (e.g., health, military, home). Dense numbers of sensors are deployed to operate autonomously in different conditions of the environment. The main problem of WSN is maintaining network lifetime for a long time using low battery Sensor Nodes (SNs). Sensor nodes are frequently organized into distinct, non- overlapping groups termed clusters to provide high scalability with improved data aggregation. The pathways for data transfer in Wireless Sensor Networks (WSNs) are chosen in such a way that the total energy consumption is reduced to optimize network lifespan. We review advancements in clustering, classification of clustering properties and prominent cluster-based algorithms.

Keywords: LEACH; Clustering; Cluster Head; CH Selection; Wireless Sensor Network; Energy Efficient; Network Lifetime

Introduction

A Wireless Sensor Network (WSN) consists of a large number of Sensor Nodes (SNs) called "tiny devices" for monitoring areas. The data is processed at Cluster Head (CH) and then sent to the Base Station (BS) where a user can connect to the internet. The Low power consumption, dynamic topology, low energy, node failure, mobility, short-range broadcast communication, multiple hop routing, and a massive deployment scale are significant characteristics of a WSN [1]. The node consists of five basic components: the sensor unit, the ADC, the CPU, the power unit, and the communication unit [2]. A sensor node is a Micro-Electro-Mechanical System (MEMS) [3] that responds to changes in physical conditions like temperature and pressure. Many applications use sensors to gather information with a specific purpose. Sensors are being used in medical devices, home appliances, and even the military. In military targeting systems, sensor networks play a significant role in communications, computing, intelligence, and surveillance. It is easier to monitor and assist handicapped patients. The WSNs are self-organizing, quick to deploy and fault tolerant.

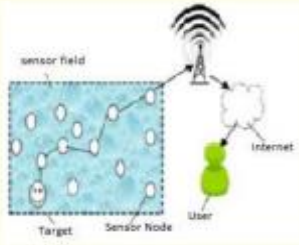

Figure 1: Architecture of Wireless Sensor Network.

The construction of WSN is shown in Figure 1 where SNs are spread out in sensor fields and connected for gathering data from the environment and then sending it directly to the Base Station. A sensor node collects data based on its sensing mechanisms observation and transmits aggregated data packets to the base station. The Base Station may be placed at a considerable distance from the sensor nodes.

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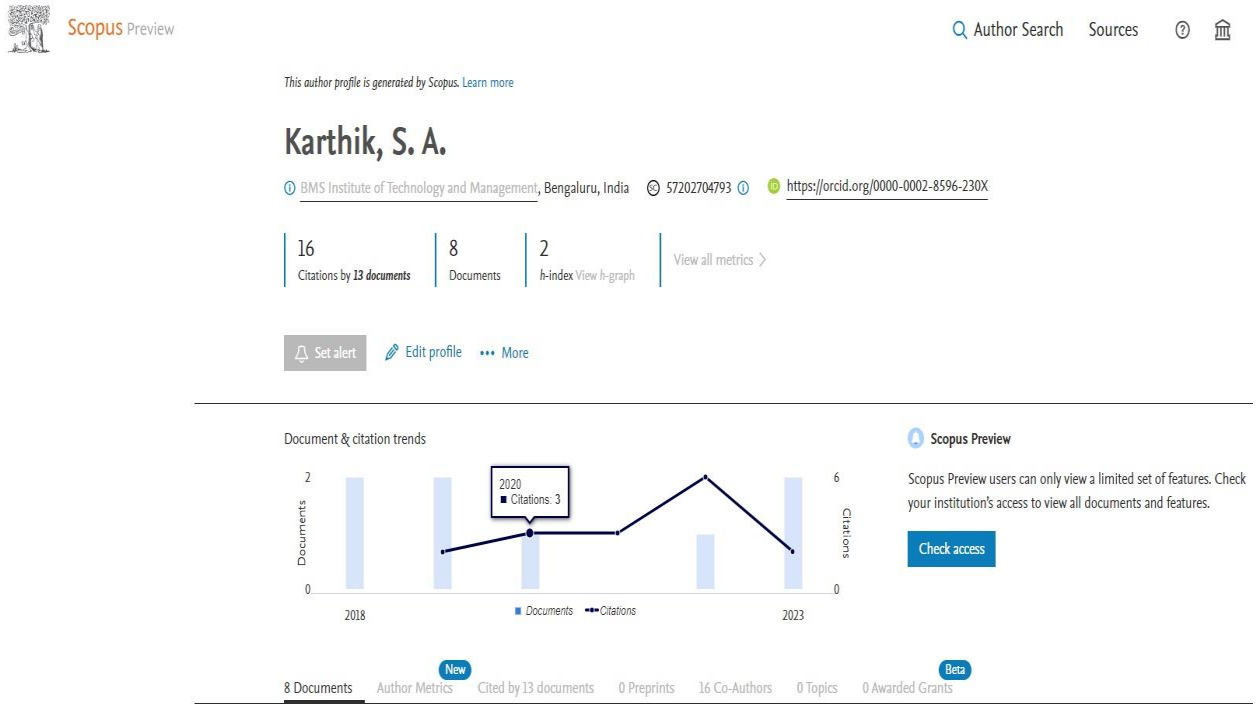

INTERNATIONAL JOURNAL with Scopus Indexed

1.	**Basavaraj G.N, Karthik S.A and Prasad AY** Published a paper title "Recent Study on Energy Efficient Cluster Based Algorithms for Wireless Sensor Network" Acta Scientific Computer Science, Volume-5, Year 2023, pp.46-53.

