



SYMBIOSIS INSTITUTE OF TECHNOLOGY (SIT)

Constituent of Symbiosis International (Deemed University), Pune

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THE BIENNIAL NEWSLETTER FROM THE DEPARTMENT OF CSE

EDITION: JUL - DEC 2020

TRENDING THIS SEMESTER

- "Students' Achievements Shine: Department students showcase their skills on the sports field"
- Professors Make Great Technological Advancements: Study on Distributed Incremental Clustering Algorithms published!
- Professors publish several exciting studies in the vast and ever-evolving field of Machine Learning
- Students Gain Global Experience: Department Students participate in international hackathons to gain valuable experience and wisdom

We are thrilled to present this issue of the biennial CSE departmental newsletter, "TechnoWiz", keeping you updated on the latest achievements and groundbreaking advancements from the Department of Computer Science and Information Technology. With a resolute pursuit of excellence, we strive to captivate your imagination and inspire your unwavering zeal for the ever-evolving realm of CSE.

In this edition, we take you on an enlightening journey, showcasing the creative efforts and remarkable achievements of our brilliant faculty, diligent students and esteemed alumni on the way. Their unwavering dedication and relentless pursuit of knowledge have resulted in groundbreaking research breakthroughs, awe-inspiring projects, and influential contributions shaping the future of technology.





VISION AND MISSION

VISION OF THE DEPARTMENT

To evolve as a centre of excellence in Computer Science and Engineering to produce skilled and proficient global professionals to build the society.

MISSION OF THE DEPARTMENT

- To provide the conducive environment for establishing students in the global platform of research and innovation.
- To educate students on cutting edge technologies with problem solving capabilities, leadership and teamwork skills.
- To inculcate the professional values with lifelong learning through curricular and co-curricular activities and create globally-aware disciplined citizens.
- To commence various initiatives for motivating students to work for the betterment of society.

PROGRAM EDUCATIONAL OBJECTIVES

PEO1: Apply their skills with research orientation and establish themselves globally.

PEO2: Apply problem solving and emerging technology skills for designing solutions .

PEO3: Apply technical and leadership skills to be a successful entrepreneur.



FACULTY'S ACHIEVEMENTS

Document details - Distributed Incremental Clustering Algorithms: A Bibliometric and Word-Cloud Review Analysis

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Science and Technology Libraries
Volume 39, Issue 3, 2 July 2020, Pages 289-306

Distributed Incremental Clustering Algorithms: A Bibliometric and Word-Cloud Review Analysis(Article)
Mulay, P., Joshi, R., Chaudhari, A. R.
Symbiosis Institute of Technology, Symbiosis International (Deemed University), Pune, India

Abstract
"Incremental Learning (IL)" is the niche area of "Machine Learning." It is of utmost essential to keep learning incremental for ever-increasing data from all domains for effectual decisions, predications and solving problems. This can be achieved effectually by applying "Incremental Clustering" methods on real-time data sources. IL can be achieved by "Incremental Clustering" easily as well as effectively. To achieve worldwide data analysis related to the data and to achieve broader perspectives, it is essential to deploy "Incremental Clustering" algorithms on distributed platforms, which will enable them to accept data from varied sources; analyze it and produce distributed worldwide solutions. This paper hence focuses on understanding the current status of "Distributed Incremental Clustering Algorithms (DICA)," its scope, limitations and other details so as to formulate better than the best algorithm in future. To enhance the analysis further Word-Clouds of impactful papers were explored and added in this paper, along with the details about platforms used to implement DICA by various upcoming researchers, readers and authors. © 2020 The Author(s). Published with license by Taylor & Francis Group, LLC.

Author keywords
Bibliometric clustering DICA distributed incremental incremental clustering incremental learning word cloud

Indexed keywords

Cited by 12 documents
Oliveira, A.S., Souki, G.Q., Silva, D. Service guarantees in an e-commerce platform: proposition of a framework based on customers' expectations, negative experiences and behavioural responses
(2023) Asia-Pacific Journal of Business Administration
Patil, R.R., Kumar, S., Rani, R. A Bibliometric and Word Cloud Analysis on the Role of the Internet of Things in Agricultural Plant Disease Detection
(2023) Applied System Innovation
Alkhamash, R. Bibliometric, network, and thematic mapping analyses of metaphor and discourse in COVID-19 publications from 2020 to 2022
(2023) Frontiers in Psychology
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Esteemed professors Dr. Rahul Joshi and Dr. Preeti Mulay published their study on Distributed Incremental Clustering Algorithms. The study was published by Routledge in July 2020. This paper focuses on understanding the current status of DICA, its scope, limitations and other details so as to formulate better than the best algorithm in future.

