MULTIDISCIPLINARY INTERNATIONAL E-CONFERENCE ON

INNOVATIVE TECHNOLOGIES TO ACHIEVE SUSTAINABLE DEVELOPMENT GOALS (SDGS)

2024

OCTOBER 9 - 10, 2024

Organized by

Maharshi University of Information Technology, Lucknow

MAHARISHI UNIVERSITY

In Association With

Indian Youth Nuclear Society

Impact91

RAD Scientific Geeks

E-SOUVENIR

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MESSAGES AND PLENARY TALK

आनंदीबेन पटेल
राज्यपाल, उत्तर प्रदेश

संदेश

मुझे यह जानकर अत्यंत प्रसन्नता हुई कि महर्षि यूनिवर्सिटी ऑफ इन्फार्मेशन टेक्नोलॉजी, लखनऊ द्वारा दो दिवसीय अंतर्राष्ट्रीय कान्फ्रेंस "इनोवेटिव टेक्नोलॉजीज़ टू अचीव सस्टेनेबल डेवलपमेंट गोल्स (SDGs) 2024" का आयोजन किया जा रहा है।

सतत् विकास लक्ष्य पूरी दुनिया से गरीबी समाप्त करने सामाजिक न्याय और पूर्ण समानता जैसे गंभीर उद्देश्यों की पूर्ति के लिए निर्धारित किए गए थे। भारत भी इन लक्ष्यों की पूर्ति में समग्रता से भागीदार रहा है। मुझे विश्वास है कि सम्मेलन में सतत् विकास लक्ष्यों की प्राप्ति के लिए नवीनतम तकनीकों और विचारों का आदान–प्रदान होगा जिससे कई नए सार्थक प्रयासों का उन्मेष होगा।

मैं सम्मेलन के सफल आयोजन हेतु अपनी शुभकामनाएं प्रेषित करती हूँ।

(आनंदीबेन पटेल)

MAHARSHI UNIVERSITY OF INFORMATION TECHNOLOGY, LUCKNOW

MESSAGE

Jai Gurudev!

I am very delighted to be a part of this International E-Conference on Innovative Technologies to achieve Sustainable Development Goals organized by IIT Bombay - NMEICT, MoE, Govt. of India.

Innovation has emerged as an essential driver and is important in advancing sustainable and inclusive development across the globe. Innovation is an important tool for supporting the transformation of productive structures; the rational use of natural resources; and the delivery of health care, food, education, energy, and transport. It is therefore crucial that innovation, science and technology initiatives address all aspects of sustainable development —economic, social and environmental —and their interrelationships, since technological choices can have negative impacts on the social and environmental dimensions of sustainable development. It is equally important that knowledge systems be constructed broadly to include the cultural, social and institutional dimensions in which they operate. The role of government in building science, technology and innovation capabilities is fundamental, including in stimulating the development of systems that will foster the acquisition, development and dissemination of knowledge at the national level. This includes the promotion of education, research, development and technological dissemination, as well as the design and implementation of nationally appropriate industrial policies.

The Sustainable Development Goals (SDGs) are the blueprint to achieve a better and more sustainable future for all. Sustainable development means "meeting the needs of the present without compromising the ability of future generations to meet their own needs." Thus, sustainability aims to protect both natural resources and human health while using our available resources efficiently. They address the global challenges we face, including those related to poverty, inequality, climate change, environmental degradation, peace and justice. Thus, achieving a sustainable future will require innovation of new energy sources, materials, and infrastructure, as well as changes in how we produce food, travel, and build homes.

The Sustainable Development Goals are a call for action by all countries – poor, rich and middle-income – to promote prosperity while protecting the planet. They recognize that ending poverty must go hand-in- hand with strategies that build economic growth and address a range of social needs including education, health, social protection, and job opportunities, while tackling climate change and environmental protection.

The goal of sustainability is to ensure that human activities do not undermine the capacity of ecosystems to meet people's needs, now and in the future. That's why we need new technologies and scientific knowledge to help us achieve our goals for sustainable development.

With these words, I thank you so much all for taking part in this International E-Conference on Innovative Technologies to achieve Sustainable Development Goals. I also congratulate the organizing team and wish them success of the conference.

Jai Gurudev!!

Regards
Prof. (Dr.) Bhanu Pratap Singh
Vice-Chancellor, MUIT

Prof. S. P. Shahi

Vice-Chancellor

☎ +91 9431012332

Ref. No. ....

Date .07.|10|2024

MESSAGE

I am delighted to extend my warm greetings and best wishes to the organizers & participants of "Multidisciplinary INTERNATIONAL (SDGs) E-CONFERENCE on Innovative Technologies to Achieve Sustainable Development Goals (SDGs) 2024" which encompasses a wide range of important sessions on September 09th & 10th, 2024 at Maharshi University of Information Technology, Lucknow.