Book Chapter with Scopus Indexed

1.	**S. A. Karthik, R. Hemalatha, R. Aruna, M. Deivakani, R. Vijaya Kumar Reddy, Sampath Boopathi** Published a Book Chapter title "Study on Healthcare Security System-Integrated Internet of Things (IoT)" Source Title: Perspectives and Considerations on the Evolution of Smart Systems DOI: 10.4018/978-1-6684-7684-0.ch013

Study on Healthcare Security System-Integrated Internet of Things (IoT)

S. A. Karthik (/affiliate/s-a-karthik/448391/), R. Hemalatha, R. Aruna, M. Deivakani, R. Vijaya Kumar Reddy, Sampath Boopathi (/affiliate/sampath-boopathi/437094/)

Source Title: Perspectives and Considerations on the Evolution of Smart Systems (/book/perspectives-considerations-evolution-smart-systems/309144)
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Abstract

The internet of things (IoT) has the potential to transform healthcare by fusing the most significant technological and scientific advances in the fields of automation, mobility, and data analytics to improve patient care. IoT links sensors, actuators, and other devices to a network in order to collect and disseminate communication messages that an organization may then evaluate. To track health parameters, the suggested paradigm focuses on sensors, communications protocols, and cloud technologies. The study looks at the crucial elements of a healthcare IoT system. For the control, security, and protection of IoT networks, data confidentiality and authentication are crucial. For the purpose of resolving security challenges, flexible infrastructure is necessary. The goal of the chapter is to discuss IoT security concerns in healthcare devices and offer recommendations for future research to enhance the use of IoT devices.

Chapter Preview

Top

Introduction

Thanks to the abundance of IoT devices that are available in various locations and the enormous amounts of data and information they contain, Internet of Things (IoT) healthcare systems offer a solid foundation for smart sensor technology. Huge volumes of data are released by IoT-based healthcare systems, yet security and privacy are crucial concerns. IoT sensors and their released data can be supported by object and cloud network topologies. The Internet of Things (IoT) is a system of linked, intelligent sensors that can perceive their surroundings and share data and processes from many areas. It is utilised in a variety of industries, including smart transportation, finance, railroads, and healthcare. Different domains are involved with smart IoT-based sensors, particularly in smart healthcare systems. The majority are offered in stores. IoT infrastructure security design is crucial for a variety of technological, scientific, and commercial reasons, including privacy and security. Security concerns are governed by IoT architectures, technologies, and design approaches. The internet of things architecture is divided into layers, and each layer makes use of a different topology and piece of hardware to maintain sensor data standardisation, privacy protection, and parameter coordination(Polu, 2019).

INTERNATIONAL CONFERENCE with Scopus Indexed

1.	**Bhavya K.R, Pravinth Raja S., Sunil Kumar B, Karthik S.A and Chavadaki S**. Published a paper title "An Efficient Machine Learning Approach for Apple Leaf Disease Detection" Smart Innovation, Systems and Technologies, 2023, 315, pp.419–429.

	Home > Intelligent Computing and Applications > Conference paper **An Efficient Machine Learning Approach for Apple Leaf Disease Detection** K. R. Bhavya, S. Pravinth Raja, B. Sunil Kumar, S. A. Karthik & Subhash Chavadaki Conference paper | First Online: 14 November 2022 140 Accesses Part of the Smart Innovation, Systems and Technologies book series (SIST,volume 315) Abstract Apples are one of the most popular agricultural products. Despite being one of the most widely grown commodities, apple demand is on the rise. As a result, this crop, which was formerly only grown in temperate climates, is now being grown in tropical climates. Pest and disease infestations are a major issue that affects apple output each year. In this paper, an approach has been made which combines machine learning and image processing concepts to identify diseases from infected apple leaves. This method effectively differentiates between diseased and non-diseased apple leaves. Pre-processing of the image is done using grab cut segmentation which is the primary stage in the disease identification process. The infected type from the original leaf image is recognized by 96% using the segmentation of the diseased portion, and multiclass SVM detects the infected type from 500 images using the feature extraction. https://link.springer.com/chapter/10.1007/978-981-19-4162-7_39
2.	**Karthik, S.A., Basavaraj, G.N., Seemanthini, K.** ***Published a paper title*** " Hybrid Approach for Retail Store Auditing Using CRNN " 2023 International Conference on Network, Multimedia and Information Technology, NMITCON 2023, 2023

2023 International Conference on Network, Multimedia and Information Technology (NMITCON)

Hybrid Approach for Retail Store Auditing Using CRNN

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Abstract—**In today's world, On-Shelf Availability (OSA) is critical in the field of selling and marketing. It is an important measure of performance for the retail sector that has a significant impact on profit and customer retention. Out-of-Stock causes sales to decline and customer retention to dwindle. Because of the firm's fierce competition, vendors and providers place attractive offers to please customers and keep them returning to their shops. In this work, a hybrid framework has been proposed to prevent out-of-stock problems by utilizing IoT and deep learning-based models for product label detection and recognition. To extract objects and their features a recurrent convolutional neural network has been utilized. IoT-based sensors help identify minimum loads on the shelf. The proposed approach is linked to a camera apparatus which detects inventory levels on the racks and generates signals to the store manager if items are removed from the rack or misaligned. The experimental results show that by using the proposed approach, it is feasible to recognize front-facing items and empty content on the rack with an accuracy ranging from 83%-99%.**

Keywords— **OSA (On-shelf Availability), OOS (Out of Stock), Retail Store, Internet of Everything (IoE), Neural network.**

I. INTRODUCTION

. Digitalization is going to ride the very next ripple of online retailing. E-retailers entice customers with 'anywhere, anytime' shopping, rapid shipment, product recommendations, hassle-free returns and so forth. Quite apart from technological innovations, buyers' requirements are altering at an alarming rate, as the popularity of more efficient, personalized, and Omni channel general merchandise shopping experiences grows. Vendors are seriously reconsidering their in-store plans to keep up with technological developments and growing competition from the online space.

