

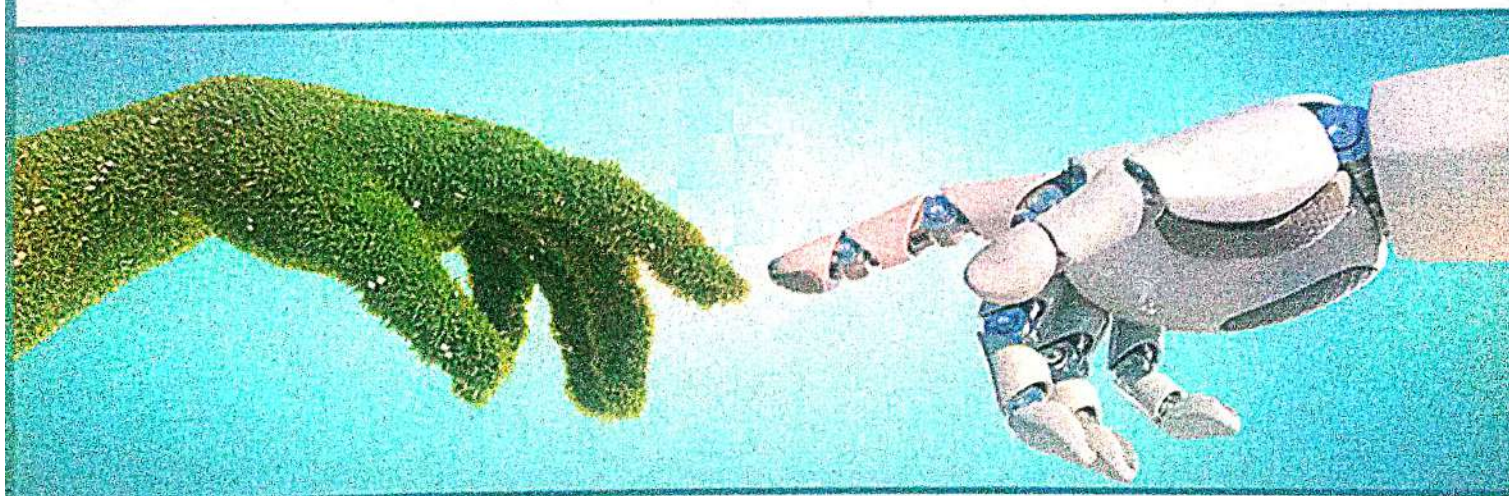


Y.A. GOVT. COLLEGE FOR WOMEN

CHIRALA, BAPATLA (DT.), A.P.

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A book on the occasion of
NATIONAL SCIENCE DAY



AI AND ENVIRONMENT

ISBN : 978-93-5759-293-2

Dept. of Chemistry, YAGCW, Chirala.

February-2026

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February -2026

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AI role in institutional Administration

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Introduction

Administration is the backbone of any college. Without strong systems, even the best academic programs suffer. Unfortunately, many institutions still depend on outdated manual systems. This leads to long admission processing times. Inefficient communication between departments. Scheduling conflicts for classes and exams. Limited data insights for decision-making. By adopting AI in college administration, institutions solve these issues. Artificial intelligence provides automation, predictive analytics, and real-time support. The result is reduced workload for staff, more accuracy in tasks, and improved student experiences.

Automating Administrative Tasks with AI

One of the most valuable applications of AI in college administration is automation. Tasks that once required hours of human effort are now completed within minutes.

The following automating administrative tasks made easy and simplify the process:

Admissions processing: AI quickly scans applications, checks eligibility, and ranks candidates.

Grading support: Automated systems evaluate multiple-choice tests and even assess written answers.

Document management: AI tools classify, organize, and retrieve records without manual searching.

Communication: Chatbots answer student queries instantly, reducing staff workload.

This automation allows colleges to operate with fewer errors and faster turnaround times. Staff members can then dedicate their energy to strategic planning instead of repetitive work.

AI Tools for Education Management

Institutes are increasingly adopting AI tools for education management to keep up with student demands. These tools help with:

Smart Scheduling:

AI ensures there are no clashes between class schedules, faculty availability, or room capacity.

AI-Powered Student Management:

Platforms track student progress, attendance, and overall performance. Alerts are sent if a student shows declining results.

Resource Allocation:

Artificial intelligence helps distribute resources like labs, books, or faculty time efficiently.

Financial Administration:

AI assists in fee collection reminders, scholarship management, and financial reporting.

AI in Higher Education

A Shift in Operations: The adoption of AI in higher education is more than just adding software. It is about changing the culture of administration. Colleges that integrate AI see:

Better decision-making with predictive analytics.

Efficient workflows where multiple departments collaborate seamlessly.

Data-driven strategies to improve admissions and student success.

AI for Admissions and Records

Admissions and student records management are critical yet time-consuming tasks. AI for admissions and records transforms this process:

Application Sorting: AI scans thousands of applications, highlighting top candidates.

Fraud Detection: Algorithms identify suspicious or fake documents.

Student Records: AI keeps accurate digital profiles updated automatically.

Data Security: AI strengthens protection of sensitive information.

For colleges, this means admissions become faster and more transparent. Students also experience a smoother application journey.

Smart Scheduling with AI

Scheduling is one of the biggest administrative challenges in higher education. Faculty availability, classroom space, student preferences, and exam timetables all need alignment. Smart scheduling with AI ensures this happens seamlessly.

Benefits include: Automatic conflict detection and resolution. Personalized timetables for students. Flexible adjustments when emergencies occur. Efficient use of space and faculty resources. This reduces frustration among staff and students, ensuring course delivery runs smoothly.

AI-Powered Student Management

Beyond administration, colleges use AI-powered student management systems to support learners throughout their academic journey. These systems track attendance automatically through facial recognition. Monitor performance trends across semesters. Suggest learning resources tailored to each student. Provide early warnings when students need academic support. This proactive support ensures higher student success and retention rates. It also reduces the burden on faculty advisors.

Benefits of Streamlining Operations with AI

The advantages of streamlining operations with AI go beyond efficiency. Colleges see improvements in:

Student Experience: Faster services and more personalized interactions.

Staff Productivity: Less time spent on routine paperwork.

Cost Savings: Reduced administrative overhead.

Data Insights: Real-time dashboards that guide decision-making.

By embracing AI, colleges position themselves as modern institutions ready for future demands.

Challenges in AI for Colleges and Universities

While AI for colleges and universities brings many benefits, challenges remain:

High costs of initial setup and training.

Data privacy concerns with sensitive student records.

Resistance to change among staff.

Need for skilled professionals to manage AI tools.

To overcome these, colleges must plan carefully. They should invest in training, adopt secure platforms, and involve staff in the transition.

Future of AI in Academic Administration

The future of AI in academic administration looks promising. Trends shaping the coming years include:

Voice assistants for quick information access.

AI-driven chatbots handling admissions queries.

Blockchain integration for secure student records.

Advanced analytics predicting future education trends.

Institutions that adopt these technologies early will stay ahead in delivering quality education and efficient services.

External Resource Suggestion

For further insights, explore Educause's research on AI in Higher Education, which discusses emerging technologies shaping universities globally.

Key Administrative Roles of AI in Higher Education

Admissions and Enrolment: AI tools accelerate application processing, screen candidates based on predefined criteria, and manage enrolment data efficiently.

Student Support and Communication: 24/7 AI-powered chatbots and virtual assistants handle routine inquiries regarding admissions, financial aid, or campus life, reducing staff workload.

Scheduling and Resource Allocation: AI optimizes complex scheduling for classes, faculty, and room capacity, eliminating clashes and improving resource distribution.

Operational Efficiency: AI automates manual tasks like attendance tracking, data entry, and record management, saving hundreds of hours annually.

Predictive Analytics for Retention: AI analyses student data to identify at-risk individuals, allowing for timely, personalized interventions.

Financial and Records Management: AI streamlines financial aid processes and manages student records, including archiving and compliance.

By taking over repetitive tasks, AI allows administrative staff to focus on high-value, human-centric interactions.

Conclusion

The integration of AI in college administration is no longer optional it's essential. From admissions to smart scheduling, AI simplifies complex tasks, improves accuracy, and enhances student experiences. Colleges that embrace these changes will not only improve efficiency but also strengthen their reputation as forward-thinking institutions. The future of administration is smart, data-driven, and powered by artificial intelligence. AI in college administration streamlines operations by automating routine tasks, improving efficiency, and freeing staff for strategic work. Key applications include 24/7 chatbots for student inquiries, intelligent scheduling, automated application screening, and predictive analytics for student retention. AI also assists with HR, financial aid processing,

Source:

<https://www.iipa.org.in/GyanKOSH/posts/application-of-ai-in-governance>

From Useful to Harmful: The Plastic Paradox in the Context Of Sustainable Development

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Introduction

Now a days plastic has become an essential material in modern era due to its durability, affordability, and versatility. Plastic has tremendously contributed to the industrial growth, healthcare advancement, and consumer comfortness. But the huge increase of plastic production and consumption has led to severe environmental degradation, marine pollution and emerging public health concerns. So this conflicting nature of plastic — as both a developmental asset and an ecological threat — is termed the “Plastic Paradox.” This paper examines the dual role of plastic, analyzes its environmental and socio-economic implications, and suggests sustainable policy interventions within the framework of circular economy principles.

In the early 20th Century synthetic polymers were introduced which revolutionized manufacturing and Global trade. Plastics quickly substituted traditional materials such as wood, glass and metal in multiple industries because of its lightweight nature, low production cost, and resistance to corrosion. From agriculture to healthcare, plastic has become deeply embedded in everyday life. But the exponential growth in plastic production has given birth to a parallel increase in plastic waste. The features that make plastic durable and efficient also make it resistant to natural decomposition. This challenge forms the essence of the Plastic Paradox — a material that enhances human development while simultaneously threatening environmental sustainability.