I sincerely hope that by bringing together the scholars, researchers, and academicians from diverse fields, this Conference will offer new insights into the different ways of technology in which societies express themselves.

I wish the Conference every success looking forward to its positive as well as long- lasting impact on the academia and beyond.

(S.P. Shahi)
Vice-Chancellor

RAD SCIENTIFIC GEEKS

MESSAGE

On behalf of the Organising Committee, I am glad to see the responses from eminent scientists, academicians, young researchers, business delegates and students from all over the world to be a part of SDGs – 2024. Which is held to take place in both Online and in Person at Maharshi Technical University Lucknow , on Oct 9th and 10th 2024.

2024 is a specially designed conference with a theme "Multidisciplinary INTERNATIONAL (SDGs)E-CONFERENCE on Innovative Technologies to Achieve Sustainable Development Goals (SDGs) 2024" which encompasses a wide range of important sessions. It would lay a platform for the interaction between experts around the world and aims to shares an insight into the recent research and cutting-edge technologies, which gains immense interest with the presence
of young and brilliant researchers, business delegates and talented student communities.

We're looking forward to meeting with great minds from different countries around the world and sharing new and path - breaking results and discussion. I'm pretty sure - this conference will be stimulating and productive. Personally, I hope that you will very much enjoy it and reap the benefits of such an engaging event.

Regards
Dr. Dharmendra Kumar
Director, RAD

INDIAN YOUTH NUCLEAR SOCIETY

MESSAGE

It is a great privilege to welcome you to the MULTIDISCIPLINARY INTERNATIONAL E-CONFERENCE on Innovative Technologies to Achieve Sustainable Development Goals (SDGs) 2024. In today's world, the need for innovative, multidisciplinary approaches to address global challenges is more urgent than ever. This conference brings together experts from diverse fields to explore how cutting-edge technologies can contribute to the realization of the United Nations' Sustainable Development Goals.

The importance of this gathering cannot be overstated. As we face unprecedented challenges—ranging from climate change and clean energy to public health and sustainable resource management—it is crucial to foster collaboration across disciplines and geographies. This conference will serve as a platform for sharing ideas, advancing knowledge, and identifying practical solutions that can be implemented to meet the SDGs.

By bringing together specialists from various domains, we aim to inspire new perspectives and spark cross-disciplinary collaborations that can lead to groundbreaking innovations. We expect the discussions and presentations to generate actionable solutions that can directly contribute to achieving specific SDGs, particularly in the areas of clean energy, healthcare, water management, and sustainable agriculture. The conference will also help strengthen international partnerships, enabling the exchange of best practices and the scaling of successful initiatives to a global level.

I am confident that this conference will pave the way for the development of transformative technologies that not only enhance sustainability but also improve the quality of life for future generations.

Thank you for your commitment to making the world a better place through innovation and collaboration.

Regards
Dr. Nitendra Singh
President, IYNS

IMPACT91

MESSAGE

Dear Participants,

On behalf of Impact91, we extend our heartfelt appreciation to all who joined the International E-Conference on Multidisciplinary Innovation Technologies and Sustainable Development Goals 2024.

Your active participation, insights, and dedication to advancing innovative solutions for sustainable development have made this event a resounding success. We believe that collective efforts like these will play a crucial role in driving progress toward achieving the Sustainable Development Goals.

Impact91 remains committed to supporting initiatives that promote technological innovation, collaboration, and sustainable growth. We look forward to furthering our mission together and hope to see you in future engagements that continue to shape a better and more sustainable world.

Thank you for being part of this journey.

With Warm Regards,
Aashraya Seth
President, Impact91

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DEPLOYING REAL-TIME SENTIMENT ANALYSIS ON TWITTER DATA

Ritushree Narayan
Magadh University, Bodh Gaya, Bihar
Email: ritu.702004@gmail.com
Pintu samanta
Mathematics Department, Magadh University, Bodh Gaya, Bihar
Email: pintu.math28@gmail.com

ABSTRACT

This research aims to investigate the application of real-time Sentiment Analysis on Twitter data obtained through the Twitter API. Sentiment analysis, a rapidly evolving field in natural language processing, acts as a mechanism to understand an individual's sentiments, thoughts, or emotions regarding a product, service, movie, etc. This can be accomplished by examining comments and evaluations posted on blogs, social media10 platforms, and other sources that are comparable.

Diverse social media platforms, such as Facebook and Twitter, empower individuals to share their viewpoints. Twitter, specifically, has emerged as the primary channel for real-time information exchange through concise messages called tweets. These tweets reflect user sentiments on a range of topics, trends, or issues. Initial extraction of these real-time tweets involves the use of application programming interfaces (APIs) and incorporates hashtags and keywords. Notably, political personalities such as Donald Trump and Narendra Modi receive a lot of attention. After extraction, polarity and subjectivity are used to classify tweets.