The On-Shelf Availability (OSA) [1] of a commodity that a buyer is looking for is an important criterion in ensuring a positive shopping experience. It is a measure of the number of products in marketable status that are readily accessible to a buyer at the moment and place where he expects to purchase the item. In contrast to OSA, the phrase "Out of Stock" (OOS) is commonly used to describe a scenario in which a buyer cannot search for an item on a dedicated rack.[2]. As little more than the potential buyer has a nasty perception, which may harm the consumer response. Phantom inventory can be another major cause of shelf OOS. The latter occurs when the inventory control system indicates that an item is available, although it is not available. This can happen if a product is missing or damaged from the shelf, is recalled, or is left in the customer's cart [3].

In today's world strengthening the shopping experience for customers seems to be a key factor in retaining buyers. One of the most feasible solutions to this retail in-store problem is to enforce smart shelves, which have electronically connected shelves that can instantaneously keep track of inventory in a retail establishment. Smart Shelves technology [4] has the potential to improve both the purchasing perceptions of consumers and the selling experience of retailers. To help store auditing and to recognize the text present in the product a novel NN-Model [5] along with an IoT sensor has been used. To measure the minimum weight of a product inside the rack, IoT sensors are used and based on threshold weight products can be brought back into racks this helps store managers to solve the problem of OOS and ensures on-shelf –availability.

The next task is to identify which product is not available on the rack. To help store auditing IoT sensors are used to measure minimum weights in shelves and to detect the alphabet sequence which is labelled on item packets a hybrid neural network algorithm has been employed. To solve the classic problem of text sequence detection present in an image a deep learning approach has been made.

In practical scenarios, visual objects like text in an item packet, and handwritten characters appear consecutively. Identification of such sequence is one of the major tasks which usually require a learning model to predict the labels of an object. Identification of such labels is considered to be a sequence recognition problem. A unique variation in such object detection is that the length of the characters may vary drastically. The machine learning model called CNN[6] is the best model for sequence recognition problems but it demands a fixed dimension (length). The mentioned issue can be addressed by identifying each character separately and recognizing identified characters using the DCNN model. Such an approach requires a lot of training accuracy. RNN can also be used to detect objects in sequence. The

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3. **Dr. Kanthraju V, Dr. Harish Kumar N, Dr. Karthik S A** Published a paper title "AIRFACTOR- Bangalore Based Air Pollution Monitoring and Prediction Application Using Machine Learning". International Conference on Network, Multimedia and Information Technology (NMITCON), 2023