Plastic as a Developmental Enabler

Plastic has played a major role in economic and social advancement as follows:

Industrial and Economic Contribution

The plastic manufacturing industry contributes significantly to employment generation and industrial output. Since it is affordable it

supports mass production and consumption, making goods accessible to wider populations.

Health care Advancements

Modern medical sector depends mainly on plastic products such as syringes, IV tubes, blood storage bags, surgical gloves, and Personal Protective Equipment (PPE). These products guarantee hygiene, reduce infection risks, and improve patient safety.

Packaging and Food Security

Packing food materials with plastic extends the shelf life of food products, reduces transportation costs, and minimizes food wastage. Due to its lightweight nature plastic reduces fuel consumption during transportation. As such plastic has undoubtedly improved living standards and economic efficiency.

Though plastic has shown tremendous benefits still it has become one of the most pressing environmental challenges of the 21st century.

Non-Biodegradability

It takes hundreds of years for the plastic to get decomposed. As a result, they get accumulated in landfills and spoil the natural ecosystems which are a serious disaster to the economy.

Marine and Terrestrial Pollution

Every year huge quantities of plastic waste enter oceans, endangering marine species and disturbing the aquatic ecosystems. On the other hand plastic blocks the drainage systems and results to urban flooding.

Microplastics and Health Risks

With the passage of time, plastic breaks down into microplastics, which contaminates the soil, water and food chains. Recent survey explains the presence of microplastics in drinking water and even human tissues, causing serious health concerns.

Climate Change Implications

Production of plastic depends largely on fossil fuels. The production process namely the extraction, manufacturing and disposal of plastic releases greenhouse gases, thereby affecting the global warming.

The above impacts demonstrate that plastic misuse has transformed a beneficial innovation into a Global environmental crisis. Plastics are not inherently harmful—rather they are unsustainable in production, consumption, and disposal practices intensify its negative consequences.

Policy Measures and Sustainable Solutions

Addressing the Plastic Paradox needs a multi-dimensional approach namely reduction of single-use plastics, promote alternatives for reusable and biodegradable plastics, strengthening recycling infrastructure. Adoption of circular economy models should be implemented which emphasizes reuse and resource recovery. Government regulations, corporate accountability, and consumer responsibility should go hand in hand to create sustainable outcomes.

Conclusion

In the Modern civilization plastic represents one of the greatest technological achievements, yet it also symbolizes a major environmental dispute. The Plastic Paradox highlights the need for balanced development—where innovation is associated with ecological responsibility. The solution does not lie in eliminating plastic entirely but in converting production systems, consumption patterns, and waste management strategies. Sustainable Governance and responsible citizenship are important to convert plastic from a harmful pollutant back into a valuable resource.

References:

1. <https://www.undp.org/chemicals-waste/plastic-pollution>.
2. <https://link.springer.com/article/10.1007/s43621-025-02218-1>
3. United Nations Environment Programme (2023). Turning off the tap: How the world can end plastic pollution and create a circular economy. UNEP.
4. Organisation for Economic Co-operation and Development (2022). Global plastics outlook.

Environmental Governance and Democratic Accountability

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Introduction

Environmental governance has emerged as a crucial field in contemporary political discourse, specially in the context of climate change, biodiversity loss, and sustainable development. Democratic accountability ensures that environmental policies are transparent, participatory, and responsive to citizens' needs. This paper explores the conceptual foundations of environmental governance, the mechanisms of democratic accountability, and the challenges faced in aligning environmental decision-making with democratic principles. It argues that strengthening participatory institutions, transparency mechanisms, and legal frameworks is essential for achieving sustainable and equitable environmental outcomes. Environmental issues have become central to global political debates. From climate change to deforestation and pollution, governments are increasingly required to balance economic growth with environmental protection. Environmental governance refers to the structures, policies, and processes through which societies manage environmental resources and challenges. Democratic accountability ensures that decision-makers are answerable to the public. In environmental governance, accountability is vital because environmental decisions often have long-term consequences affecting future generations.

Conceptual Framework

Environmental governance includes local, national, and global institutions that regulate environmental policies. It encompasses governmental agencies, civil society organizations, international institutions, and private actors. Democratic accountability ensures that public officials justify their decisions and are subject to sanctions if they fail to act in the public interest. Mechanisms include electoral accountability, legislative oversight, judicial review, media scrutiny, and civil society activism.

Theoretical Perspectives

Liberal democratic theory emphasizes institutional checks and balances. Participatory democracy stresses citizen involvement in environmental decision-making. Deliberative democracy encourages reasoned debate among stakeholders to ensure inclusive and legitimate environmental policies.

Environmental Governance at Different Levels

At the global level, environmental governance addresses transboundary issues like climate change. At the national level, governments implement environmental laws, regulations, and policies through parliamentary oversight and judicial review. At the local level, decentralized institutions and community participation enhance grassroots environmental accountability.

Key Challenges to Democratic Accountability

Challenges include technocratic decision-making, corporate influence, information asymmetry, weak enforcement of international agreements, and climate justice concerns where marginalized communities bear disproportionate environmental burdens.

Strengthening Environmental Governance

Strengthening transparency
promoting public participation
enhancing legal and institutional reforms
adopting digital governance tools

Conclusion

Environmental governance and democratic accountability are mutually reinforcing. Sustainable environmental policies require transparent institutions, active citizen participation, and robust legal frameworks. Strengthening grassroots participation and judicial oversight is essential for achieving environmental justice and sustainable development.

References

1. United Nations Environment Programme (UNEP) Reports.
2. Paris Agreement (2015)
3. Scholarly works on Environmental Politics and Governance
4. Reports on National Green Tribunal (India)
5. Academic journals on democratic accountability and sustainability

isbn 978-93-5759-293-2

A Symbiotic Future of Artificial Intelligence and the Environment

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Introduction

Artificial Intelligence (AI) is rapidly transforming industries and society, but its environmental implications are receiving growing attention. This article explores the dual role AI plays in both contributing to environmental challenges and offering innovative solutions for sustainability. We examine AI's energy demands, carbon footprint, and resource use alongside its potential to optimize resource management, advance climate modeling, and enhance conservation efforts.

AI technologies, from machine learning to robotics, are becoming ubiquitous. However, their development and deployment consume substantial energy, prompting concerns about their sustainability. Conversely, AI offers powerful tools to tackle environmental issues from predicting climate change impacts to optimizing renewable energy systems.

The Environmental Costs of AI

Energy Consumption and Carbon Emissions

Training large-scale AI models demands intensive computation, often relying on data centers powered by fossil fuels. Studies estimate that training a single state-of-the-art natural language processing model can emit as much carbon as five cars over their lifetime. This highlights the urgent need for energy-efficient algorithms and greener data center practices.

Resource Utilization

Besides energy, AI hardware depends on rare earth metals and other finite resources. The lifecycle impact, including mining, manufacturing, and e-waste, must be carefully managed to minimize ecological harm.

AI as a Catalyst for Sustainability

AI enhances climate science by processing vast datasets, detecting complex patterns, and improving the accuracy of climate models. This enables better understanding and forecasting of environmental changes, aiding policymakers in crafting effective responses.

Climate Modeling and Prediction

Renewable Energy Optimization

Machine learning algorithms optimize the integration and operation of intermittent renewable sources like solar and wind by predicting supply and demand fluctuations, thus increasing grid reliability and reducing reliance on fossil fuels.

Biodiversity and Conservation

AI-powered drones and image recognition systems support wildlife monitoring and habitat protection, enabling real-time data collection and analysis that inform conservation strategies.

Challenges and Ethical Considerations

- **Data Bias and Equity:** Ensuring diverse, representative data avoids skewed conclusions that could disadvantage vulnerable communities.
- **Transparency and Accountability:** Clear reporting of AI's environmental footprint is essential to maintain public trust.
- **Balancing Innovation and Responsibility:** Rapid AI advancements must be paired with policies that encourage sustainable development.

Conclusion

Artificial Intelligence stands at a crossroads with the environment. While its growing computational demands pose environmental risks, AI's potential to revolutionize sustainability efforts offers an unprecedented opportunity. Responsible innovation, energy-efficient technologies, and thoughtful policy will determine whether AI becomes a profound tool for environmental stewardship or an exacerbating factor in climate challenges.

References

1. Acemoglu, D. (2024), “The Simple Macroeconomics of AI”; NBER Working Papers 32487. <https://www.nber.org/papers/w32487>
2. Adams, H.S. (2024), “Sage Geosystems & Meta’s Geothermal Power Generation”, DataCentre Magazine. <https://datacentremagazine.com/technology-and-ai/sage-geosystems-metas-geothermal-power-generation>
3. Aguilar, A., M. Balmaseda, A. Melguizo and V. Muñoz (2023),
4. Digitales, verdes y aliados. Impacto económico, social y medioambiental de la iniciativa Global Gateway y la Alianza Digital UE-América Latina y el Caribe. Telefónica and Fundación Carolina.
5. <https://www.fundacioncarolina.es/catalogo/digitales-verdes-y-aliados-impacto-economico-social-y-medioambiental-de-la-iniciativa-global-gateway-y-la-alianza-digital-ue-america-latina-y-el-caribe/AFP> (2024),

isbn 978-93-5759-293-2

Environmental history

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Introduction

Like every other subset of history, environmental history is different things to different people. The author's preferred definition is: the history of the relationship between human societies and the rest of nature on which they depended. This includes three chief areas of inquiry, which of course overlap and have no firm boundaries. First is the study of material environmental history, the human involvement with forests and frogs, with coal and cholera. This entails study of the evolution of both human impact on the rest of nature and nature's influence upon human affairs, each of which is always in flux and always affecting the other. This form of environmental history puts human history in a fuller context, that of earth and life on earth, and recognizes that human events are part of a larger story in which humans are not the only actors. In practice, most of the historical work in this vein concerns the last 200 years, when industrialization among other forces greatly enhanced the human power to alter environments. Second is political and policy-related environmental history. This concerns the history of self-conscious human efforts to regulate the relationship between society and nature, and between social groups in matters concerning nature. Thus efforts at soil conservation or pollution control qualify, as perhaps do social struggles over land and resource use. Political struggle over resources is as old as human societies and close to ubiquitous. The author would not use the term environmental history to refer to contests between one group of herders and another over pastures; but he would use the term to refer to struggles over whether a certain patch of land should be used as pasture or farmland. The difference lies in the fact that the outcome of the struggle carries major implications for the land itself, as well as for the people involved.