To precisely determine whether these tweets convey a negative or non-negative (positive or neutral) sentiment, machine learning algorithms like Naïve Bayes and Random Forest Classifier are employed. This research provides insightful information on how the public views these statistics. Results from experiments show that real-time data processing is feasible and allows for continuous information retrieval. However, classification accuracies may vary due to the dynamic nature of real-time data collection.

KEYWORDS: Sentiment analysis, NLP, Tokenization, API key, Tweets.

USE OF ETHICAL AI IN CREATIVE INDUSTRIES: COPYRIGHT CONSIDERATIONS

Sreesh Gaur

KIET Group of Institutions, Ghaziabad, Uttar Pradesh

Email: sreesh.gaur@kiet.edu

Lalit Johari

IFTM University, Moradabad, Uttar Pradesh

Email: lalit_johri@iftmuniversity.ac.in

ABSTRACT

The sheer adoption of Artificial Intelligence (AI) in the creative industries has brought about new questions of ethics and the law of copyright and intellectual property (IP). With machines now creating art, there are restrictions of copyright and degradation of uniqueness as machines make better art in records time. This paper explores the implications of using AI to generate creative content, highlighting the ambiguity surrounding authorship, ownership, and the potential devaluation of human creativity.

The work also investigates the relationship between AI and different branches of IP law, namely copyright, patent and trade secrets. The authors explain how creations which are generated fully by AI systems have raised issues of novelty, authorship and ownership which have given rise to further legal questions. The paper also aims to set a general overview of global AI-related IP regulations: references to such approaches are made on the basis of examples provided by jurisdictions of the European Union and the United States of America.

Here, the authors build on the details of interpretative modern legal issues pertaining to AI-generated designs, including the questions on authorship and originality, as well as the protection of design rights. The paper also advocates for India's legal system to modernise the existing legal system by passing a new law for AI such as the Designs Act of 2000 to protect human and AI created ideas.

Also, the study looks at the barrier that arises due to the inability of the section 3(k) of Indian patent act 1970 to protect mathematical models and algorithms through the process of patenting. To track down the possible directions of further development concerning the patentability of AI-derived innovations, the authors contrast India's stance with the patterns offered by the European Patent Office and the United States Patent and Trademark Office.

The paper concentrates on the need to come up with the legal frameworks that will address both the innovation and the IP rights. Any frameworks in place must embrace the right use of artificial intelligence in the creative sector enabling the creator and equally maintain ethical use of artificial intelligence while at the same time guarding against rights infringement to creators and foster good compensation models.

Therefore, the incorporation of AI into the creative industries should be regarded as both a privilege and a problem. Policymakers, legal experts, and business partners are able to take certain measures to prevent this evaluation, which stems from the legal and ethical problematics that appear in connection with AI integration, from reducing the richness of human creativity and negating the prospects for using AI to support the creative industry.

Keywords: Ethical AI; Creative; Industries; Copyright; Intellectual Property Rights;

ECOLOGICAL CONCERNS IN THE SELECT FICTIONAL AND NON-FICTIONAL WORKS OF AMITAV GHOSH

Sunil

Kurukshetra University, Kurukshetra, Haryana

Email: sunilmalik277477@gmail.com

ABSTRACT

Amitav Ghosh is one of the prolific writers of India who has captured the true essence of contemporary issues in his fictional and non-fictional works. Most of his works highlight environmental issues. In recent years, literary writers have been intrigued by the hitherto disregarded powerful interacting relationship between humans and nature. This relationship has implications for ecology research and ecocritical reading. Literary writers now focus their writing on key environmental challenges to highlight ecosystem difficulties. One such person is Amitav Ghosh. His novel The Hungry Tide, set in the Sundarbans, which means "beautiful forest" covers more than ten thousand square kilometres, and tells the narrative of the forced evacuation of refugees from Morichjhapi island. The novel's major topics include environmentalism and destabilisation. In this tale, the physical world is represented as an active force that unites the plant, animal, and human life, and one is touched by the other directly or indirectly. In his non-fiction work The Great Derangement (2016), Amitav Ghosh investigates the current generation's incapacity to appreciate the scope of climate change in the fields of literature, history, and politics. The primary thesis of this non-fiction piece is that literature will one day be accused of being involved in the big insanity and of blindly accepting the climatic calamity. This article will look at how Ghosh's fictional and non-fictional work advocates for more imaginative and cultural forms of fiction that articulate resistance to materialism, which threatens to ruin our world. I'll also discuss Ghosh's environmental advocacy in his novels, The Ibis Trilogy and The Hungry Tide. This paper will examine how the Ibis Trilogy is not only an investigation of colonial power's particularly cruel operations preceding the Opium Wars, but also an eco-critical narrative that articulates resistance to the violence of climate change. A study of The Hungry Tide will also reveal how this hybrid literary piece serves as both a historical narrative of the Marichjhapi massacre and a call to preserve our time's ecosystem. As a result, I will look at the issues that climate change presents for postcolonial writers, as well as the developing grid of literary forms that shape the narrative imagination.