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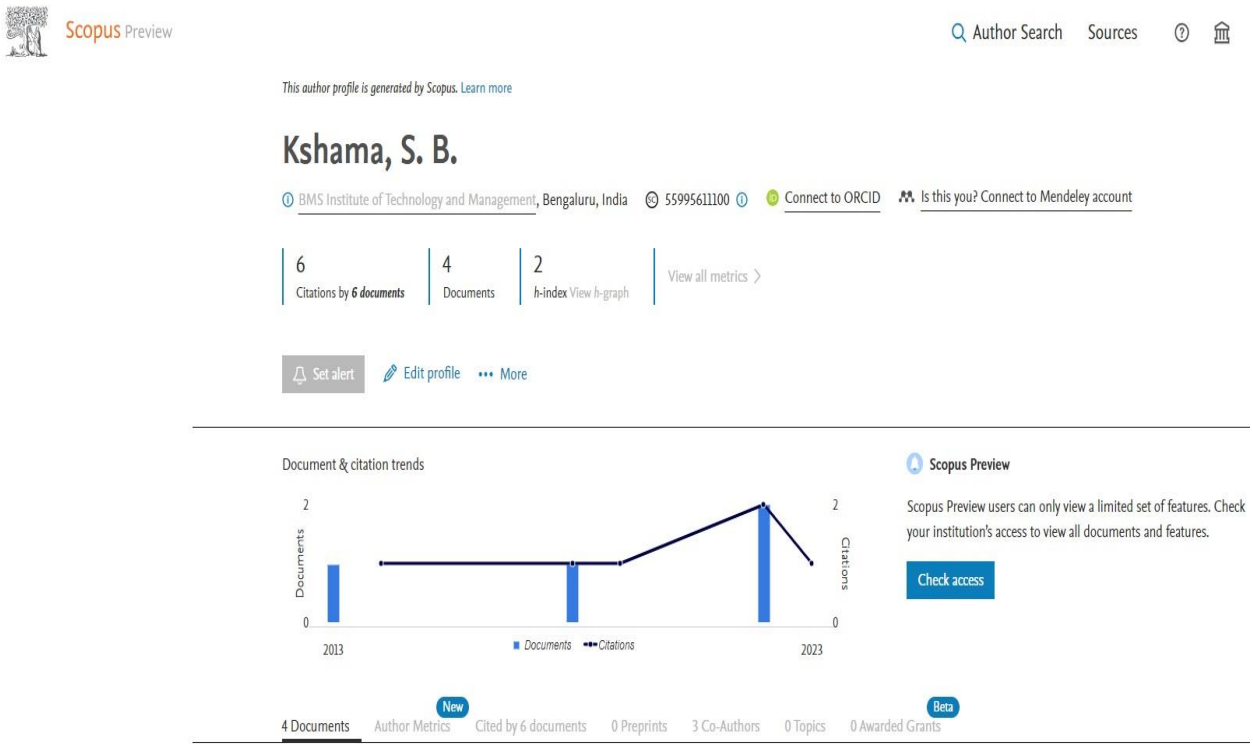
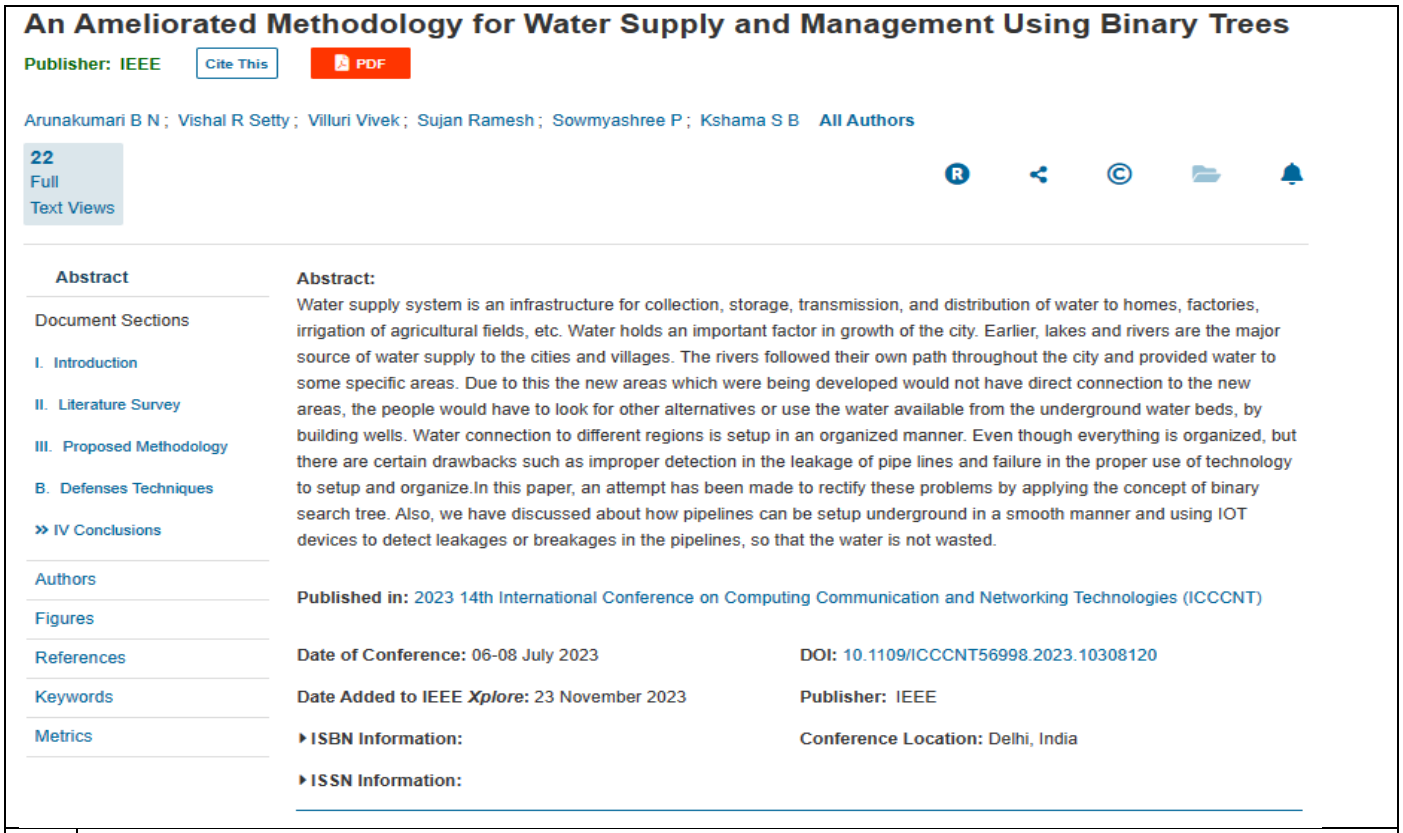


INTERNATIONAL CONFERENCE with Scopus Indexed

1.	**Kshama S B, Arunakumari B N** . Published a paper title "An Ameliorated Methodology for Water Supply and Management Using Binary Trees" 2023 14th International Conference on Computing Communication and Networking Technologies (ICCCNT), **DOI:** 10.1109/ICCCNT56998.2023.10308120.



An Ameliorated Methodology for Water Supply and Management Using Binary Trees

Publisher: IEEE Cite This PDF

Arunakumari B N ; Vishal R Setty ; Villuri Vivek ; Sujan Ramesh ; Sowmyashree P ; Kshama S B All Authors

22 Full Text Views

Abstract

Document Sections

I. Introduction

II. Literature Survey

III. Proposed Methodology

B. Defenses Techniques

» IV Conclusions

Authors

Figures

References

Keywords

Metrics

Abstract:

Water supply system is an infrastructure for collection, storage, transmission, and distribution of water to homes, factories, irrigation of agricultural fields, etc. Water holds an important factor in growth of the city. Earlier, lakes and rivers are the major source of water supply to the cities and villages. The rivers followed their own path throughout the city and provided water to some specific areas. Due to this the new areas which were being developed would not have direct connection to the new areas, the people would have to look for other alternatives or use the water available from the underground water beds, by building wells. Water connection to different regions is setup in an organized manner. Even though everything is organized, but there are certain drawbacks such as improper detection in the leakage of pipe lines and failure in the proper use of technology to setup and organize.In this paper, an attempt has been made to rectify these problems by applying the concept of binary search tree. Also, we have discussed about how pipelines can be setup underground in a smooth manner and using IOT devices to detect leakages or breakages in the pipelines, so that the water is not wasted.

