This study examined the possible research directions and obstacles around artificial intelligence (AI) in education by doing a content analysis of publications that sought to reveal how AI has been used in the field. A total of 100 publications were chosen from the Social Sciences Citation Index database's education and educational research category between 2010 and 2020. Of these, 63 empirical papers (74 studies) and 37 analytical papers were included. According to the content analysis, the research questions fall into three categories: integration layer (affection computing, role-playing, immersive learning, and gamification), application layer (feedback, reasoning, and adaptive learning), and development layer (classification, matching, recommendation, and deep learning). In addition, an evaluation of AI in education and four research themes—Internet of Things, swarm intelligence, deep learning, and neuroscience—were recommended for more study. But we also suggested that the problems in education may be brought on by AI in terms of improper use of AI methods, shifting teacher and student roles, and ethical and societal concerns. The findings offer an overview of the field of artificial intelligence (AI) in education, which contributes to the theoretical underpinnings of AI in education and offers educators and AI developers a viable avenue for future cooperative study.

Artificial intelligence (AI) is growing and finding applications at a startling rate; it is already a part of our everyday life. In actuality, artificial intelligence has altered how individuals learn. Its implementation in the educational field has been fraught with difficulties and moral dilemmas, nevertheless. This study aims to examine the potential applications, advantages, and difficulties of AI in education. Using the systematic review approach, a comprehensive analysis of pertinent and already accessible literature was conducted in order to determine the present area of study, provide educators a thorough grasp of AI technology in the classroom, and suggest future lines of inquiry. The implementation of AI in education has evolved in industrialized nations, according to the findings, and the majority of the study gained popularity during the Industry 4.0 period. The report discusses further issues as well as suggestions.

Over 30 nations have published national artificial intelligence (AI) policy strategies as of 2021. These publications usually address the social and ethical aspects of AI and lay forth plans and expectations for how it will affect policy areas, including education. This essay reviews the importance of education in the global AI policy debate while conducting a thematic analysis of 24 such national AI policy plans. It reveals that policy discussions mainly ignore the use of artificial intelligence (AI) in education (AIED), but they heavily emphasize the need of education in producing a workforce prepared for AI and in producing more AI specialists. Furthermore, despite the importance of AI ethics debate generally in these texts, little emphasis is paid to the ethical implications of AIED. As this essay shows, successful policy and thorough examination of ethics are intimately connected. This implies that AIED and its larger policy and ethical implications—good or bad—have failed to penetrate popular consciousness and the agendas of important decision-makers. The paper uses a framework of five AI ethical principles to examine how policymakers may better take AIED's implications into account in light of these findings. In order to influence policy decisions for the public benefit, the paper concludes by providing advice for AIED scholars on how to participate in the policymaking process and conduct ethical and policy-focused AIED research.

Methods: This review article's narrative synthesis and systematic literature review were carried out. The literature and data came from a variety of sources, including EBSCO, Google Scholar, Scopus, Web of Science, and ScienceDirect books and research papers. Studies that provided a clear definition of artificial intelligence in the field of education, were published, written in English, and underwent peer review were the requirements for inclusion. In order to summarize and publish the findings, five impartial reviewers evaluated search results, gathered data, and set the research' quality. The outcome was that artificial intelligence has already permeated the field of education. An important and strategic component of educational progress is the use of artificial intelligence. Additionally, the usage of artificial intelligence as a digital assistant is growing. They support educators and learners in many ways, one of which is by providing students with an extensive library of educational resources tailored to their individual disciplines and learning requirements. Yet, there are some hazards connected to the development of artificial intelligence, including worries about privacy, security, and safety. Conclusion: Artificial intelligence technologies have both good and bad effects on education. As a result, they have an impact on the education sector in both positive and harmful ways. Artificial intelligence must thus be given top priority in education, and suitable methods must be put in place to satisfy the demands and expectations of both instructors and students through the use of AI technology. Academic performance will therefore be outstanding. Recommendation & Implication: To offer additional clarifications and precise conclusions, qualitative research—such as interviews—or quantitative analysis—such as online questionnaires—may be created in the future. The implications might help educators, administrators, and students better comprehend and put into practice effective techniques to use AI to improve student performance in the classroom.