Our professors made yet another huge stride in the field of AI/ML as Dr. Pooja Kamat and Dr. Shilpa Gite got their study titled "LSTM-based Ensemble Network to enhance the learning of long-term dependencies in chatbots" published by EDP Sciences in December 2020.

Document details - LSTM based Ensemble Network to enhance the learning of long-term dependencies in chatbot

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International Journal for Simulation and Multidisciplinary Design Optimization
Volume 11, 2020, Article number 25

LSTM based Ensemble Network to enhance the learning of long-term dependencies in chatbot(Article)Open Access
Patil, S., Mudaliar, V.M., Kamat, P., Gite, S. R.
Symbiosis Institute of Technology, Symbiosis International (Deemed University), Pune, Maharashtra, India

Abstract
A chatbot is a software that can reproduce a discussion portraying a specific dimension of articulation among people and machines utilizing Natural Human Language. With the advent of AI, chatbots have developed from being minor guideline-based models to progressively modern models. A striking highlight of the current chatbot frameworks is their capacity to maintain and support explicit highlights and settings of the discussions empowering them to have human interaction in real-time surroundings. The paper presents a detailed database concerning the models utilized to deal with the learning of long haul conditions in a chatbot. The paper proposes a novel crossbreed Long Short Term Memory based Ensemble model to retain the information in specific situations. The proposed model uses a characterized number of Long Short Term Memory Networks as a significant aspect of its working as one to create the aggregate forecast class for the information inquiry and conversation. We found that both of the ensemble methods LSTM and GRU work well in different dataset environments and the ensemble technique is an effective one in chatbot applications. © S. Patil et al., published by EDP Sciences, 2020.

Author keywords
AI Chatbot Ensemble Method GRU LSTM Neural Turing machine RNN

Cited by 5 documents
Naveen, P., Haw, S.-C., Nadthian, D. Improving Chatbot Performance using Hybrid Deep Learning Approach
(2023) Journal of System and Management Sciences
Sobhana, M., Yamini, A., Hindu, K. Navbot—College Navigation Chatbot Using Deep Neural Network
(2023) Lecture Notes in Networks and Systems
Achuthan, S., Balaji, S., Thanush, B. An Improved Chatbot for Medical Assistance using Machine Learning
(2022) 5th International Conference on Inventive Computation Technologies, IICIT 2022 - Proceedings
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FACULTY'S ACHIEVEMENTS

Document details - Pollution weather prediction system: Smart outdoor pollution monitoring and prediction for healthy breathing and living

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Sensors (Switzerland)
 Volume 20, Issue 18, 2020, Article number 5448, Pages 1-25

Pollution weather prediction system: Smart outdoor pollution monitoring and prediction for healthy breathing and living(Article)(Open Access)

Pandya, S., Ghayyat, H., Sur, A., Awais, M., Kotecha, K., Saxena, S., Jassal, N., Pingale, G. &
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View additional affiliations

Abstract

Air pollution has been a looming issue of the 21st century that has also significantly impacted the surrounding environment and societal health. Recently, previous studies have conducted extensive research on air pollution and air quality monitoring. Despite this, the fields of air pollution and air quality monitoring remain plagued with unsolved problems. In this study, the Pollution Weather Prediction System (PWP) is proposed to perform air pollution prediction for outdoor sites for various pollution parameters. In the presented research work, we introduced a PWP system configured with pollution-sensing units, such as SDS021, MQ07-CO, NO2-B43F, and Aeroqual Ozone (O₃). These sensing units were utilized to collect and measure various pollutant levels, such as PM2.5, PM10, CO, NO₂, and O₃, for 90 days at Symbiosis International University, Pune, Maharashtra, India. The data collection was carried out between the duration of December 2019 to February 2020 during the winter. The investigation results validate the success of the presented PWP system. In the conducted experiments, linear regression and artificial neural network (ANN)-based AQI (air quality index) predictions were performed. Furthermore, the presented study also found that the customized linear regression methodology outperformed other machine-learning methods, such as linear, ridge, Lasso, Bayes, Huber, L₁-L₂-lasso, stochastic gradient descent (SGD), and ElasticNet regression methodologies, and the customized ANN regression methodology used in the conducted experiments. The overall AQI values of the air pollutants were calculated based on the summation of the AQI values of all the presented air pollutants. In the end, the web and mobile interfaces were developed to display air pollution prediction values of a variety of air pollutants. © 2020 by the authors. Licensee MDPI, Basel, Switzerland.