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DOI: 10.1109/ICCCNT56998.2023.10308120

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1.	**Kshama S B, Arunakumari B N** . Published a paper title "Simplifying Structure and Pattern in Complex Social Networks Using Graph Isomorphism" 2023 14th International Conference on Computing Communication and Networking Technologies (ICCCNT), DOI: 10.1109/ICCCNT56998.2023.10307326**.**

Simplifying Structure and Pattern in Complex Social Networks Using Graph Isomorphism

Publisher: IEEE | Cite This | PDF

Arunakumari B N ; Kshama S B ; Swasti S ; Sameeksha B H ; Sonia Puri ; Rubini P A All Authors

25 Full Text Views

Abstract

Document Sections

I. Introduction

II. MOTIVATION

III. Literature survey

IV. Proposed methodology

V. RESULT ANALYSIS

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Keywords

Metrics

Abstract:
In recent years, networks have grown in size and complexity, traditional network testing methods have become time-consuming and inefficient. As a result, there is a need for more efficient and reliable network testing methods. One important topic in the field of network testing is graph pattern matching. Network analysis relies on graph pattern matching. The paper discusses the use of graph isomorphism for network testing. This paper also gives an overview of recent advances in isomorphism testing, which determines if two networks are structurally identical despite potential labeling discrepancies between them. The combination of isomorphism and pattern matching in network analysis is used to identify equivalent structures in different networks. This approach is used to identify and compare common patterns in complex network structures, such as those found in social networks.

Published in: 2023 14th International Conference on Computing Communication and Networking Technologies (ICCCNT)

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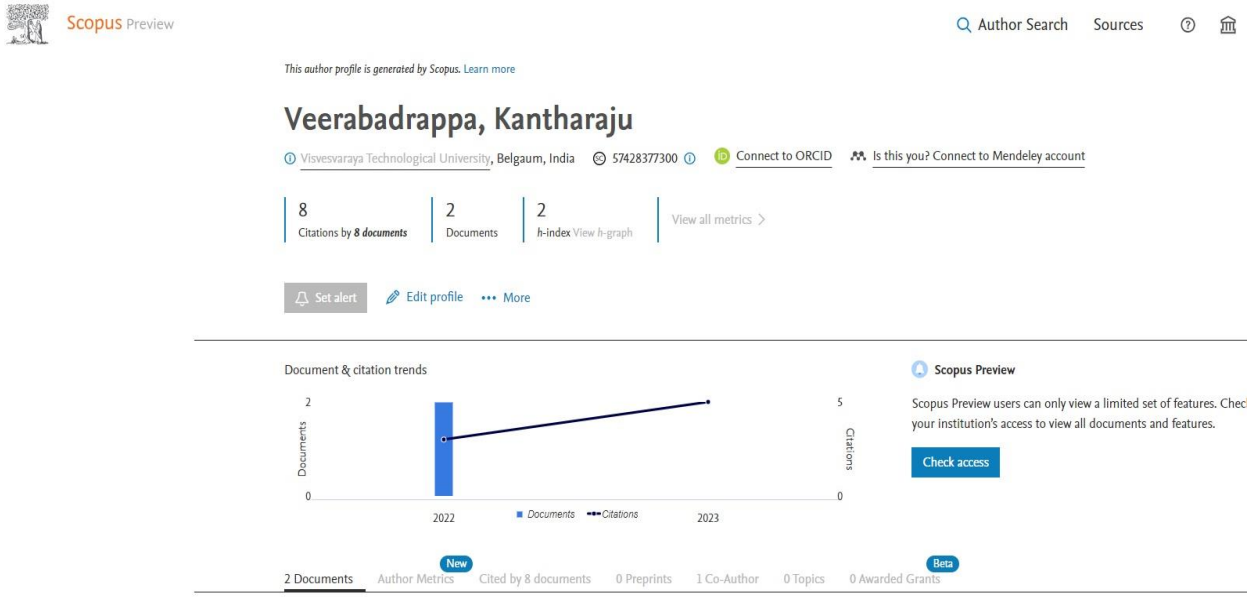

INTERNATIONAL CONFERENCE with Scopus Indexed

1. **Dr. Kanthraju V, Dr. Harish Kumar N, Dr. Karthik S A** Published a paper title "AIRFACTOR- Bangalore Based Air Pollution Monitoring and Prediction Application Using Machine Learning". International Conference on Network, Multimedia and Information Technology (NMITCON), 2023

2023 International Conference on Network, Multimedia and Information Technology (NMITCON)

AIRFACTOR- Bangalore Based Air Pollution Monitoring and Prediction Application using Machine Learning