Mode of Production and Modes of Resource Use This concept was first introduced by Karl Marx in his efforts to theorize the overall structure and dynamic of capitalism. It has since been widely used, mainly in Marxist political economy and historical studies, to analyse various economic systems. Although there is broad agreement on its general field of application, different

approaches exist towards defining and distinguishing particular modes of production. Some of the resulting problems are considered below. Marx used the concept of mode of production in two main ways; to analyse the economic base and to describe the overall structure of societies. Thus he employed it to specify the particular combination of forces and relations of production which distinguished one form of labour process and its corresponding form of economic exploitation from another. He also employed it to characterize the overall pattern of social reproduction arising from the relations between the economic base (comprising production, exchange, distribution and consumption) and the legal, political, social and ideological institutions of the so-called superstructure. The latter usage is particularly problematic. Its conceptual basis is fuzzy and it encourages monocausal economic analyses of whole societies. But even the more rigorously defined and carefully theorized analysis of production proper involves problems.

Eco-System of Sangam age in South India Three states, namely, Cholas, Cheras, and Pandya emerged in south India. Sangam literature believes that the dynasties of Chola, Chera, and Pandya belong to immemorial antiquity.

Chola Dynasty

The Cholas have occupied the region of Kaveri delta and the adjoining area. The region of Kanchi was also part of the Cholas kingdom. The Kingdom was situated towards the north-east of Pandya kingdom and it was also called as Cholamandalam in early medieval times. In the beginning, its capital was Uraiyur in Tiruchirapalli, but subsequently shifted to Kaveripattanam. It was called as Puhar' at that time.

Pandya Dynasty

The Pandya kingdom was the second important kingdom in south India during this period. It occupied the region of modern districts of Tirunelveli, Ramnad, and Madurai in Tamil Nadu. The capital of Pandya kingdom was Madurai. The Pandyan kingdom was very wealthy and prosperous. The Sangam literature gives information and names of a few kings. Nedunjeliam was a great Pandya king. He defeated the combined forces of Chera, Chola, and five other

minor states in a war against him at Madurai. The Pandyan kings assembled literary assemblies called as Sangam.

Chera Dynasty

The Cheras were also known as Keralaputras' in the history. The Chera kingdom occupied the region of a narrow strip between the sea and the mountains of Konkan range. The Chera rulers also occupied high position in the history of south India. Nedunjeral Adan was a famous Chera king. He conquered Kadambas with his capital at Vanavasi (near Goa). He also defeated the Yavanas. Nedunjeral Adan had a good relation with the Greeks and Romans who came in large numbers as traders and set up large colonies in south India. Nedunjeral Adan fought a battle with the father of the Chola king Karikala. In this battle, both the kings were killed. Nedunjeral Adan was called as Imayavaramban. The literary meaning of the term Imayavaramban is one who had the Himalaya Mountains as the boundary of his kingdom." However, it seems to be mere exaggeration. Sengutturan was the greatest king of the Chera dynasty as mentioned in the Chera tradition. He had defeated the Chola and the Pandya kings. The Chera power declined at the end of the 3rd century A.D. They again acquired power in the 8th century A.D. The important facts about the three early kingdoms of south India are They constantly fought with each other; They made new alliances against the ones who became powerful; and They also fought regularly with Sri Lanka and ruled there at some point of time.

References:

1. W. Coleman, "Science and Symbol in Turner Frontier Hypothesis", American Historical Review, vol. 72, M. Gadgil and R. Thaper, "Human Ecology in India: Some Historical Perspectives", Interdisciplinary p. 30.
2. F.R. Allchin refers to significant degradation of the original forest cover in south India through "intensive" use by early pastoralists. F.R. Allchin, Neolithic Cattle-Keepers of South India: A Study of the Deccan Ashmonds, CUP: London, 1963, pp. 170-1 71.
3. M. Gadgil, "Ecological Organisation of Indian Society", ICSSB Newsletter, XXI (4), Jan.-March 1991, pp. 1-9.

4. Arnold D. and R. Guha 1995. Nature, Culture, and Imperialism: Essays on the Environmental History of South Asia. Delhi: New Oxford University Press.
5. Baviskar, Amita (Ed.). 2008. Contested Waterscapes. Delhi: Oxford University Press. Final Order of Cauvery Water Disputes Tribunal (Clause I to XXI), 2007. Govt. of India.

isbn 978-93-5759-293-2

The Role of Artificial Intelligence (AI) in Economics

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Introduction

“AI refers to the development of computer systems that can perform tasks typically requiring human intelligence. These tasks include learning, reasoning, problem-solving, perception, language understanding, and decision-making. AI systems are designed to process large amounts of data and improve their performance over time through techniques like machine learning and deep learning. AI has been applied in various domains such as healthcare, finance, transportation, and entertainment, significantly transforming these industries” (Russell & Norvig, 2021). When it comes to application in economics, artificial intelligence relies on huge data, complex algorithms, trend analysis, optimisation, and prediction.

The Impact of AI on Economic Sectors

1. Business and Industry

AI has transformed the way business is conducted through increasing efficiency and changing decision-making. AI has helped to automate manufacturing, thereby cutting side costs and boosting productivity. You can have AI-powered robots working tirelessly in factories to produce products at a consistent quality/speed and reduce the number of errors introduced by humans, for instance.

For instance, AI assists in the mapping of what trends and demand patterns customers might prefer in retail. As an example, one of the most popular use cases for AI in retail is that it can help retailers take advantage of customer data to optimise store inventory — identifying which products are likely to sell out because something big happened (such as a celebrity being seen wearing it) or what won't move at all and should be marked down. It enhances customer satisfaction and saves on inventory carrying costs.

AI systems for trading, fraud detection, and other features in finance can analyse market trends much quicker than any human, so they make decisions faster and more accurately. In fact, many **BA Economics colleges** now include AI-driven financial tools in their curriculum, which

help the students develop the skills necessary to work with data and algorithms in real-world scenarios. That is why an AI system for trading, fraud detection, and other features in finance can analyse market trends much faster than any human will do it and therefore will react quicker and more precisely than a person. A game changer in providing personal financial advice, AI also helps to provide personalised financial advice, making it intuitive for individuals to invest and manage their investments.

2. Labour Markets

It is even reshaping the labour market, too. Although the fear of losing jobs to AI is real, there is a difference between fiction and reality. This usually results in most of the repetitive, routine activities being fulfilled by AI, that way freeing up humans for more creative and complex parts. In healthcare, where human lives are at stake, AI systems can enable doctors to diagnose diseases quickly and have more time for treatment and patient care.

Moreover, new industries and new employment opportunities appear because of AI. There is an extraordinary growth in demand for AI specialists, data scientists, and cybersecurity experts who are now given new career paths. But to take these new opportunities, workers must acquire new skills and adapt to the changing job market.

3. Economic Policy and Decision-Making

The use of AI by governments and policymakers in decision-making is bound to increase going forward. Given large datasets, AI systems are well equipped to provide insights into trends of economic variables, inflation rates, employment statistics, and other critical indicators that will assist policymakers in finding effective policies for stabilising economies, creating sustained growth, and reducing inequality.

An example of this will be AI forecasting the impacts of different policy choices, such as interest rate changes or new taxes. Thus, a government, through simulation of various possible economic scenarios, can better prepare itself for various future challenges such as recessions and global financial crises. This technology has already started becoming a key focus in the top BA Economics Honours colleges, wherein the students are trained in both theoretical economics and data analysis to better understand the implications of AI on policy-making.

4. Economic Forecasting and Modelling

Among other critical roles AI plays in economics is the forecasting aspect. Economics traditionally uses history-based models and assumes things that do not have to apply in a fast-changing world. AI, for example, can process enormous amounts of real-time data; it identifies different patterns, and it adapts to make predictions accordingly.

This can strengthen economic modelling since AI can consider not only the factors of consumer behaviour and supply chain disruptions but also geopolitical risks. This makes economic growth, inflation, unemployment, and even a possible financial crisis more predictable. Such knowledge helps businesses, governments, and financial institutions make better decisions and mitigate risks with maximum efficiency.

Conclusion:

Artificial intelligence essentially revolutionises economics. It has the potential to make firms more productive, lead to better economic policies, and improve decisions with optimized use of data. In fact, the same solutions also present new difficulties in terms of job displacement, bias, and ethics.

As we move forward, we must take the opportunities of AI and confront its challenges. Doing so will enable us to fashion an economic landscape that will work for businesses and governments and, most importantly, for people, with the resultant sustainable growth and prosperity.

At The **NorthCap University**, students enrolled in programs such as BBA-Business Analytics, BBA-Digital Marketing, and BA in Economics (Honours) receive education highly integrated with AI and data-driven insights. Its AI curriculum includes machine learning, data mining, and predictive analytics and trains students to analyse large datasets and make the best decisions. With an AI-enabled curriculum, students will leave the institution with practical knowledge of emerging technologies and skills in working with the capability of critical thinking and solving problems. The university thus readies its graduates to thrive in a rapidly evolving, tech-driven global marketplace by fusing ideas of AI with business and economics.