Author keywords
 Artificial neural network Healthy living Linear regression Pollution prediction Smart outdoor monitoring Variability analysis

Cited by 18 documents

Krishna, K.S., Sattish, T., Mishra, J. Machine Learning-Based IOT Air Quality and Pollution Detection
 (2023) International Journal on Recent and Innovation Trends in Computing and Communication

Siva Krishna, K., Sattish, T., Mishra, J. Machine Learning-Based IOT Air Quality and Pollution Detection
 (2023) International Journal on Recent and Innovation Trends in Computing and Communication

Li, L., Song, M., Zhou, J. Ambient particulate matter exposure causes visual dysfunction and retinal neuronal degeneration
 (2022) Ecotoxicology and Environmental Safety

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Related documents

Honourable Director Dr. Ketan Kotecha and professor Dr. Sharnil Pandya published their research titled "Pollution Weather Prediction System: Smart outdoor pollution monitoring and prediction for healthy breathing and living" to Sensors (Switzerland) in September 2020. The study was licensed by MDPI AG.

Dr. Preeti Mulay contributed in yet another exciting study in the vast field of Machine Learning as her study "Bibliometric Survey of Quantum Machine Learning" got published in Science and Technology Libraries by Routledge publishers. The study details how QML has grown into a core research field with new algorithms and their uses being developed almost everyday.

Document details - Bibliometric Survey of Quantum Machine Learning

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Science and Technology Libraries
 Volume 39, Issue 4, 2020, Pages 369-382

Bibliometric Survey of Quantum Machine Learning(Article)

Pande, M., Mulay, P. &
 *Symbiosis Center for Information Technology, Symbiosis International University, Pune, India
 †Computer Science Department, Symbiosis Institute of Technology, Symbiosis International University, Pune, India

Abstract

Quantum Machine Learning (QML) is one of the core research fields in the larger paradigm of Quantum Computing (also known alternatively as Quantum Information). In recent years, researchers have taken deep interest in QML given the potential time and cost advantages that solutions to real-life problems using QML algorithms provide, in comparison to their classical (or digital) machine learning equivalents. This is still a very new and exciting area of research with new algorithms and their uses being developed almost every other day. Deep research interest in this area has picked up only in the past 5–6 years. Given the background, this paper focuses on studying Scopus and Web of Science databases for the past 6 years (2014–2019) to identify various publication trends in the areas of Quantum Machine Learning. The authors have done an in-depth study of the Scopus and Web of Science publication data pertaining to this area and have come up with interesting insights. The survey covers 276 publications in Scopus and 154 publications in Web of Science. From the Scopus database, it is found that there has been a consistent growth in the number of publications in this period. Four research areas, namely, Physics, Astronomy, Computer Science, and Mathematics, have contributed 68.1% of the research publications. The USA leads the top 10 countries with nearly half (49.2%) of the research publications. A total of 148 patents have been published with 94 of these being published in the last four years (2016–2019). This essentially translates to one patent for every two publications. The Web of Science database, though bringing out 154 publications in the period, shows similar trends across the metrics. We have carried out a comparative study of some of the metrics in Scopus and Web of Science databases. Overall the study identifies the top 10 Institutions, authors, and research journals. © 2020 The Author(s). Published with license by Taylor & Francis Group, LLC.

Author keywords
 classical-quantum hybrid algorithms Quantum computing quantum deep learning quantum machine learning

Cited by 8 documents

Seskir, Z.C., Willoughby, K.W. Global Innovation and competition in quantum technology, viewed through the lens of patents and artificial intelligence
 (2023) International Journal of Intellectual Property Management

Du, S., Ding, W., Yang, D. Research on machine learning strategy based on voting model
 (2022) Proceedings of SPIE - The International Society for Optical Engineering

Yang, L., Zhang, L., Fan, Y. Research on BP neural network model based on feature engineering
 (2022) Proceedings of SPIE - The International Society for Optical Engineering

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STUDENT'S ACHIEVEMENTS

Our students Siddhi Joshi, Prachi Mohite and Pritesh Deshmukh from CS 2019-22 Batch participated in virtual mode in an international hackathon named Design Hackathon Competition hosted by the Engineering Department of Queensland University, Australia in October 2020. The challenge was to design an 'open source', low-cost, simple, easy to use and easy to build ventilator that can serve COVID-19 patients in an emergency disaster-relief context.

Our students also leave no stone unturned when it comes to extra-curricular activities. Sahil Gupta from IT 2020-24 Batch participated in the North India Zone Karate Championship held in Dehradun, Uttarakhand in November 2020.

Sahil Gupta also participated in the Jammu & Kashmir State Karate Championships held in Jammu University, Jammu in December 2020. He placed 3rd in the competition and won the Bronze medal. Heartiest Congratulations and All the Best for your future endeavors!





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