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***Abstract*—Due to the recent rise in the pollution levels in most metropolitan cities, we realized the lack of awareness and prevention measure taken by the general public to reduce it. If we are not aware of the pollution around us, we won't know what to do. On top of that Air is not visible to the naked eye, and it is no doubt that the tiny particles will also not be visible to the naked eye. Air is what keeps living things alive, a high level of pollution in that needs to be monitored and maintained. This suggests the urgent need of an asset that can predict the air pollution levels in the future as well as create awareness and cautions about the hazardous effects of air pollution. A Mobile Application called AIRFACTOR is developed as it is easily accessible to any user, which will help its users gain more knowledge about air pollution and air pollutants in general. Along with that it will also show the near real-time levels of pollution for the city of Bangalore, and also the Air Quality Index that changes over time. The paper aims to acknowledge that the pollutant PM2.5 is not the only pollutant that degrades the air quality, but other pollutants are also present, and thus predicts the levels of the pollutants PM 10 and CO.**

***Keywords*—Air Pollution, Mobile Application, SVM, LGB**

I. Introduction

Pollution is caused by the presence of harmful pollutants in the environment. These pollutants are nothing but harmful particles and materials that are abundant in the environment. One common example of a pollutant would be the everyday trash. Pollution can be caused by certain natural phenomena as well as due to human activities. Pollution occurs in Air, Land and Water. air pollution is the presence of pollutants in the atmospheric realm, in the air around us. Unfortunately, unlike land and water pollutants which are visible to the naked eye, pollutants in the air are too small to be noticed by the naked eye (their size going as low as less than 2.5 micrometres, like PM 2.5). These small and unnoticeable particles in the air are more harmful because these particles tend to pass the nose and throat easily and enter the lungs directly, causing respiratory issues. There are many common things around us that contribute as pollutants, causing pollution in the atmosphere. The most commonly seen elements are the emissions from factories. The smoke that comes out of the chimneys of an industrial factory is one of the most commonly seen air pollutants. Even though one can't see exactly what particles are getting released in the air, it can be assumed that they do contain harmful particles that pollute the atmosphere. There is a need for an asset that can inform the common user of the pollution levels and also educate them about the effects of the pollutants. AIRFACTOR is a flutter and python based application built solely for the domains related to air pollution. This paper focuses on several agendas related to air pollution in the region of Bangalore. Section II discuss of existing systems available. Section III focus on system design and implementation. Section IV works on results and discussion followed by conclusion and future scope in Section V.

II. Related Work

Bhrugubanda et. al[1] in their paper discussed the HazeEst model. HazeEst is a machine learning model that uses both dense mobile sensor data and sparse fixed station data together to calculate air pollution levels at specific times in Sydney. This system is assessed through several regression models followed by ten fold cross validation. Field trials were used to validate the air pollution values estimated by the model. Lasko K, Vadrevu KP et.al[2] use weather information and different types of satellite datasets to depict the status of air pollution over Vietnam and especially over the city of Hanoi, in this study. The main goal of this study was to assess whether it was possible to observe the burning emissions from rice residue using data obtained from satellites in a cloud coverage region. L Scheibenreif et.al [3], in their paper, assert that monitoring the air quality is essential for ensuring public health. Unfortunately, measuring the criteria pollutants with accuracy and necessary equipment is usually expensive. This study brings forward an inexpensive method based on machine learning to predict pollutant values, while the more prone areas can rely on the sensor stations. Bellinger C et.al[4] systematically conducted a literature review of applications of Machine Learning and Data Mining in the area of air pollution epidemiology. The huge datasets of measured air pollutants, environmental factors and public health can be utilized by Machine Learning

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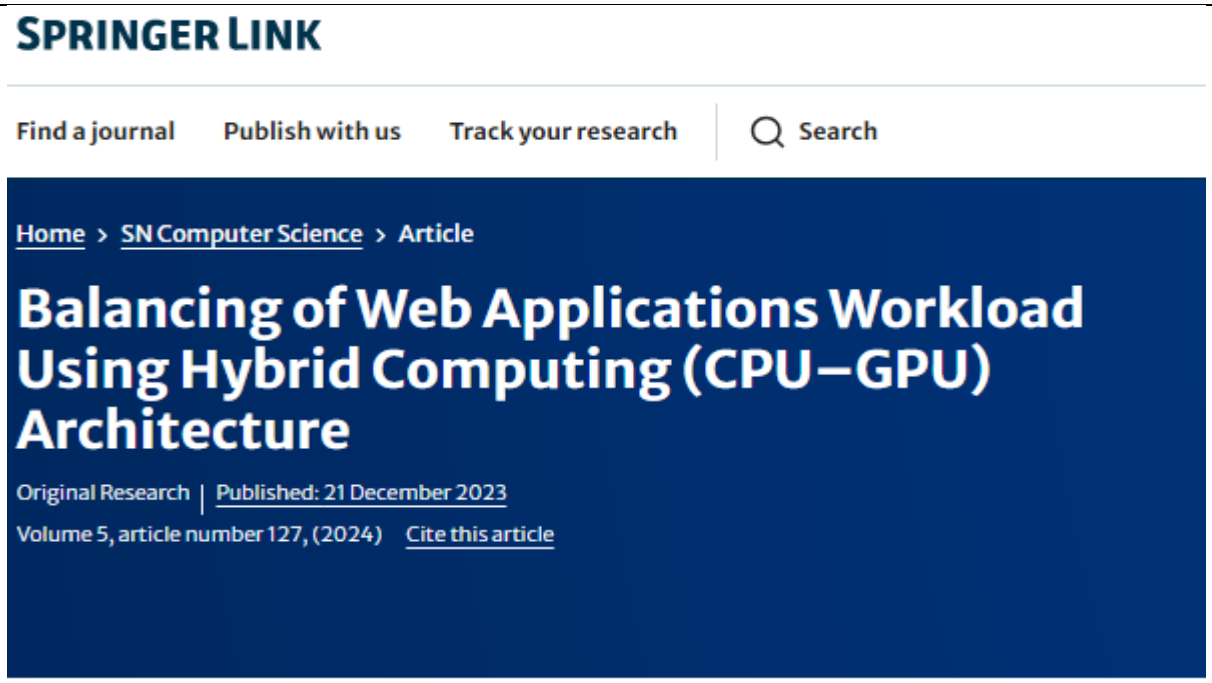
2. **Dr. Kanthraju V, Dr. Harish Kumar N** Published a paper title "Balancing of Web Applications Workload Using Hybrid Computing (CPU–GPU) Architecture". SN COMPUT. SCI. 5, 127 (2024). https://doi.org/10.1007/s42979-023-02444-2