Keywords: Ecology, Ecocriticism, Anthropocene, Climate Change, Environmental Degradation.

TYPES AND APPLICATIONS OF MEMBRANES

Aryendra Singh
Amity University, Lucknow, Uttar Pradesh
Usha Shukla
Amity University, Lucknow, Uttar Pradesh
Email: usha.shukla1@gmail.com

ABSTRACT

Membranes are known as the primary physical element for the selective separation of solvents, molecular compounds, and gases via membrane processes, which can be either pressure, thermal or concentration driven-membrane processes. So far, several materials are being proposed for the fabrication of membranes, starting from polymers and inorganic materials, and their combination to generate the next generation of composite membranes. This paper reports the various types of membranes and their applications ingas separation, water treatment, desalination, direction air capture for CO2 separation, separation of liquids, seawater desalination.

KEYWORDS: Membranes; Mixed Matrix Membranes (MMMs); Metal–organic frameworks (MOFs); Applications.

SOL-GEL METHOD: CREATING DIFFERENT NANOSTRUCTURES

Kaushki Khanna
Amity University, Lucknow, Uttar Pradesh
Usha Shukla
Amity University, Lucknow, Uttar Pradesh
Email: usha.shukla1@gmail.com

ABSTRACT

The foundation of sol gel techniques is the idea that substances go from the solution or sol phase to the gel or gelatinous phase. A more chemical (wet chemical method) for creating different nanostructures, particularly metal oxide nanoparticles, is the sol-gel procedure. This process involves dissolving the molecular precursor (often metal alkoxide) in alcohol or water, heating it, and stirring it to cause hydrolysis or alcohol hydrolysis to turn it into gel. The sol-gel process is economical and offers considerable control over the products' chemical composition because of its low reaction temperature. The sol-gel technique has several applications as an intermediary between thin layers of metal oxides and can be utilized as a molding material in ceramic production. Many optical, electronic, energy, surface engineering, biosensor, medicinal, and separation technologies (like chromatography) use materials derived from the sol-gel process. A common and industrial technique for creating nanoparticles with varying chemical compositions is the sol-gel method.

KEYWORDS: sol gel techniques, chemical composition; molecular precursor; low reaction temperature

EARLY EMOTIONAL AND DEEP LEARNING-BASED DEPRESSION DETECTION IN SOCIAL MEDIA

MD Irshad Alam

Department of Computer Science, Patliputra University, Patna, Bihar
Email: mdirshadalam.kir@gmail.com

K. P. Yadav

Department of Physics, College of Commerce, Arts & Science, Patna, Bihar, India

ABSTRACT

Depression is a psychological disorder related to a combination of genetic, biological, environmental and psychological factors. One of the causes of suicide and a common comorbidity with disabilities, depression poses a threat to public health. Many people who deal with depression turn to social media as a resource or a safe space to discuss their struggles. Finding people who may be suffering from depression in these online communities has been the subject of some research. A hurdle to practical use, nonetheless, remains the insufficient efficacy. Therefore, we provide a strategy for early social media depression identification using a convolutional neural network, context-independent word embeddings, and the Early and Late Fusion methods. Taking into account the significance of the underlying emotions conveyed by the emoticons, these methods are tested experimentally. With a precision of comparable or better performance compared to numerous baselines, the findings demonstrate that the suggested technique might identify users who may be suffering from depression. Better results were also achieved by the semantic mapping of emoticons, which led to an increase in recall and a decrease in accuracy. Our semantic mapping of emoticons improved recall by percent and accuracy the percent compared to the baseline word embedding method. When taking into account both the fusion-based methods and individual embeddings, this study enhanced the state- of-the-art in terms of overall efficacy. Important suggestive evidence of the issue and a useful tool for early identification may be found in the emotions exhibited by depressed persons and encoded via emoticons. A number of variables, including heredity, biology, the environment, and mental health, interact to cause depression. Some of the symptoms that people with this disease may experience include fatigue, changes in appetite, worry, trouble concentrating, difficulty making a choice, and low self-esteem, guilt, and despair. The prevalence of depression has been steadily increasing over the years, despite improvements in screening for the disorder and its treatment. As a matter of fact, depression ranks first among all global health issues and disabilities. Recent estimates by the World Health Organisation (WHO) put the global prevalence at around 300 million cases. Between 2005 and 2015, there was an 18.4% rise in the number of cases. Among the over 800,000 people who take their own lives each year, severe depressive disorder is a leading cause. This illness is really serious, and we need to find ways to make it easier to diagnose and slow its spread. Thus, using data created on social media is a viable alternative that complements the original strategy. People were now able to express themselves fully and openly with the rise of social media sites like Reddit, Facebook, and Twitter. Social media posts not only convey meaning in an overt way, but they also reveal a lot about the people who wrote them in an indirect way. According to users might also discover symptoms that suggest the beginning of depression on social media.