The world is changing significantly due to artificial intelligence (AI); although there are undoubtedly positive effects from the technology, there may also be broad and long-lasting negative effects. AI is being incorporated into many facets of human life, and the complicated ethical issues that have arisen from its development, application, and use serve as a reminder that it is time to review the AI-related lessons that professionals and upcoming developers and designers are learning. It is crucial to prepare upcoming AI community members and other stakeholders to consider how AI could affect people's lives and to accept their responsibility to maximize its advantages while minimizing its possible drawbacks. This may happen in part as a result of AI ethics being taught in the curriculum in a more thorough and organized manner. In this work, we provide an overview of several perspectives on AI ethics and provide a set of suggestions for AI ethics education.

Precision education is a new problem when combining artificial intelligence (AI), machine learning, and learning analytics to improve teaching quality and learning performance, as discussed by Stephen Yang in his ICCE 2019 keynote lecture (Yang, 2019). According to Lu et al. (2018), the purpose of precision education is to promptly identify students who are at-risk and offer them interventions based on their teaching and learning experiences. This special issue, which draws on the central idea of precision education, promotes a thorough discussion between cold technology and warm humanity in order to advance knowledge of precision education. Thirteen research papers specializing in machine learning, learning analytics, AI, and precision education were exchanged for this special issue in order to gain a deeper understanding of the application of AI in education. The papers covered a wide range of applications, methods, pedagogical models, and environments.

The number of published research in the topic has expanded in tandem with the growing usage of Artificial Intelligence (AI) technology in education. Nevertheless, no extensive evaluations that thoroughly examine the several facets of this topic have been carried out. We use topic-based bibliometrics to address this gap by identifying trends and issues relevant to AI applications in education (AIEd) based on 4,519 articles from 2000 to 2019. Based on the review's findings, the academic community is becoming more and more interested in applying AI in education. Personalized learning recommender systems, natural language processing for language education, educational robots for AI education, intelligent tutoring systems for special education, educational data mining for performance prediction, discourse analysis in computer-supported collaborative learning, neural networks for teaching evaluation, and affective computing for learner emotion detection are among the main research topics. We also talk about AIEd's future directions and obstacles.

This paper presents five major points of contention that require further consideration in future discussions and decision-making on artificial intelligence in education, in light of the rapidly expanding public, governmental, and professional debates on the subject. Among these are: (1) being cautious to concentrate on concerns about "actually existing" AI rather than the overhype of speculative AI technologies; (2) emphasizing the limitations of AI in terms of modeling social contexts and simulating human intelligence, autonomy, and emotions; (3) highlighting the negative social effects of AI use; (4) recognizing that claims about AI are motivated by values; and (5) keeping a closer eye on the ecological and environmental sustainability of AI development and application. Therefore, the case is made for addressing the continued use of AI in education as a political activity that has varied effects on diverse groups of people in various educational contexts, in contrast to common views of AI as a neutral instrument.

To stay abreast of the most recent technical advancements and adapt to the shifting demands of the engineering industry, engineering education is always changing. The application of generative artificial intelligence technologies, such the ChatGPT conversational agent, is one exciting advancement in this sector. Through the creation of realistic virtual simulations for hands-on learning and the provision of tailored feedback and explanations to students, ChatGPT has the potential to provide individualized and successful learning experiences. It's crucial to take into account this technology's limits, though. Because ChatGPT and other generative AI systems rely on their training data, they run the risk of creating and disseminating false information or perpetuating prejudices. Furthermore, there are ethical questions raised by the use of generative AI in education, including the possibility of students using it unethically or dishonestly and the possibility of job losses for those whose jobs are replaced by technology. Although ChatGPT represents an outstanding but imperfect state of generative AI technology today, it is but a taste of things to come. To ensure that the upcoming generation of engineers can maximize the positive effects of generative AI while minimizing its drawbacks, it is imperative that engineering educators comprehend the implications of this technology and research ways to modify the engineering education ecosystem.