Therefore, students looking to enroll in one of the best colleges for BA Economics should ensure that the BA in Economics combines AI integration that will empower them with future-proof

skills. It is imperative to know that in the heartland of the urban city of Gurugram, NCU is known for offering a BA degree in Economics with its multidisciplinary approach and high-quality education standards.

All in all, whether you are looking for comprehensive BA Economics courses or wish to explore the best BA in Economics colleges, it is important to know that the way forward—in terms of career scope, technological advancements, and societal betterment—is AI integrated with Economics, which will ensure a promising future.

References

1. Bhattarai, Abha; Lerman, Rachel (25 December 2025). "10 charts that show where the economy is heading / 3. AI related investments". The Washington Post. Source: MSCI
2. "Electricity 2024 – Analysis". IEA. 24 January 2024. Retrieved 13 July 2024.
3. Calvert, Brian (28 March 2024). "AI already uses as much energy as a small country. It's only the beginning". Vox. New York, New York. Archived from the original on 3 July 2024. Retrieved 5 October 2024.
4. Halper, Evan; O'Donovan, Caroline (21 June 2024). "AI is exhausting the power grid. Tech firms are seeking a miracle solution". Washington Post.
5. Davenport, Carly. "AI Data Centers and the Coming YS Power Demand Surge" (PDF). Goldman Sachs. Archived from the original (PDF) on 26 July 2024. Retrieved 5 October 2024.

Bishnoi Movement- campaign for environmental preservation

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Introduction

The Bishnoi movement was among the earliest groups to campaign for environmental preservation, wildlife protection, and sustainable living. The Bishnoi family is regarded as India's first environmentalists. This movement was the first in the history of environmental movements to embrace the technique of hugging and embracing trees to protect them. One of the first initiatives for environmental protection is the well-known Bishnoi movement Amrita Devi movement. When Jodhpur's King Abhay Singh was constructing his new palace in the 1730s, he ordered his soldiers orders to clear the trees in the village of Khejarli for wood. Amrita Devi fought for the survival of trees by clinging to them as a sign of protest as she stood against the military. Asu, Ratni, and Bhagu, three of her daughters, supported their mother. The other town residents joined them in standing up for the trees and circling their trunks in support. Without stopping to listen to the people's requests, the soldiers kept felling trees. The Bishnoi community cultural beliefs, which are reflected in their sect's tenets and advocate the preservation of trees and wildlife, were the primary factor in their opposition to tree cutting. Another factor or a cause of the Bishnoi movement was their reliance on the forest for the source of fuel wood and fodder, which was directly tied to their rural way of life. Bishnoi from Khejarli and nearby villages joined the protest and hugged these Khejri trees one by one to save them from being cut down at the possibility of losing their lives. In this movement, 363 127 Bishnois of Rajasthan gave their life to safeguard the Khejri trees in the Rajasthani village of Khejarli. The Bishnoi movement had a profound impact on people's minds and memories, leaving an ever-lasting impression.

Beginning of Bishnoi Community

By Guru Jambheshwar, the Bishnoism sect was established. To be followed by the sect, he established 29 precepts. Bish is equivalent to 20, while noi is equivalent to 9. Bishnoi means twenty-nine, as a result. The name "BISHNOI" would be given to those who sincerely adhere to

the 29 ideals. Western India, particularly Rajasthan, is home to the non-violent Bishnoi community, which worships the environment.

Goals of the Bishnoi Movement

There were four main objectives of the Bishnoi movement, which are as follows:

1. To protect the region's biodiversity by guaranteeing a healthy, eco-friendly social life for the community.
2. To encourage proper personal cleanliness, fundamental health, and responsible social engagement.
3. Another objective of the Bishnoi movement is to campaign against the removal of such trees and support anti-deforestation movements.
4. To protect biological variety and promote responsible animal husbandry.

Achievement of Bishnoi Movement

Following this incident of the Bishnoi movement, the maharaja issued a stringent royal proclamation prohibiting tree chopping in all Bishnoi villages. The history of Bishnoism, which began around 1730 A.D., is where the idea of embracing trees and tree huggers originated. The Chipko Movement of the 20th century, led by Sunder Lal Bahuguna, was inspired by the Bishnoi movement and sacrifice. Additionally, the governments of Rajasthan & India presented the Amrita Devi Bishnoi Smrithi Paryayaran Award and the Amrita Devi Bishnoi Wildlife Protection Award in recognition of their contributions towards the preservation of nature and the protection of wildlife, respectively.

References

1. Dangwal, Dharendra Datt. 2009. Himalayan Degradation. Colonial Forestry and Environmental Change in India, New Delhi: Cambridge University Press India, p. 324.
2. Dhavalikar, M.K. Environment and Culture. Bhandarkar Oriental Research Institute, Pune. Guha, R. 1989.
3. The Unquiet Woods: Ecological Change and Peasant Resistance in the Western Himalaya. Delhi: Oxford University Press.

4. Guha, Sumit 1999 *Environment and Ethnicity in India 1200-1991*. Cambridge: CUP. Guha, R. 2000.

5. *Environmentalism: A Global History*. New York. Gadgil, Madhav and Ramchandra Guha, 1992.

Historical contributions for environment

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Introduction

The field emerges still more clearly when considering its range and subject matter, including the prominent issues raised in public discourse on the environment—land degradation, air and water pollution and waste disposal, wildlife conservation and wilderness preservation—but its importance goes beyond simply adding time-depth to current political debates. Environmental history encompasses a holistic view of history through the human–nature nexus, and, while not all history is environmental, the field has quite broad parameters. A recent list of topics in U.S. environmental history applies well, with modifications, to global concerns.

Contributions

Environmental history is the study of human interaction with the natural world over time, emphasising the active role nature plays in influencing human affairs and vice versa.

Environmental history first emerged in the United States out of the environmental movement of the 1960s and 1970s, and much of its impetus still stems from present-day global environmental concerns. The field was founded on conservation issues but has broadened in scope to include more general social and scientific history and may deal with cities, population or sustainable development. As all history occurs in the natural world, environmental history tends to focus on particular time-scales, geographic regions, or key themes. It is also a strongly multidisciplinary subject that draws widely on both the humanities and natural science.

The subject matter of environmental history can be divided into three main components. The first, nature itself and its change over time, includes the physical impact of humans on the Earth's land, water, atmosphere and biosphere. The second category, how humans use nature,

includes the environmental consequences of increasing population, more effective technology and changing patterns of production and consumption. Other key themes are the transition from nomadic hunter-gatherer communities to settled agriculture in the Neolithic Revolution, the effects of colonial expansion and settlements, and the environmental and human consequences of the Industrial and technological revolutions. Finally, environmental historians study how people think about nature – the way attitudes, beliefs and values influence interaction with nature, especially in the form of myths, religion and science.

In 2001, J. Donald Hughes defined the subject as the "study of human relationships through time with the natural communities of which they are a part in order to explain the processes of change that affect that relationship" and, in 2006, as "history that seeks understanding of human beings as they have lived, worked and thought in relationship to the rest of nature through the changes brought by time". "As a method, environmental history is the use of ecological analysis as a means of understanding human history...an account of changes in human societies as they relate to changes in the natural environment". Environmental historians are also interested in "what people think about nature, and how they have expressed those ideas in folk religions, popular culture, literature and art". In 2003, J. R. McNeill defined it as "the history of the mutual relations between humankind and the rest of nature".

Conclusion

There is no universally accepted definition of environmental history. In general terms it is a history that tries to explain why our environment is like it is and how humanity has influenced its current condition, as well as commenting on the problems and opportunities of tomorrow. Donald Worster's widely quoted 1988 definition states that environmental history is the "interaction between human cultures and the environment in the past".

References

1. Barton, Gregory A. (2002). *Empire, Forestry and the Origins of Environmentalism*. Cambridge University Press. doi:10.1017/CBO9780511493621. ISBN 9780511493621. - covers British Empire

2. Beattie, James; Melillo, Edward; O'Gorman, Emily, eds. (2015). *Eco-cultural Networks and the British Empire: New Views on Environmental History*. New York and London: Bloomsbury. ISBN 9781441109835.
3. Boccaletti, Giulio. *Water: A Biography* (Pantheon Books, 2021) online review of this book
4. Bolton, Geoffrey (1981). *Spoils and Spoilers: Australians Make Their Environment, 1788-1980*. Allen & Unwin. p. 197. ISBN 9780868612188.
5. Clover, Charles (2004). *The End of the Line: How overfishing is changing the world and what we eat*. London: Ebury Press. ISBN 0-09-189780-7.
6. Guha, Ramachandra (1999). *Environmentalism: A Global History*. Pearson Education. ISBN 978-0321011695.
7. Headrick, Daniel R. (2020). *Humans Versus Nature: A Global Environmental History*. New York: Oxford University Press.
8. Jones, Eric L. (1991). "The History of Natural Resource Exploitation in the Western World". *Research in Economic History*. Supplement 6: 235–252.
9. Krech, Shepard; McNeill, John R. & Merchant, Carolyn (2003). *Encyclopaedia of World Environmental History Vol 1–3*. London: Routledge. ISBN 978-0-415-93732-0.

isbn .

Significance of AI in Commerce

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Introduction

With increasing digitalization, AI is becoming an essential tool for businesses looking to maintain a competitive edge in a rapidly evolving marketplace. As companies continue to embrace AI, it is crucial to understand its role, advantages, challenges, and future implications. This paper aims to analyze the impact of AI in commerce, its applications, advantages, and challenges, as well as its future prospects.

Applications of AI in Commerce

AI in Marketing and Consumer Behavior Analysis AI-powered tools analyze customer preferences and behavior to create personalized marketing campaigns. Machine learning algorithms help businesses target specific consumer segments with tailored advertisements, leading to increased engagement and sales.