QUERY OPTIMIZATION STRATEGIES IN DISTRIBUTED DATABASES

Abhayanand
Department of Computer Science, Patliputra University, Patna, Bihar, India
Email: abhayanandmca@gmail.com
Dr. M. M. Rahman
Department of Mathematics, A. N. College, Patna, Bihar, India

ABSTRACT

There is no easy solution to the query optimisation issue in large-scale distributed databases; it is NP-hard. As the quantity of relations and joins in a query grows, so does the optimizer's complexity. To discover the best answer, particularly as database sizes grow, researchers are trying to identify the right method. This study reviews several optimisation strategies and shows that integrating the Ant Colony Optimisation Algorithm with other algorithms improves the speed of distributed query optimisation. In light of the advent of high-speed communication networks, a lot of effort is going into studying how to efficiently handle complicated queries within a distributed database setting. In order to increase the logical computer's speed, dependability, availability, and modularity, a distributed database is a set of interconnected databases that are dispersed throughout a network. When compared to centralised environments, distributed ones make query processing a lot more of a pain. The processing of queries necessitates the transmission of data across many locations due to the geographical distribution of the data. Distributed Query Processing Getting Data from Multiple Locations (DQP). In order to get a single set of query results, the query processor pulls data from databases spread across several network locations and processes it using numerous CPUs. Executing a Distributed Query involves three distinct steps. Stage of Local Processing: At this point, the first Algebraic Query based on global relations is prepared and made accessible to the relevant sites for data localisation processing, which includes things like local projections and selects. The optimisation of distributed database queries using Ant Colony Optimisation Algorithm hybrids is an emerging area of research. There is ongoing research on developing and using ACO hybrids to address different kinds of optimisation issues. The results demonstrated the efficacy and practicality of ACO hybrids in solving optimisation issues. When the query size and number of joins increase, research shows that these probabilistic algorithms, when implemented, provide viable solutions in both distributed and relational database management systems. Hybrids of ACO for queries in distributed databases still have a lot of room to grow in terms of optimising solutions and refining search techniques, particularly when relation sizes and complexity grow in tandem with the number of factors impacting the query.

KEYWORDS: optimization, Hybrids, environments, query optimisation, Algorithm hybrids, Distributed Query Processing

SOFTWARE & TOOLS FOR MASSIVE BIG DATA PROCESSING & ANALYTICS

Nimisha Manan

Department Of Mathematics. Patliputra University, Patna, Bihar

Email: nimisha.manan@gmail.com

Krishnandan Prasad

Department of Mathematics, T.P, S. College Patna, Bihar

ABSTRACT

The exponential growth of big data has necessitated the development of scalable software and tools to process, analyze, and extract insights from vast volumes of data. This paper presents an overview of prominent software and tools designed to handle massive, big data processing. We discuss the architectures, features, and applications of 1. Distributed Computing Frameworks: Apache Hadoop, Apache Spark, and Apache Flink. 2. NoSQL Databases: MongoDB, Cassandra, and Couchbase. 3. Big Data Analytics Platforms: Apache Hive, Apache Impala, and Google BigQuery. 4. Stream Processing Engines: Apache Kafka, Apache Storm, and Apache Beam. 5. Machine Learning Libraries: TensorFlow, PyTorch, and Scikit-learn. These software and tools enable efficient processing, storage, and analysis of big data, supporting various use cases, such as: Data warehousing and business intelligence Real-time analytics and stream processing- Predictive modeling and machine learning Data integration and governance We evaluate the performance, scalability, and limitations of these software and tools, highlighting their strengths and weaknesses. Our analysis provides valuable insights for researchers, developers, and practitioners seeking to harness the power of big data.

KEYWORDS: Big Data, Distributed Computing, NoSQL Databases, Stream Processing, Machine Learning, Data Analytics.

ATOMIC FORCE MICROSCOPY: A POWERFUL TOOL IN MODERN SCIENCE AND TECHNOLOGY

Darshpreet Singh
Amity University, Lucknow, Uttar Pradesh
Usha Shukla
Amity University, Lucknow, Uttar Pradesh
Email: usha.shukla1@gmail.com

ABSTRACT

Atomic force microscopy (AFM) has revolutionized the field of nanoscale characterization and measurements. Unlike traditional microscopy techniques that are limited by the wavelength of light or require extensive sample preparation, AFM operates by "feeling" the sample surface with a sharp tip, providing high-resolution images down to the atomic scale. AFM is versatile, capable of working in various environments, including liquids, and requires minimal sample preparation, thus maintaining the native state of the samples. Its applications span numerous scientific and technological fields, including nanofabrication, material science, microbiology, mineralogical research, bone-related research, and food science and technology. This paper reviews the principles of AFM, its technological advancements, and its diverse applications, highlighting its significance as a powerful tool in modern science and technology.