A lot of industries, including education, are fast changing due to artificial intelligence (AI). Artificial Intelligence is being applied to school administration to improve student results, optimize the learning process, and expedite administrative duties. This study is to investigate the advantages and difficulties of using AI in educational administration. Using a systematic review technique, the research project looks at the literature on artificial intelligence in educational management. According to the study, artificial intelligence (AI) provides a number of benefits, including increased student engagement, cost effectiveness, and customization of learning. AI, however, also presents a number of difficulties, including the requirement to retrain the workforce, possible biases, and ethical issues. The study comes to the conclusion that while AI has a great deal of potential to enhance school management, its use must be done so carefully.

The smart vision effort represents a paradigm change in the diagnosis and treatment of diabetic retinopathy by utilizing artificial intelligence (AI) to its transformational potential. This initiative's main goal is to treat diabetic retinopathy in all of its manifestations by utilizing state-of-the-art AI methods like deep neural networks and machine learning. By seeing complex patterns that are unseen to the human eye, these cutting-edge algorithms enable quick treatments to avoid vision deterioration. They are made for accurate and quick diagnosis. By recognizing intricate patterns that remain undetectable to the naked eye, these algorithms provide prompt and precise diagnosis. Early identification is essential because it enables prompt treatment, greatly lowering the chance of permanent vision loss. The smart vision program offers patients with diabetic retinopathy a safer, clearer, and brighter visual future by laying the groundwork for a time when the condition will not cause blindness.

The use of computer vision (CV) and artificial intelligence (AI) has the potential to drastically alter the delivery of healthcare. Applications for AI-enhanced computer vision include illness identification, patient health monitoring, medical image analysis, surgical support, accelerating drug development, and developing customized treatment plans. Using AI-assisted computer vision in healthcare can lead to better patient outcomes, faster drug development, more accurate diagnosis, reduced costs, and individualized therapy. Nonetheless, the utilization of these technologies poses challenges with data privacy, prejudice, and legal issues. This chapter covers the types of computer vision used in healthcare systems, such as behavioral analysis, medicine discovery, movement and gait analysis, medical picture analysis, and illness diagnosis. The chapter also discusses the challenges of using computer vision in healthcare, such as the complexity of biological systems, prejudice, data privacy issues, accessibility issues, and legal issues. All things considered, AI-assisted computer vision has great potential to transform healthcare systems by improving patient outcomes, enabling faster and more accurate diagnosis, and reducing costs. It is imperative to address the challenges surrounding these technologies in order to ensure that they are used in an ethical and responsible manner.

For many different countries, agriculture is the most important and principal source of domestic revenue. The sickness that many pathogens, including bacteria, fungi, and viruses, cause in plants may cost agribusiness corporations a significant amount of money every year. Plant disease monitoring depends heavily on the security of crops in terms of both quantity and quality. Identifying plant diseases is so crucial. There are certain plant portions where the plant disease condition is apparent. However, the infection is typically seen on different plant leaves. Many researchers use techniques such as computer vision, deep learning, few-shot learning, and soft computing to automatically diagnose plant diseases from leaf photos. These methods also help farmers take prompt and appropriate action to prevent a decline in crop quality and quantity. By carefully choosing and extracting information from the disease, these strategies may be applied to recognize diseases and mitigate their origin-related disadvantages while also accelerating technological advancement and research efficiency. Additionally, specific molecular methods have been developed to lessen and minimize the damage posed by pathogens. As a result, this study offers specific diagnosis strategies to assist avoid illness and aids in the automatic detection of plant disease utilizing machine learning, deep learning, and few shot learning. Additionally, a few upcoming projects pertaining to illness categorization are also included.