AI in Customer Service Chatbots and virtual assistants powered by AI handle customer queries efficiently, reducing response times and enhancing customer satisfaction. AI-driven customer service systems offer 24/7 support and personalized interactions, improving brand loyalty.

AI in Inventory and Supply Chain Management AI helps optimize inventory levels by predicting demand patterns and minimizing waste. AI-driven supply chain solutions improve logistics, reduce costs, and enhance overall efficiency.

AI in Financial Management and Fraud Detection AI-powered analytics assist in financial planning, risk assessment, and fraud detection. Machine learning algorithms identify suspicious transactions, preventing financial fraud and ensuring regulatory compliance.

AI in E-Commerce and Personalized Shopping AI enhances the e-commerce experience by providing personalized recommendations based on browsing history, past purchases, and user preferences. AI-driven recommendation engines improve customer retention and increase sales.

Benefits of AI in Commerce

Enhanced Efficiency: AI automates repetitive tasks, allowing businesses to focus on strategic initiatives.

Cost Reduction: AI-driven automation reduces operational costs and improves productivity.

Improved Decision-Making: AI-powered analytics provide valuable insights for better business decisions.

Personalized Customer Experience: AI enhances customer satisfaction through tailored recommendations and services.

Fraud Prevention and Security: AI helps detect fraudulent activities and enhances cybersecurity.

Challenges of

AI Implementation in Commerce

High Implementation Costs: AI adoption requires substantial investment in technology and training.

Data Privacy Concerns: Businesses must address concerns related to data security and consumer privacy.

Integration with Existing Systems: AI implementation requires seamless integration with legacy systems.

Ethical and Bias Issues: AI algorithms may reflect biases, leading to unfair business practices.

Workforce Displacement: AI-driven automation may reduce human labor requirements, affecting employment opportunities.

Conclusion

AI is transforming commerce by making businesses more efficient, customer-centric, and data-driven. Its applications across various business functions provide significant advantages, although challenges must be addressed. The future of AI in commerce offers innovative solutions that will continue to reshape business operations and create new opportunities for growth.

References

1. Brynjolfsson, E., & McAfee, A. (2017). *Machine, Platform, Crowd: Harnessing Our Digital Future*. W. W. Norton & Company.
2. Davenport, T., & Ronanki, R. (2018). "Artificial Intelligence for the Real World." *Harvard Business Review*.
3. Agrawal, A., Gans, J., & Goldfarb, A. (2018). *Prediction Machines: The Simple Economics of Artificial Intelligence*. Harvard Business Review Press.
4. Chui, M., Manyika, J., & Miremadi, M. (2016). "Where Machines Could Replace Humans—and Where They Can't (Yet)." *McKinsey Quarterly*.
5. Russell, S., & Norvig, P. (2021). *Artificial Intelligence: A Modern Approach*. Pearson.
6. Bughin, J., Seong, J., Manyika, J., Chui, M., & Joshi, R. (2018). "Notes from the AI Frontier: Modeling the Impact of AI on the World Economy." *McKinsey Global Institute*.

isbn 978-93-5759-293-2

Artificial-Intelligence- Organic Synthesis

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Introduction

Traditionally, total synthesis of complex molecules including organic synthesis involves creativity, meticulous assessment of each step for yield of desired product, and reiterative process to modify the reactions for specific biochemical or biological properties (e.g., bioavailability, solubility) and optimize yields. AI is being used to propose reaction methodology such as novel pathways for synthesis of compounds. Empel and Koenigs suggest that the next evolutionary step in AI would be automated multistep synthesis of complex molecules. Although similar, automated and autonomous synthesis differ by their need for human input. Human input is required during automated synthesis to define thresholds, boundaries, reaction parameters, and synthesis protocols in the reaction files. In comparison, autonomous synthesis is a self-governing synthetic process that adjusts to surrounding parameters such as stereoselectivity and reaction yield without human input.

Breakthroughs

Many drugs are small molecules with diverse chemical structures and thus, require customized procedures which consume both money and highly trained labor. Burke developed iterative carbon 2D and 3D cobalt catalysts (C-Csp², C-Csp³) assembly strategy and automated the process to synthesize 14 diverse classes of small molecules. The use of tetramethyl N-methyliminodiacetic acid (TIDA) supported C-Csp³ bond formation. This synthesis machine coupled with more than 5000 commercial building blocks could support the synthesis of numerous small molecules.

Limitations of Traditional Retrosynthetic Analysis and Automated Synthesis

Without AI support, chemists can easily miss pertinent combinations of novel substrates, reaction optimization, design of improved catalysts and novel reactions in the rapidly expanding body of chemical literature. All disciplines of chemical sciences consider synthesis of small molecules as a bottleneck and automated on-demand synthesis can help overcome this challenge.

Poorly soluble compounds provide extra challenges in automated workflows and often require more human input to improve the process because of clogging the channels. Predictions on the solubility of reactants in the proposed synthesis plan remain limited which hampers the execution Article 18 Green of some synthetic routes. Reactions that require or yield subambient temperatures usually also need advice from an expert chemist to maintain efficient workflow. After the automated synthesis, batch purification will be required for the final compound and may need special equipment such as particular columns.

Future Improvements

Multiple groups are working on improving AI-driven analysis and prediction of stereochemistry and methods to favor the desired stereochemical structure in the proposed synthesis. This improvement could reduce the human input needed for the modification(s) and use of the chemical recipe files.

In the future, AI also may be able to propose continuous purification schemes or batch purification systems to provide relatively pure target compound. The addition of online reaction analytics could provide important information on reaction progress and allow feedback algorithms to alter reaction parameters in real time and potentially improve efficiency and yield.

Challenge and Outlook

Much progress in automatic and autonomous AI-driven platforms for organic synthesis have been accomplished. However, widespread adoption would be hastened by addressing the following challenges. Seamless integration of the automated synthetic platform which contains modules for reagent storage, reaction preparation module, numerous reactor modules, integrated

analytical instrument(s) for monitoring reactions, purification system, management system for compound, monitoring unit, and console. Due to space limitations in most laboratories, the size of the instruments and platform ideally would be no larger than a fume hood.

Conclusion

AI-driven proposed plans to include purification scheme(s) and /or in-process reaction analytics to further automate the synthesis process. These improvements would divert the routine synthesis and optimization work to robots so that chemists can spend more effort on curiosity-driven research projects, thorough reaction monitoring and analysis, and serendipitous discoveries.

References

1. Coley, C.W. *et al.* (2019). A robotic platform for flow synthesis of organic compounds informed by AI planning. *Science*. DOI: 10.1126/science.aax1566.
2. C. Empel, R. M. Koenigs, *Angew. Chem. Int. Ed.* **2019**, 58, 17114.
3. Angello, N.H. *et al.* (2022). Closed-loop optimization of general reaction conditions for heteroaryl Suzuki-Miyaura coupling. *Science*. DOI: 10.1126/science. adc8743.
4. Burger, B. *et al.* (2020). A mobile robotic chemist. *Nature*. DOI: 10.1038/s41586- 020-2442-2.
5. Zhu, Q. *et al.* (2022). An all-round AI-Chemist with a scientific mind. *National Science Review*. DOI: 10.1093/ nsr/nwac190.

AI role in job Placements

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Introduction:

Colleges face increasing pressure in today's competitive job market to ensure their graduates secure meaningful employment. Placement outcomes not only reflect the institution's reputation but also significantly impact student satisfaction and future admissions. To enhance placement success, colleges are turning to technological innovations especially artificial intelligence (AI).

With AI tools for recruitment revolutionizing hiring processes worldwide, educational institutes can harness these advancements to streamline and improve their campus placement drives.

This blog explores how colleges can leverage AI tools for recruitment, including AI recruiting tools and AI interview tools, to deliver better placement results.

Transforming Placements with AI Tools for Recruitment:

Colleges traditionally rely on manual processes for selecting candidates during placements, including resume shortlisting, scheduling interviews, and subjective evaluation by recruiters. This often leads to inefficiencies, delays, and inconsistent outcomes. AI tools for recruitment automate and augment these steps by using data-driven insights and intelligent matching algorithms.

AI recruiting tools help colleges by:

- Automating candidate screening, reducing human bias, and increasing speed

- Matching student profiles with job requirements using AI algorithms that analyse skills, experience, and personality traits

- Generating role-specific interview questions automatically to standardize assessment

- Providing detailed analytics and reports on candidate performance and interview outcomes

Colleges can handle larger volumes of candidates efficiently, identify the best fits faster, and present more competitive talent to employers by integrating these AI recruiting tools into placement processes.

Enhancing Interview Quality with AI Interview Tools

One of the critical stages in placement is the interview, which determines whether a candidate progresses or secures a job offer. AI interview tools enhance this stage by offering features such as asynchronous video interviews, automated evaluation, and real-time candidate feedback.

Asynchronous Interviews: Candidates record responses at their convenience, allowing placement teams and recruiters to review at flexible times. This flexibility eliminates scheduling conflicts and speeds up the hiring cycle.

Automated Evaluations: AI algorithms assess candidate responses based on criteria like clarity, relevance, AI soft skills, and technical knowledge. This creates objective scoring that reduces interviewer bias.

Candidate Preparation: Many AI interview tools offer mock interviews and feedback, helping students practice and refine their interviewing skills, ultimately boosting their confidence.

Structured Interview Pipelines: AI tools enable institutions to create customized interview flows, sequencing questions by difficulty technical and behavioural

Implementing AI interview tools can significantly raise the quality and consistency of placement interviews, ensuring candidates are assessed fairly and recruiters spend time on top prospects.

Seamless Recruitment Automation for Placement Teams

AI recruiting tools extend beyond interviews to automate recruitment workflows like resume screening, candidate communication, scheduling, and analytics reporting. For college placement cells as follows:

Automating resume shortlisting using AI-powered parsing and ranking engines.