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Balancing of Web Applications Workload Using Hybrid Computing (CPU–GPU) Architecture

Original Research | Published: 21 December 2023

Volume 5, article number 127, (2024) Cite this article

B. N. Chandrashekhar, V. Kantharaju, N. Harish Kumar & Lithin Kumble

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Abstract

The current network architecture does not properly manage the load of web applications or keep track of user–web application interaction. There are concerns regarding proper memory ratio, data transfer between user and device, host outstanding procedures, and tenure usage of CPUs and GPUs because centralized administration is absent in the mainstream network system. It's crucial to have a reliable and improved hybrid web application workload balancing solution in order to make the graphical resources highly available to the network environment. It automates processes that need to be completed and cuts down on processing time overall, lowering administrative costs and processing times. Hybrid computing also includes service delivery, which determines where each job provides the respective services with respect to each user. The database stores each user's information, which is used for authentication. This reduces the time required for users to log in each time, determines the resources needed, and keeps track of which users are using which resources.

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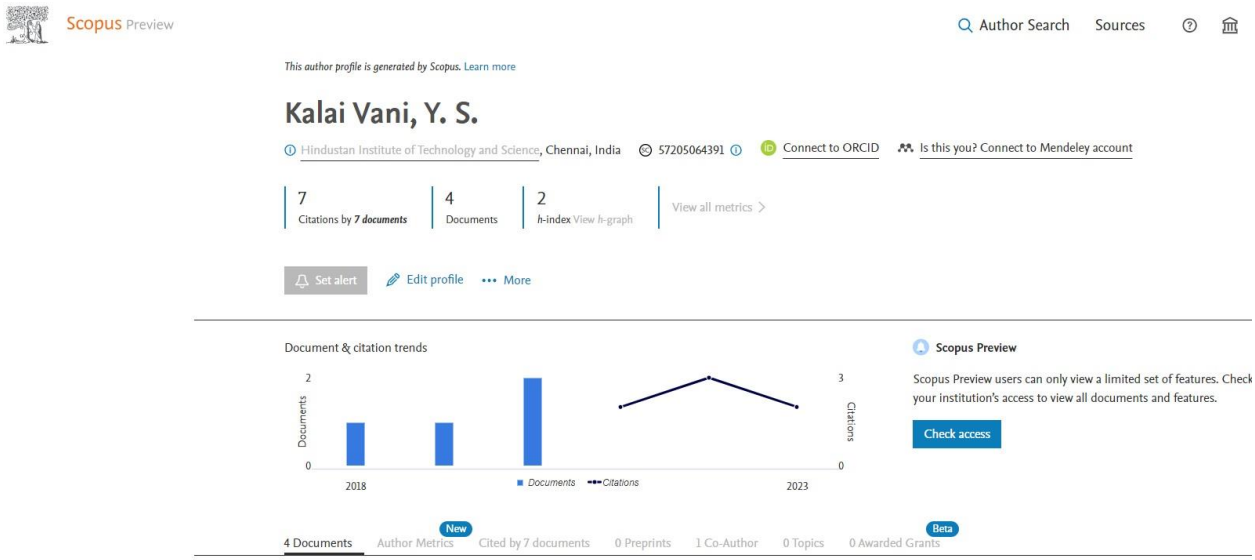

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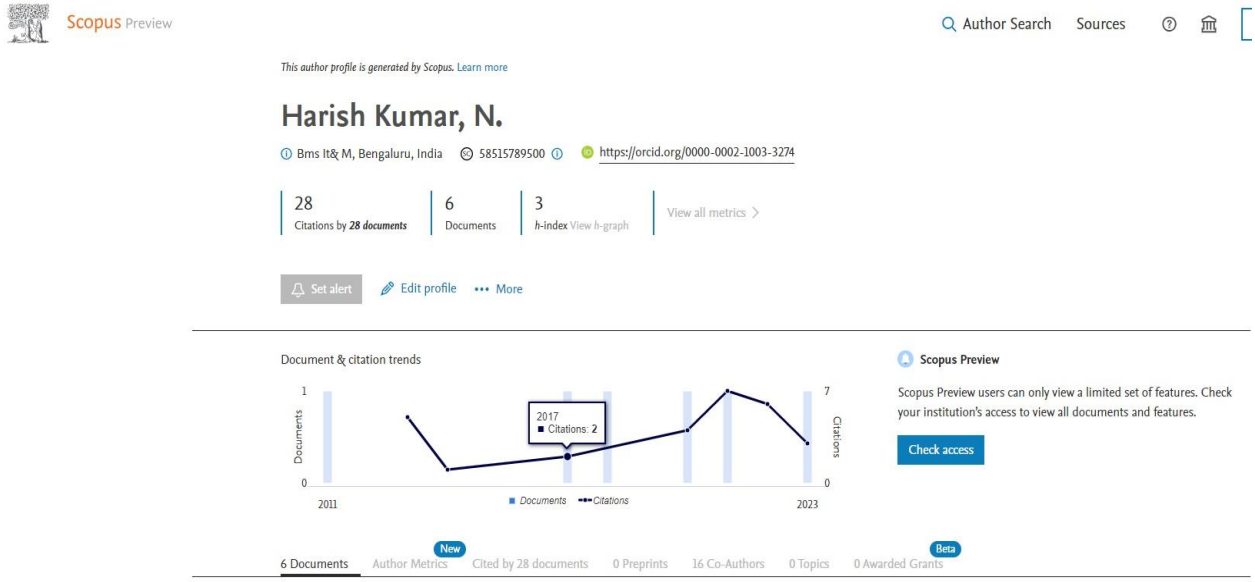