Artificial intelligence (AI) technology covers a broad range of fields. AI-based technologies, both cooperative and individual, are widely available. Computer vision technology is one of them. Artificial neural networks, deep learning, machine learning, and other technologies are also connected to computer vision. Applications for computer vision may be found in many fields. The healthcare industry is one of the fields where it has been extensively used recently. Different algorithms from the aforementioned technologies are employed in the healthcare industry to extract valuable information from medical photos. This chapter provides an overview of computer vision, including its definition, domains of use, and use in healthcare. Additionally, a MATLAB environment example of computer vision-based tumor identification is taken into consideration.

For material analysis, inverse gas chromatography (IGC) has shown to be an extremely sensitive, flexible, and useful technique. IGC offers critical insight into material physicochemical data, including dispersive surface free energy, Gibbs surface energy components, and Guttamann Lewis acid-base parameters, by utilizing thermochemical techniques. We explore the instrumentation, history, and many applications of IGC in this extensive overview. The selection and description of many models used in IGC studies are described in detail, providing researchers and practitioners with useful information. IGC is used in many different fields, such as nanomaterials, minerals, polymers, medications, and surfactants. Moreover, IGC makes it easier to assess critical characteristics such surface heterogeneity, miscibility, solubility parameters, specific surface area, co/adhesion work, sorption enthalpy and entropy, and surface energy components (dispersive and specific). These discoveries expand our knowledge of material behavior and help in the development and improvement of cutting-edge materials. Furthermore, our comprehension of the complex surface texture, roughness, and associated attributes of materials has improved with the integration of IGC with computer vision and image processing techniques. The combination of artificial intelligence (AI) and computer vision with IGC opens up new and intriguing possibilities for chemical material development in the future. This study presents the synergistic potential of merging IGC with AI and computer vision, in addition to offering a thorough introduction of IGC, its methods, and applications. Researchers, scientists, and other experts working in the field of advanced materials will find value in the insightful information and insights offered here, which will empower them to use IGC and AI to discover and create novel materials.

The use of artificial intelligence (AI) in smart homes, industrial control, and other domains is now meeting with positive reception. However, network security, data analysis, human-computer interaction, and other areas are problematic for AI technology, and it also has specific needs for computer performance. Although the visual platform of embedded systems has now produced impressive achievements in real-world applications, issues like inconsistent system performance and low overall development efficiency have severely impeded its progress. Based on AI technology, an EP Vision System (VS) was created in this work. The platform realized the intelligent robot interaction and target identification features by combining the Support Vector Machine (SVM) algorithm with integrated hardware architecture. According to the test findings, professionals and students had different opinions about System X: 16.5% and 10% thought it was unfavorable, and 83.5% and 90% thought it was positive under the same circumstances. However, just 19% and 4% of them gave System Y a favorable review, whilst 81% and 96% gave it a bad evaluation. Indicating that System X may somewhat increase the system recognition efficiency and satisfy the real application requirements, the percentage of favorable evaluations for System X was much greater than that of System Y. It demonstrated the beneficial connection between EP VS and AI technologies.

fitted into contemporary clever automobiles. Numerous foundation models based on artificial intelligence have been put forth for smart sensing, which recognizes recognized item classes in novel but comparable settings. Nevertheless, detecting all the item classes in both seen and unseen contexts remains a challenge for the foundation models of smart sensing. The goal of this letter is to advance the field of smart sensing for intelligent cars. First, we provide an overview of the foundation models that are now in widespread use and the foundation intelligence required for intelligent vehicle smart sensing. Next, in order to advance the foundation models of smart sensing from basic intelligence (1.0) to enhanced intelligence (2.0) and ultimately generalized intelligence (3.0), we describe Sora-based Parallel Vision. A number of illustrative case examples are presented to illustrate the possible applications of Sora-based Parallel Vision, and then the direction of future research is addressed.