Engaging candidates automatically with chatbots that answer queries and schedule interviews.

Monitoring candidate pipelines with dashboards that highlight bottlenecks and success rates.

Enabling bulk interview campaigns to assess large student batches swiftly.

Such automation reduces the administrative burden on placement teams, allows recruiters to focus on quality engagement, and shortens the overall recruitment cycle.

Conclusion:

To maximize the benefits of AI tools for recruitment and AI interview tools, colleges should consider the following steps:

Training Placement Teams: Ensure recruiting officers understand how to use AI tools effectively and interpret AI-driven insights

Preparing Students: Provide awareness sessions and access to AI-powered preparation platforms to boost candidate confidence

Customize Interview Pipelines: Tailor interview questions and evaluation rubrics to align with specific job profiles and employer expectations

Integrate with Existing Systems: Connect AI tools with college ERP and applicant tracking to maintain data integrity and streamline workflows

Monitor and Iterate: Use analytics dashboards to review placement performance continuously and refine strategies using AI insights

Source: The Impact of AI on Student Placement Applications, Dave McCall and Zoë Allman

Published: 4 March 2025

AI and Green Chemistry

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Introduction

Artificial intelligence (AI) is receiving more and more attention as Industry 4.0 progresses because of its ability to solve particularly challenging challenges in chemical engineering and industrial chemistry. Consequently, this study offers a summary of how artificial intelligence (AI) techniques—specifically, machine learning—have been applied in recent years to chemical design, synthesis, and process optimisation. We conclude by talking about the difficulties and prospects for AI in the production of chemicals. Through its promotion of sustainable development, artificial intelligence has the potential to revolutionise the way the world deals with the threat posed by climate change to humankind. There is no going back to sustainability. Chemistry will be essential in helping the economy reach net-zero emissions as companies shift from using fossil fuels to renewable energy sources. Chemistry has, in fact, always been at the forefront of the development of new or improved materials to meet society expectations and produce commodities with the proper physical or chemical properties.

The chemical industry is at the forefront of a global shift toward sustainability. Mounting regulatory pressure, increased public awareness, and the scientific imperative to reduce environmental harm are all driving innovation. Two of the most promising advancements fueling this transformation are:

- **Artificial Intelligence (AI)** – Enabling rapid prediction, screening, and discovery of greener alternatives.
- **Sustainable Solvents** – Offering low-toxicity, biodegradable replacements for hazardous volatile organic compounds (VOCs).

In this article, we explore how AI is accelerating the adoption of sustainable solvents by optimizing selection processes, predicting reaction outcomes, and enabling the design of next-generation materials with minimal ecological impact.

The Problem with Traditional Solvents

Conventional solvents such as **toluene**, **acetone**, **dichloromethane (DCM)**, and **N-methyl-2-pyrrolidone (NMP)** are deeply embedded in chemical synthesis and processing. However, their widespread use comes at a significant cost:

- **Environmental damage:** VOCs contribute to ozone layer depletion, groundwater contamination, and atmospheric smog formation.
- **Human health risks:** Many solvents are linked to carcinogenicity, neurotoxicity, and reproductive toxicity.
- **Regulatory tightening:** Agencies like the EPA, REACH, and ECHA are imposing stricter controls or outright bans on high-risk solvents.

The Green Chemistry Response

Green chemistry advocates for **solvents that are biodegradable, derived from renewable feedstocks, and inherently safer**. But discovering such solvents is traditionally a trial-and-error process—one that's slow, expensive, and limited by human intuition.

How AI is Accelerating Green Solvent Development

1. Predictive Modeling for Solvent Selection

AI models trained on historical reaction data can forecast solvent efficacy and compatibility **before any lab work is done**. Key benefits include:

- **Pre-lab performance prediction:** Tools like **IBM RXN for Chemistry** and **DeepMatter's DigitalGlassware** can evaluate solvents in silico.
- **Optimized reaction conditions:** ML models adjust parameters such as temperature, pressure, and catalyst presence to maximize yield and minimize waste.
- **Bio-based recommendations:** AI frequently identifies renewable alternatives like **limonene**, **γ -valerolactone**, and **Cyrene™**.

2. AI-Driven Discovery of Novel Solvents

Beyond substitution, AI can design entirely new solvent molecules from scratch:

- **Toxicity-aware design:** Leveraging QSAR (quantitative structure–activity relationship) models, AI filters out candidates with mutagenic or toxic potential.
- **Pre-synthesis biodegradability prediction:** Saves time and cost by simulating environmental fate and degradation rates.
- **Custom property tuning:** Algorithms match polarity, viscosity, boiling point, and solubility with specific application requirements.

3. Minimizing Trial-and-Error in Lab Work

AI dramatically reduces the need for exhaustive experimental screening:

- **Faster solvent shortlisting:** Platforms like **Schrödinger's Materials Science Suite** generate candidate lists in minutes.
- **Hazard avoidance:** AI flags risky combinations (e.g., flammable + halogenated solvents) during the design phase.
- **Lower development costs:** Fewer failed experiments means leaner, more sustainable R&D pipelines.

Closed-Loop Solvent Systems

AI-optimized recovery units will track solvent reuse cycles, reducing virgin solvent input and waste generation.

Blockchain for Solvent Traceability

Smart contracts and decentralized ledgers can verify green sourcing, carbon impact, and circularity in real time.

Autonomous Self-Optimizing Reactors

Machine-learning-enabled reactors will adapt in real time, adjusting temperature, solvent flow, and concentration for optimal sustainability metrics.

Conclusion

The convergence of **AI and green chemistry** marks a pivotal shift in how solvents are discovered, assessed, and deployed. As predictive algorithms become more sophisticated and chemical databases grow, the industry is poised to phase out VOCs in favor of smarter, safer, and more sustainable alternatives. These advancements don't just comply with regulations—they represent a proactive strategy for environmental stewardship, health protection, and scientific excellence.

References

1. Li, C. *et al.* (2022). Automated Flow Synthesis of Peptide-PNA Conjugates. *ACS Central Science*. DOI: 10.1021/acscentsci.1c01019.
2. Mo, Y. *et al.* (2020). A Multifunctional Microfluidic Platform for High-Throughput Experimentation of Electroorganic Chemistry. *Angewandte Chemie - International Edition*. DOI: 10.1002/anie.202009819.
3. Xie, M. *et al.* (2022). Fast Screening for Copper-Based Bimetallic Electrocatalysts: Efficient Electrocatalytic Reduction of CO₂ to C₂+ Products on Magnesium-Modified Copper. *Angewandte Chemie - International Edition*. DOI: 10.1002/anie.202213423.
4. Chatterjee, S. *et al.* (2020). Automated radial synthesis of organic molecules. *Nature*. DOI: 10.1038/s41586-020-2083-5.
5. Xu, H. *et al.* (2022). High-throughput discovery of chemical structure-polarity relationships combining automation and machine-learning techniques. *Chem*. DOI: 10.1016/j.chempr.2022.08.008.
6. Steiner, S. *et al.* (2019). Organic synthesis in a modular robotic system driven by a chemical programming language. *Science*. DOI: 10.1126/science.aav2211.

AI-Enhanced Battery Management Systems for Electric Vehicles

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Introduction

Recent trends in BMS research focus on integrating machine learning and artificial intelligence to enhance state estimation, fault detection, and predictive maintenance. These technologies improve the adaptability of BMS to various operational conditions and enhance decision-making processes. However, challenges remain, particularly in thermal management, algorithm efficiency, and system reliability. Managing thermal performance is critical for maintaining battery safety and performance, with recent research exploring advanced cooling techniques and materials to improve heat dissipation. Innovations such as phase change materials and advanced cooling systems are being investigated for better thermal regulation .

Types of batteries

Batteries convert chemical energy into electricity, but the specific materials and technologies can differ. There are five main types of batteries used in today's electric vehicles.

Lithium-Ion Batteries

Modern electric cars, computers, and smartphones use lithium-ion battery packs due to their excellent performance, power-to-weight ratio, and hightemperature tolerance. Despite their extensive usage, the development of these batteries has been criticized for its environmental effect, underlining the need for more sustainable alternatives.

Nickel-Metal Hydride Batteries

Nickel-metal hydride batteries are commonly used in hybrid vehicles, despite their higher production costs and lower performance compared to lithium-ion batteries. They offer greater longevity and are more adept at handling frequent charging and discharging, which is typical in hybrids. Additionally, the battery packs in hybrid vehicles are generally smaller than those found in fully electric cars.

Lead-Acid Batteries

Lead-acid battery technology is well-established, known for its affordability and reliability, but it is primarily used as a starter battery in internal combustion engine vehicles. While it is occasionally used in modern electric vehicles, it is limited to auxiliary power systems rather than powering electric motors. Compared to newer battery technologies, lead-acid batteries have a shorter lifespan.

Ultra Capacitors

Ultra capacitors store energy by holding polarized liquid between an electrode and an electrolyte. They are not designed to serve as the main power source but rather as a supplementary battery pack that helps balance the load of the primary lithium-ion battery. Essentially, they act as an intermediary between the main battery and the electric motor, often used to boost acceleration.

Solid-State Batteries

Solid-state batteries are poised to be a major advancement in the electric vehicle sector, with widespread adoption expected in the coming years. Unlike other battery types that use liquid electrolytes, solid-state batteries utilize ceramic materials, making them more environmentally friendly. They also promise greater stability, lower production costs, and easier manufacturing. Experts forecast that solid-state technology could cut battery production costs by up to 40%, representing a significant development.