KEYWORDS: Atomic force microscopy (AFM); Principle of AFM; Working of AFM; Nanofabrication; Sample surface; Applications.

QUALITY EDUCATION AND LIFE LONG LEARNING

Gouri Gusain

Maharishi University of Information Technology, Noida

Email: gusaingouri1@gmail.com

ABSTRACT

Teachers Lifelong learning is the blend of pedagogy and andragogy. It can be provided through various modes, such as, distance learning, e-learning, continuing education and correspondence courses. The concept of lifelong learning has been undergoing transformations within the course of time. As the name implies, it takes place throughout the lives of the individuals. It is stated to be taking place from cradle to grave. Apart from academic concepts, throughout the lives of the individuals, they are required to generate awareness and augment their skills and abilities in terms of various areas. Lifelong learning is the learning that takes place from integration of formal, non-formal and informal education. The individuals are required to augment their abilities that areneeded to achieve personal and professional goals. Learning is a continuous lifelong process, which initiates from birth and carries on throughout the lives of the individuals. Throughout the lives of the individuals, they acquire knowledge and enrich their competencies from family members, community members, educational institutions, workplaces and so forth. The concept of self-funded learning is linked to the characteristic of self-motivated learning. In recognition of the costs involved in subsidizing lifelong involvement in education. The lifelong learning policy puts emphasis on the responsibility of the individuals to finance their continuing education and training with minimal support from the government. The lifelong learner is the person, who takes the responsibility of their own learning. Within the course of lifelong learning, the individuals are required to bring about improvements in knowledge and skills. The developments and changes that are taking place within the lives of the individuals are major aspects that inspires them to bring about improvements in their knowledge and skills. Experiences and opportunities are regarded as crucial aspects that individuals seek in order tobring about improvements in knowledge and skills. Quality education shouldn't be a new concept because, shouldn't all educational bodies be focused on the needs and development of learners rather than their profiles? Unfortunately, this isn't always the case. Now more than ever, there is a need for quality education to remove biases and offer fair opportunities to all learners. Helping learners will also help communities and societies prosper. Whether pursuing personal interests and passions or chasing professional ambitions, lifelong learning can help us to achieve personal fulfillment and satisfaction. It recognizes that humans have a natural drive to explore, learn and grow and encourages us to improve our own quality of life and sense of self-worth by paying attention to the ideas and goals that inspire us.

KEYWORDS: Awareness, Individuals, Learners, Lifelong Learning, Proficiencies

SUSTAINABLE CITIES AND COMMUNITIES

Lakshmi Rathour

Maharishi University of Information Technology, Noida

Email: lakshmijee2003@gmail.com

ABSTRACT

To ensure inclusive, safe, resilient, and sustainable urban and human settlements, SDG-11, Sustainable Cities and Communities, aims to reduce urban sprawl, increase the involvement of urban governance, improve the protection of cultural assets, and address issues related to climate change and urban resilience. There are currently 1.1 billion people living in urban slums, and 1.5 billion people that number has tripled to 2 billion, live in areas affected by natural disasters. The world's population is still expanding. Building modern, sustainable urban centers is crucial to housing everyone. Developing resilience in urban areas demands a comprehensive and forward-thinking strategy that incorporates diverse elements of city design and administration. Right now, one of the biggest challenges to humanity is global climate change. Developing resilience in urban areas demands a comprehensive and forward-thinking strategy that incorporates diverse elements of city design and administration. The 2030 Climate Target Plan was approved by the EU in December 2020 with the goal of becoming "carbon neutral" by 2050. China declared in September 2020 that it will reach "carbon neutral" status by 2060 and peak CO_2 emissions by 2030. Buildings account for up to 39% of greenhouse gas emissions worldwide and utilize 36% of all end-use energy worldwide. To achieve carbon neutrality, then, one of the best ways to proceed is to create a technology roadmap as well as an implementation plan for the construction industry's low carbon. There are instances of sustainable cities all around the world. Smart cities dedicated to eco-cities that value people and the environment via the use of efficient technologies. One of the top Eco-design and natural and built heritage design and consulting businesses in the world, Arcadis, carried out a study in 2022 to determine which cities are the most sustainable worldwide. It was based on a number of indicators, but they all converged on three fundamental pillars social, environmental, and economic that were closely matched with the UN SDGs. From then, 100 cities came into being, each of them paving the path for green cities in a unique way.