INTERNATIONAL CONFERENCE with Scopus Indexed

1.	**Harish Kumar, N., Datta Shashank, C., Adithya, N.,** Published a paper title "A Comprehensive Survey on Weed Identification in Agriculture using Machine Learning" 2023 International Conference on Artificial Intelligence and Applications, ICAIA 2023 and Alliance Technology Conference, ATCON-1 2023 - Proceeding, 2023 DOI: 10.1109/ICAIA57370.2023.10169741

A Comprehensive Survey on Weed Identification in Agriculture using Machine Learning

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***Abstract*— Unchecked weed growth can seriously affect crop yield and quality. Excessive use of herbicides to control weed growth is harmful to the environment. Identifying areas infested with weeds helps in the selective chemical treatment of those areas. Similarly, we can also implement precision spraying techniques for the crops. Advances in farm image analysis have created a solution for identifying weedy plants. However, these are supervised learning methods that require many manually annotated images. Hence, these approaches are not economically feasible for individual farmers due to the wide variety of crop species grown. In this review, algorithms, such as CNN and CNN-based algorithms, K-Means, SVM, Fuzzy algorithms, Hough transform and Gabor filter and others to accurately estimate weed distribution and density are covered in detail. Deep-learning-based methods to robustly estimate weed density and distribution are discussed in detail in this review. In this paper, an overview of image segmentation methods, detection approaches and various classification techniques are identified. Further, the existing solutions are presented with their own challenges.**

***Keywords*— Weed Detection, Precision Spraying, Deep learning, CNN**

I. INTRODUCTION

The most crucial sector for maintaining humankind's existence remains to be agriculture. The equipment that farmers use to cultivate their farms has seen major advances. Weeding, or the removal or treatment of unwanted plants, is a typical element of farming. Weeds are plants that a farmer does not want to grow because they hinder or restrict the growth or production of crops. They achieve this by vying with crops for scarce resources like water, nutrients, and sunlight. To guarantee a healthy crop output, it is crucial to eradicate certain plants specifically. However, the conventional method of spraying agrochemicals on all the farmland to manage weeds is not only costly and time-consuming, but it also has a detrimental effect on soil properties, freshwater quality, and human health. Chemical weeding can be substituted by manual weeding, which involves handpicking weed plants. But this method requires a lot of time and work. Precision farming seeks to reduce the number of conventional inputs needed to cultivate crops while increasing crop yields and profitability. Crop yield estimation, maintaining soil health by reducing chemical use, lowering material and resource costs, mechanical weeding and fertilizer distribution, and fruit and vegetable detection and picking, are a few applications of precision agriculture.

The weeding of weed plant patches with chemicals has been done using autonomous robots. To recognize and locate weed plants, these robots rely on technology, such as machine vision. Pre-processing, segmenting, feature extracting, classifying are the four steps of image processing-based weed identification approach. Pre-processing, which often includes a variety of image improvement techniques such color space transformation, gets the input image ready for segmentation. The enlarged image is then divided into two sections: the background and the vegetation. Two techniques for segmentation are found: learning-based and index-based. By comparing the intensity value of each pixel with a threshold parameter, the index-based technique distinguishes between vegetation and background. When crops and weed plants overlap and there are different lighting conditions, this method is ineffective. The most effective technique for correctly identifying vegetation is to segment it using learning-based methods, which have been shown to solve this issue. As a result of segmentation, the vegetation mask is generated, which includes pixels from both crops and weeds in the same class. The physical structure, spectral characteristics, visual trends, and spatial positions of the crop and weed plants are hence used to calculate a manually constructed feature vector. To differentiate the weeds from the vegetation mask, the classifier takes these features into account. The image processing-based method reduces the number of herbicides sprayed while cutting down on labor and time. The main objective of our study is to assess a semi-supervised strategy for weed identification and density estimate to decrease the amount of individually labelled training data needed for DNNs. We can increase the acceptability rate of different species in varied environments by lowering our emphasis on detailed segmentation networks.

The ability of a semi-supervised system to accurately predict weed spread and density across the fields from a color image captured by an unmanned robot has been demonstrated. Here, the emphasis is on pixel-by-pixel segmentation, which identifies areas that should receive a targeted application of agrochemicals. This approach does not need pixel-by-pixel annotations, unlike deep learning segmentation networks, which increase its scalability and generalizability. This method uses an unsupervised CNN to

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2.	**Dr. Kanthraju V, Dr. Harish Kumar N, Dr. Karthik S A** Published a paper title "AIRFACTOR- Bangalore Based Air Pollution Monitoring and Prediction Application Using Machine Learning". International Conference on Network, Multimedia and Information Technology (NMITCON), 2023

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