Battery related issues

Battery Management System (BMS) faces several challenges that can affect the overall performance of a vehicle as shown in fig.3, One issue is battery degradation, which occurs as batteries go through repeated charge and discharge cycles, leading to a gradual loss of capacity and diminished range and efficiency of the electric vehicle. Overcharging is another critical concern; when a battery is charged beyond its maximum voltage, it can overheat and potentially trigger thermal runaway. To mitigate this risk, the BMS must carefully manage charging rates and enforce cutoff limits. Additionally, deep discharging allowing the battery to drop below its recommended level can cause permanent damage, impairing the battery's ability to retain charge and shortening its lifespan. To effectively manage battery-related issues, a sophisticated Battery

Management System (BMS) is essential. This system needs to offer real-time monitoring, adaptive algorithms, and comprehensive management strategies. By incorporating advanced sensors, predictive analytics, and robust safety features, the BMS can enhance battery performance, ensure safety, and prolong the lifespan of electric vehicle batteries.

Optimisation Techniques in BMS

State of charge estimation

SOC The ratio of a battery's current accessible capacity to its theoretical capacity is its State of Charge (SOC). SOC is usually stated as a percentage via the equation: $\text{SOC} = \frac{Q_{\text{remaining}}}{Q_{\text{total}}} \times 100\%$. State of Charge (SOC) cannot be directly measured as a physical quantity. However, accurately estimating the current SOC is crucial for ensuring that a battery system delivers its maximum capacity and provides a reliable assessment of the remaining driving range. SOC also helps the Battery Management System (BMS) calculate SOH, SOP, charging currents, and battery balance. State of charge (SOC) estimate accuracy has improved since the 1980s. Onboard battery management systems (BMS) use ampere-hour integral computation, lookup table, and model-based SOC estimate approaches.

State of health prediction

SOH State of Health (SOH) measures the charge capacity of an aged battery cell relative to that of a new one, providing insight into the battery's ability to meet operational demands. SOH is essential for assessing the current condition of a battery and estimating when it may require replacement. Various techniques for predicting SOH in lithium-ion batteries include feedforward algorithms, regression and probabilistic models, recurrent neural networks, and entropy-based approaches [27]. A 100% SOH represents a brand-new battery, while the SOH value decreases as the battery ages. Monitoring SOH helps determine the battery's current condition and when it might need to be replaced,

State-of-energy (SOE)

SOE Demonstrates how the battery's remaining energy compares to its maximum and usable energy to estimate this by considering the whole battery charge and discharge cycle.

State-of-power (SOP)

State of Power (SOP) is a battery's maximum power for a certain application. Discharging, operational voltage, and temperature affect SOP. SOP is estimated by multiplying operational voltage by maximum discharge current. SOP may vary when the battery degrades and the rated current changes. This approach improves measurements, helping create improved Battery Management Systems.

Self-discharge algorithm

Self-discharge occurs when a battery is left in an open circuit and loses capacity. A battery's self-discharge rate (SDR) indicates its capacity retention under different situations. Mechanism classifies self-discharge as irreversible or reversible. As seen in Figure 10, irreversible self-discharge causes capacity loss that cannot be restored in subsequent charging cycles. In contrast, reversible self-discharge restores capacity over consecutive charging cycles. Reversible self-discharge cells have a larger charge capacity than discharge capacity within a cycle. Metal impurities or burrs in manufacture can cause this. Self-discharge rates may cause SOC discrepancies, which can hasten battery pack capacity deterioration. Traditional techniques for measuring series cell self-discharge rate (SDR) include capacity direct measurement, open-circuit voltage (OCV) monitoring, and voltage floating. The capacity direct measuring technique is simple: charge the battery to a specified SOC, store it for many days, and observe capacity variations.

Thermal management

Managing battery temperature is crucial for optimizing electric vehicle (EV) performance. High temperatures can trigger thermal runaway in batteries, a condition where exothermic reactions accelerate uncontrollably. When temperatures surpass 90°C, the electrolyte, cathode, and solid electrolyte interface (SEI) layer start to break down. Among lithium-ion batteries, LiFePO₄ is notable for its exceptional thermal stability, as it releases less exothermic heat compared to other battery types. Research indicates that for every 1°C rise in temperature within the 30°C to 40°C range, the battery's lifespan can be reduced by about two months. A well-designed thermal

management system (TMS) is essential to maintaining battery temperatures within optimal limits. The TMS regulates battery temperature, ensuring that each cell operates within a specified threshold. If the temperature exceeds safe limits, the TMS activates heating or cooling mechanisms to protect the battery and ensure safe operation. This proactive management helps prevent overheating and potential damage.

Remaining useful life prediction

Estimating the remaining useful life (RUL) of a battery cell involves predicting the number of load cycles or the duration it will continue to perform effectively. RUL is a vital indicator that aids in real-time decision-making processes, such as detecting and diagnosing faults. However, accurately forecasting RUL can be difficult due to numerous uncertainties that may affect the predictions. Various methods exist for estimating RUL, which can be grouped into several categories: machine learning techniques, time-series analyses, statistical data-driven approaches, Monte Carlo simulations, and additional methodologies.

Conclusions

To improve and accept electric cars, sophisticated Battery Management Systems (BMS) must be developed and integrated. As EV batteries become more complicated and demanding, advanced BMS that can precisely predict SOC, SOH, and RUL are needed. Under changing operating circumstances, AI and machine learning may improve these estimations' accuracy and dependability, according to the report. The BMS's strong fault detection algorithms identify possible faults early, boosting battery system safety and lifespan. Cooling methods and materials must improve to maintain battery performance and safety. Cloud computing and IoT boost BMS capability with real-time monitoring and predictive maintenance. The paper concludes that BMS technologies must be researched and developed to meet the EV industry's growing needs, manage modern battery technologies, and contribute to sustainable transportation.

References

1.E3S Web of Conferences 591, 04001 (2024) <https://doi.org/10.1051/e3sconf/202459104001>
[ICRERA-2024](#).

2. Vidal, C., Malysz, P., Kollmeyer, P., and A. Emadi. "Machine Learning Applied to Electrified Vehicle Battery State of Charge and State of Health Estimation: State-of-the-Art." *IEEE Access*, vol. 8, 2020, pp. 52796–52814.
3. Waag, W., and D. U. Sauer. "Adaptive Estimation of the Electromotive Force of the Lithium-Ion Battery after Current Interruption for an Accurate State-of-Charge and Capacity Determination." *Applied Energy*, vol. 111, 2013, pp. 416–427.
4. Wang, Q. "Battery State of Charge Estimation Based on Multi-Model Fusion." *Chinese Automation Congress (CAC)*, 2019, pp. 2036–2041.
5. Wang, Y., Chen, Z., and C. Zhang. "On-Line Remaining Energy Prediction: A Case Study in Embedded Battery Management System." *Applied Energy*, vol. 194, 2017, pp. 688–695.

isbn 9,1

Environmental applications of Artificial intelligence

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Introduction

AI has a dual, complex relationship with the environment, acting as both a significant contributor to carbon emissions and a powerful tool for sustainability. While training and running large models demand massive energy and water for data centers, AI helps optimize energy grids, monitor climate data, and boost efficiency in critical sectors.



AI is helping tackle climate change

AI tools that predict weather, track icebergs, recycle more waste and find plastic in the ocean are helping to combat climate change. The power of artificial intelligence (AI) to process huge amounts of data and help humans make decisions is transforming industries. As one of the world's toughest challenges, combating climate change is another area where AI has transformational potential. Almost 4 billion people already live in areas highly vulnerable to climate change, according to the World Health Organization. And this is expected to lead to around 250,000 extra deaths a year between 2030 and 2050, from undernutrition, malaria, diarrhoea and heat stress alone. Here are eight ways AI is already helping to tackle climate change.

Icebergs are melting – AI knows where and how fast

AI has been trained to measure changes in icebergs 10,000 times faster than a human could do it. This will help scientists understand how much meltwater icebergs release into the ocean – a process accelerating as climate change warms the atmosphere. Scientists at the University of Leeds in the United Kingdom say their AI can map large Antarctic icebergs in satellite images in just one-hundredth of a second, reports the European Space Agency. For humans, this task is lengthy and time-consuming, and it's hard to identify icebergs amid the white of clouds and sea ice.

2. Mapping deforestation with AI

AI, satellite images and ecology expertise are also being used to map the impact of deforestation on the climate crisis. Space Intelligence, a company based in Edinburgh, Scotland, says it is working in more than 30 countries and has mapped more than 1 million hectares of land from space using satellite data. The company's technology remotely measures metrics, such as deforestation rates and how much carbon is stored in a forest.

3. AI is helping communities facing climate risks in Africa

In Africa, AI is being used in a United Nations project to help communities vulnerable to climate change in Burundi, Chad and Sudan. The IKI Project uses AI technology to help predict weather patterns, so communities and authorities can better plan how to adapt to climate change and mitigate its impact. This includes improving access to clean energy, implementing proper waste management systems and encouraging reforestation.

4. Using AI to recycle more waste

Another AI system is helping to tackle climate change by making waste management more efficient. Waste is a big producer of methane and is responsible for 16% of global greenhouse gas (GHG) emissions, according to the United States Environmental Protection Agency. Greyparrot, a software startup based in London, United Kingdom, has developed an AI system that analyzes waste processing and recycling facilities to help them recover and recycle more waste material. The company tracked 32 billion waste items across 67 waste categories in 2022, and says it identifies 86 tonnes of material on average that could be recovered but is being sent to landfill. AI is helping to fight climate change in systems, including those that identify plastic pollution in the ocean.

5. AI is cleaning up the ocean

In the Netherlands, an environmental organization called The Ocean Cleanup is using AI and other technologies to help clear plastic pollution from the ocean. AI that detects objects is helping the organization create detailed maps of ocean litter in remote locations. The ocean waste can then be gathered and removed, which is more efficient than previous cleanup methods using trawlers and aero planes.