KEYWORDS: Smart Cities, Communities, Climate

GENDER EQUALITY AND EMPOWERMENT THROUGH TECHNOLOGY

Anjali Agrawal

Maharishi University of Information Technology, Noida

Email: anjaliforb@gmail.com

ABSTRACT

Technology plays a critical transformative role in enhancing gender equality and empowering both women and marginalized genders across different industries. The paper relies on analyzing secondary data from academic literature, government reports, and organizations of good repute by revealing the breaking of traditional barriers that were conventional in education, healthcare, and economic sectors with the use of mobile platforms, digital tools, and online access. Despite some remarkable achievements, issues such as the digital divide, the persistence of digital literacy gaps, and how the risks in online safety continue to be a source of considerable concern. Through analytics of existing data and case studies, the paper provides evidence-based recommendations for policymakers, organizations, and stakeholders to harness technology for improvement in gender equality. The findings remain that technology has tremendous potential to be an even more powerful enabler of inclusive development and will indeed be so only if strategic efforts are applied to strengthen efforts over these issues.

KEYWORDS: Gender Equality, Literacy Gaps

MICROBIAL CONSORTIA AS TECHNOLOGICAL INNOVATION TO MANAGE WASTE DUMPSITES IN INDIA

Shivangi Mathur

Department of Botany, School of Sciences and Humanities, Maharishi University of Information Technology, Noida

Email: anjaliforb@gmail.com

ABSTRACT

Waste dumpsites in India are a significant environmental and public health concern. The rapid urbanization and population growth have led to increased waste generation, with many cities struggling to manage their waste effectively. Here are some key points about waste dumpsites in India: A) Volume of Waste: India generates an estimated 150,000 metric tons of solid waste daily, with a significant portion ending up in dumpsites. B) Landfill Conditions: Many dumpsites are poorly managed, lacking proper infrastructure for leachate management. This can lead to soil and water contamination. C) Health Risks: Communities near dumpsites face health risks due to exposure to hazardous materials and poor air quality. Issues such as respiratory problems, skin diseases, and other health complications are common. D)Environmental Impact: Dumpsites contribute to greenhouse gas emissions, particularly methane, a potent contributor to climate change. They also pose risks to local ecosystems. One of the major constituents in Dumpsites is the plastic accumulated over the years. The global plastic production was estimated to be around 400.3 million metric tons in 2022. Approximately, two-third of the global plastic produced ends up in waste in less than a month (Huang et al. 2022) . Plastic waste imposes a significant environmental burden due to its resistance to degradation, taking nearly 500 years to decompose depending on its composition. Disposal practices contribute to the accelerated accumulation of plastic waste in natural ecosystems (Andrady and Neal 2009) . Plastic waste generation is projected to triple by 2060 if changes are not made in the current policies (Lebreton and Andrady 2019). Conventional methods like incineration release toxic pollutants in the environment. Exposure of humans to these toxic by-products causes issues with lung function, respiratory symptoms and an elevated risk of developing cancer (Huang et al. 2022). Only 9% of the plastic waste is recycled worldwide (Liu et al. 2022). The rest of the plastic waste is mismanaged, which is illegally dumped or burned in open pits, or ends up in river and oceans.

These dumpsites and their major accumulated waste material can be managed by technological advancements like designing microbial Consortia which is a step forward toward sustainable development. A microbial consortium designed for dumpsites consists of a carefully selected group of microorganisms that work together to enhance the degradation of organic waste, reduce harmful pollutants, and promote environmental restoration. These microbial consortia can be designed according to the Composition of a Dumpsites because Dumpsites across India may vary in their composition. Various microbial consortia have already been developed for the degradation of plastic and other waste material present at the dumpsites. Polyethylene Degrading Consortium Consists of Pseudomonas, Mycobacterium, and Bacillus species, Polystyrene Degrading Consortium Includes strains of Nocardia, Pseudomonas, and Bacillus and Biodegradation of Polyvinyl Chloride (PVC) includes Bacillus and Pseudomonas species, along with certain fungi like Aspergillus are some of the examples of microbial consortium used for managing plastic waste degradation.

Microbial consortia tailored for dumpsites hold great promise for enhancing waste degradation, mitigating environmental impacts, and promoting sustainability. By leveraging the natural capabilities of microorganisms, these approaches can contribute to more effective waste management strategies in urban settings.

DECENTRALIZED GOVERNANCE AND INTERMEDIATE TECHNOLOGY: PATHWAYS TO SUSTAINABLE DEVELOPMENT AND JUSTICE

Vijay Srivastava

Department of Humanities, Maharishi School of Science & Humanities, MUIT, Lucknow, Uttar Pradesh
Email: vijay.srivastava@muit.in

ABSTRACT

Achieving good governance goals of sustainable development, peace, and justice requires a decentralized approach that empowers local communities and integrates intermediate technologies. The Panchayat Raj system, as envisioned by thinkers like Vinoba Bhave and Jai Prakash Narayan, offers a model for decentralized governance where local decision-making is emphasized, fostering sustainable development rooted in community values. Bhave's concept of Gram Swaraj emphasizes village self-reliance, with local production, education, and justice systems, underscoring that true independence comes from decentralization, not central control.