6. AI helps predict climate disasters

In São Paulo, Brazil, a company called Sipremo is using AI to predict where and when climate disasters will occur, and what type of climate disasters they will be. The aim is to help businesses and governments better prepare for climate change and the growing challenges for communities that come with it. The company works in industries including insurance, energy, logistics and sport, where its analysis of disaster conditions and factors such as air quality can inform decisions on whether to delay or suspend events.

7. A wish list of AI climate tools

Google DeepMind, Google's AI research laboratory, says it is applying AI to help fight climate change in a number of areas. This includes building a complete wishlist of datasets that would advance global AI solutions for climate change. Google DeepMind is working on this with Climate Change AI, a non-profit organization set up by volunteers from academia and industry who see a key role for machine learning in combating climate change. Other Google AI tools are focused on improving weather forecasting and increasing the value of wind energy by better predicting the output from a wind farm.

8. How AI can help industry decarbonize

AI is being used to help companies in the metal and mining, oil, and gas industries to decarbonize their operations. Eugenie.ai, based in California, United States, has developed an emissions-tracking platform that combines satellite imagery with data from machines and processes. AI then analyzes this data to help companies track, trace and reduce their emissions by 20-30%. Industrial sectors generate around 30% of greenhouse gas emissions globally.

The potential of AI in the future

AI is one of the key emerging technologies explored in the World Economic Forum's Top 10 Emerging Technologies of 2023 report. The report specifically looks at generative AI – a type of AI that creates content including text, images and computer programming.

References

1. Russell & Norvig (2021), pp. 1–4.
2. AI set to exceed human brain power Archived 19 February 2008 at the Wayback Machine CNN.com (26 July 2006)
3. Kaplan, Andreas; Haenlein, Michael (2019). "Siri, Siri, in my hand: Who's the fairest in the land? On the interpretations, illustrations, and implications of artificial intelligence". *Business Horizons*. **62**: 15–25. doi:10.1016/j.bushor.2018.08.004.
4. Russell & Norvig (2021, 1.2).
5. "Tech companies want to build artificial general intelligence. But who decides when AGI is attained?". *AP News*. 4 April 2024. Retrieved 20 May 2025.

isbn 978- .

Environmental Threats Facing Our Planet

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Introduction

Understanding these threats is the first step towards combating them. With collective efforts and informed decisions, we can work towards a sustainable future where nature and humanity thrive side by side. Through collaboration with environmental groups and adopting greener practices, we can make significant strides in securing the well-being of our planet.

Impact of Pollution

The relentless march of **pollution** around the world has profound impacts that ripple across our planet. It's not just a local problem confined to factories or cities; pollution is a global crisis affecting every corner of the Earth. The air we breathe is tainted with harmful particles, largely resulting from emissions from vehicles and industrial activities. This multitude of invisible pollutants infiltrates our lungs, leading to respiratory diseases and a cascade of health complications. Asthma rates are climbing, with millions suffering due to poor air quality. Tragically, the World Health Organization reported that air pollution contributes to the premature deaths of around seven million people annually, a staggering statistic that underscores its seriousness.

Loss of Biodiversity

The phenomenon of **loss of biodiversity** is more than just a scientific concern; it is a pressing reality with far-reaching consequences. Biodiversity encapsulates the variety of life on Earth, encompassing every living organism, from the tiniest microbe to the largest mammal. It helps maintain ecological balance and supports life-sustaining services such as oxygen production, water purification, and pollination. However, human activity has significantly disrupted this balance, leading to a drastic decline in biodiversity. According to recent studies, species are becoming extinct at a rate hundreds of times higher than the natural background rate, a situation compounded by habitat destruction, pollution, climate change, and over-exploitation of resources. Such disruptions result in the weakening of natural systems, which in turn affects food security, health, and even the financial stability of nations.

Deforestation and Habitat Destruction

Deforestation and habitat destruction are like invisible thieves, slowly robbing the Earth of its richness. Every year, vast areas of our planet's lush forests are cleared for various reasons, including agriculture, mining, and urbanization. These activities not only strip the land of its vegetation but also disrupt the delicate balance of ecosystems. An essential consequence of this practice is the loss of biodiversity, as many species lose their homes and are pushed towards extinction. Forests, which act as the lungs of our planet, are vital in sequestering carbon dioxide, thus playing a crucial role in mitigating **climate change**. Their removal leads to increased greenhouse gases in the atmosphere, exacerbating the global warming crisis.

Steps Towards a Sustainable Future

Creating a sustainable future doesn't happen overnight—it requires a thoughtful blend of policy changes, community actions, and individual choices. One of the fundamental steps is addressing the issue of climate change with urgency. Governments around the world can enact legislation targeted at reducing carbon emissions and promoting renewable energy sources. It is crucial for nations to work collaboratively, as exemplified by the Paris Agreement, to set ambitious targets for reducing greenhouse gases. Individuals also play a pivotal role by switching to renewable energy solutions, like solar panels or wind turbines, even at a household level. These actions not only contribute to a reduction in emissions but also encourage local economies by supporting green technology industries.

The impact of **pollution**, unquestionably, calls for stricter regulations on chemical waste and emissions. Tackling air and water **pollution** is critical for safeguarding public health and preserving aquatic and terrestrial ecosystems. Encouragingly, several cities have introduced measures like green public transportation systems and bans on single-use plastics to mitigate waste. Communities embracing waste segregation and proper recycling methods effectively contribute to reduced landfill use, ultimately decreasing economic costs and ecological footprints. Indeed, behavioral economic studies suggest people are more inclined to segregate their waste adequately when provided with clear instructions and incentives.

Addressing the loss of biodiversity, we must focus on habitat conservation and restoration projects. We can effectively preserve biodiversity by establishing more protected areas and reserves, promoting reforestation, and supporting agroforestry practices. On that note, wildlife

corridors are an innovative solution allowing animals to access larger territories for food and mating, supporting genetic diversity. Substantial efforts from *future-conscious* agricultural industries to maintain sustainable farming methods, such as crop rotation and bio-pest control, not only bolster biodiversity but also enhance soil quality and yield long-term benefits for both farmers and the environment.

Conclusion

Finally, education and awareness are vital. By cultivating environmental literacy in educational systems and community forums, we empower people to take meaningful action in their everyday lives. History shows that informed individuals are likely to advocate for effective change, influencing policy, and driving sustainable innovation. Engaging youth through knowledge and opportunities for environmental stewardship will foster a generation that's both mindful and proactive, ensuring our planet's health is a priority for years to come.

Courtesy

ENVIRONMENTAL GROUPS 19 January 2025.

isbn 978-93-5759-252-2

Microbiology and artificial intelligence

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Introduction

John McCarthy proposed the field of artificial intelligence (AI) at the Dartmouth Conference in the summer of 1956. AI is concerned with modelling human intelligence's extending capabilities and developing related theoretical frameworks, methodological tools, and application systems (Jiang et al., 2022). Alan Turing, creator of the Turing test used to distinguish between humans and machines, had previously highlighted concerns about the prospect of machines mimicking human behaviour and thought. Since then, advances in computing power have made it possible to perform computations in a flash and to compare new data with older data that has already been evaluated (Mintz & Brodie, 2019). Over several decades, AI has progressed from using simple codes to increasingly complicated algorithms with human-like capabilities (Kaul et al., 2020). Personal assistants (Siri, Alexa, Google Assistant, etc.), automated public transport, aviation, and computer games are just a few examples of how AI has made its way into our everyday lives today (Mintz & Brodie, 2019). Machine learning, deep learning, and computer vision are just a few of the many subfields within artificial intelligence.

Applications And Challenges Of Ai In Microbiology Laboratory

Understanding images is essential for clinical microbiology laboratory diagnostics. For example, Gram stains, faecal and blood smears, and histopathologic slides require the interpretation of expert microbiologists and pathologists. Important diagnostic information, such as the types of microorganisms present, the host's inflammatory response, and the quality of the material, can be gleaned from these samples. When viewed in a clinical context, this information is crucial for confirming the presence of an infection and often provides clues for a potential differential diagnosis that guides appropriate therapy. The clinical microbiology laboratory faces an extra challenge due to a persistent shortage of medical laboratory scientists. To address this issue, there

is growing interest in automating visually demanding interpretative tasks within the workflow. Until recently, previous attempts at automating image-based interpretative tasks were not satisfactory. However, the emergence of advanced AI algorithms capable of superior image discrimination has paved the way for automated clinical microbiology interpretation. This advancement promises to improve efficiency and diagnostic accuracy significantly.

Conclusion

In summary, integrating AI with microbiology can fundamentally transform our comprehension of the microbial realm and its crucial contribution to preserving life on our planet. In the current epoch of significant change, it is imperative to prioritise the cultivation of conscientious and principled utilisation of AI to fully exploit its capacity for advancing the welfare of mankind and the environment. By using the potential of AI to address microbiological concerns, a future can be envisioned where in the control of infectious illnesses is improved, tailored medicine becomes the prevailing approach, and attainable solutions to environmental issues are realised. The expedition is in its nascent stages, with the most favourable outcomes still on the horizon.

References

1. Jiang, Y., Luo, J., Huang, D., Liu, Y., & Li, D. D. (2022). Machine learning advances in microbiology: A review of methods and applications. *Frontiers in Microbiology*, 13, 925454.
2. Mintz, Y., & Brodie, R. (2019). Introduction to artificial intelligence in medicine. *Minimally Invasive Therapy & Allied Technologies*, 28(2), 73-81.
3. Kaul, V., Enslin, S., & Gross, S. A. (2020). History of artificial intelligence in medicine. *Gastrointestinal endoscopy*, 92(4), 807-812.
4. Jordan M. I., Mitchell T. M. (2015). Machine learning: trends, perspectives, and prospects. *Science* 349, 255–260.
5. Domingos P. (2012). A few useful things to know about machine learning. *Commun. ACM* 55, 78–87.



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