Intermediate technologies, which are small-scale, locally adaptable, and environmentally sustainable, play a crucial role in this decentralized framework. By relying on technologies that villages can manage and maintain, local economies can thrive without relying on large-scale industrialization that often leads to environmental degradation. This resonates with the Economy of Permanence, which calls for economic practices that ensure long-term sustainability, balancing development with ecological conservation.

A Panchayat-centred governance model also aligns with several Sustainable Development Goals (SDGs), particularly SDG 16 (Peace, Justice, and Strong Institutions) and SDG 11 (Sustainable Cities and Communities), as it encourages participatory decision-making and equitable resource distribution. The principles of village-level democracy not only promote sustainable livelihoods but also foster social harmony, reducing conflicts rooted in inequality and injustice. Thus, decentralization, when combined with intermediate technologies, can significantly contribute to achieving a just and sustainable world order.

KEYWORDS: Intermediate Technology, Economy of Permanence, Decentralization, Panchayat Raj, Sustainable Development Goals (SDGs)

AN APPROACH FOR SEMANTIC-SYNAPTIC WEB ENTROPY : A SURVEY

Chandan Kumar

Department of Computer Science, Patliputra University, Patna, Bihar

Email: chandannbt89@gmail.com

ABSTRACT

Web mining is the process of combining data obtained via the Internet with data obtained through more conventional data mining processes and techniques. Use it to learn about consumer habits, assess the performance of a website, and put a number on the ROI of an advertising campaign. Data patterns may be discovered by content mining, structure mining, and use mining, all of which are made possible by it. Search engine and web crawler data is analysed using content mining. In order to improve website design by observing user or customer behaviour and making additional topic or recommendation based on that data, web usage mining is applied to many real-world problems. Structure mining is used to examine data related to a particular website's structure. With the goal of better understanding and meeting the demands of web-based applications, Web use Mining applies data mining methods to uncover intriguing use patterns from web data. Usage data records not just how visitors use a website, but also their location and other identifying information. Web use mining may be further segmented based on the kind of usage data that is taken into account. These include information pertaining to web servers, application servers, and applications themselves. Information gathered from web servers is consistent with user logs. The current study relies on data typically gathered at web servers, such as IP addresses, page references, and users' access times. Web use mining, and more specifically, extracting website traffic patterns from server log files, is the primary emphasis of this study. Web Usage Mining is the practice of discovering and analysing user access patterns via the mining of log files and related data linked with a certain website. A subset of web mining, it aids in the investigation and analysis of user interests by automatically discovering patterns of user behaviour. Data preparation, pattern finding, and pattern analysis are the three primary steps in web use mining.

KEYWORDS: Web Usage Mining, Usage data, Data patterns, certain website, Synaptic Web Entropy

ANALYSING THE VAST MAJORITY OF AVAILABLE LITERATURE OF ENHANCING OF OPERATING SYSTEM THROUGH MACHINE LEARNING

Praveen Kumar Mishra

Department of Mathematics, Patliputra University, Patna, Bihar

Email: praveen1378@gmail.com

Manish Kumar

Department of Mathematics, Patliputra University, Patna, Bihar

Email: mkmath5@gmail.com

ABSTRACT

In this survey, we review prominent studies that employ machine learning or deep learning approaches for ransomware detection, chosen based on the number of citations they received. We conducted experiments to assess how these studies are affected by the evolution of ransomware and explored potential future directions, including ransomware's expected expansion into IoT environments as these technologies become more integrated into homes and infrastructures

This survey reviews research on using machine learning and deep learning to detect ransomware. The motivation behind this study is the destructive nature of ransomware, the difficulty of reversing an infection, and the need for early detection. As machine learning becomes a vital tool in combating ransomware, we aimed to identify the weaknesses in current methods and find ways to improve them.

Ransomware remains a major threat, with new versions constantly emerging, and recovery is difficult due to their strong encryption. The rise of artificial intelligence has made it even more important to explore how machine learning can help detect new, unknown ransomware threats. These techniques allow us to create predictive models that learn ransomware behaviors, making it possible to identify previously unseen variants.

In our survey, we review influential research studies that use machine learning or deep learning for ransomware detection, chosen based on their citation numbers. We also conducted experiments to evaluate the impact of ransomware evolution on these studies and explored future trends, including the likely spread of ransomware into the Internet of Things (IoT) as more devices become part of our daily lives and infrastructure.

KEYWORDS: Machine Learning, Artificial Intelligence, IoT