The use of AI and machine learning, namely the vision transformer approach, in bacterial detection offers a promising way to get beyond the drawbacks of conventional techniques and provide quicker and more accurate identification of bacteria that cause disease, such as E. Water containing E. Coli and Salmonella is essential for human existence, and studies are still being conducted to determine its efficacy in microbiology. In order to classify bacterial colonies, this study presents a novel positional self-attention transformer model. By adding a positional self-attention mechanism, we improved the model's performance by utilizing the transformer designs' shown effectiveness across a range of domains. We introduced a new method for classifying bacterial colonies using a positional self-attention transformer model. This contributes to extremely precise classification findings by enabling the algorithm to grasp spatial linkages and patterns within bacterial colonies. We ensured the model's resilience and its ability to generalize to different types of colonies by training it on a large dataset of bacterial pictures. More precise and reliable categorization was made possible by the suggested model's deft capturing of the spatial linkages and sequential patterns present in photos of bacterial colonies. The model that was suggested performed remarkably well, classifying bacterial colonies with an accuracy of 98.50%. This new method outperforms existing techniques by accurately capturing complex spatial interactions within microbial structures and provides previously unheard-of precision in identifying minute morphological differences. The model's capacity to adapt to various colony forms and arrangements is a noteworthy development that might revolutionize the field of bacterial colony categorization by utilizing cutting-edge deep learning approaches. The model's excellent classification accuracy indicates that it may find use in the early detection of infectious illnesses and the creation of focused therapies. The results of this work highlight how positional self-attention may be effectively included into transformer models for image-based classification tasks, especially in the field of bacterial colony analysis.

A typical high-tech comprehensive application is an autonomous vehicle, which uses technologies such as computer vision, sensors, information fusion, information communication, high-performance computing, artificial intelligence, automatic control, and others to perform tasks like scene perception, optimization calculations, multi-level assisted driving, and other tasks. In these technologies, computer vision plays a crucial role in autonomous driving as a direct input point to data processing. Secondly, it introduces innovative modifications to the transportation system of the future. Intelligent decision-making and control in autonomous driving are made possible in large part by the use of image processing and computer vision in the vehicle's perception and understanding of its surroundings. This paper explains image processing technology in automatic driving, including camera and sensor technology, image acquisition and preprocessing, feature extraction, and object detection, in order to discuss the application of computer vision algorithms in automatic driving. This is done in addition to the application of computer vision and artificial intelligence in automated driving. Research on traffic signal and sign recognition, obstacle detection and avoidance, and lane maintaining and recognition is extremely important from a practical standpoint.

In computer vision, medical picture segmentation is an essential process that is critical to applications like treatment planning, diagnosis, and medical research. This study investigates a variety of techniques used in the field of medical research to accomplish picture segmentation. These methods span the gamut of contemporary artificial intelligence techniques, including deep learning techniques, to more conventional approaches based on thresholding, edge detection, region-based, and clustering. Every method's advantages and disadvantages are carefully considered. In particular, the performance of many architectures utilized for medical picture segmentation is analyzed and evaluated in this article. It seeks to provide a comparative analysis of the various segmentation techniques by delving deeper into them. Additionally, this paper explores the latest developments in segmentation technology, highlighting significant advances that have the potential to revolutionize the accuracy and efficiency of medical image analysis. By means of a thorough synthesis and critical evaluation of the outcomes attained by utilizing a variety of segmentation techniques, the research offers the results of several methods along with a comprehensive examination of the advantages and disadvantages of the different approaches used in medical image segmentation. The understanding of these techniques' potential applications in the medical field—particularly in the field of computer vision—is improved by this study.

This article presents a study that uses computer vision algorithms and artificial intelligence (AI) to identify human emotions in video recordings as users interact with various visual stimuli. The goal of the project is to demonstrate how artificial intelligence (AI) algorithms and image processing pipelines may be used to detect emotions in software. The procedure entails evaluating individuals via photos and enabling computer vision algorithms that are in line with psychological theories that describe emotions and their distinguishable characteristics. The study shows that software creation and training based on facial expressions, together with the use of convolutional neural networks (CNNs) for emotion identification, are feasible. The outcomes show that emotion recognition is successful; however, more training for settings with a wider range of picture types and additional algorithms to discern closely related emotional patterns are required for accuracy improvement. The promise of AI is emphasized in the debate and conclusions. Using computer vision algorithms in the identification of emotions, offering perceptions into the creation of software, continuous training, and the changing field of emotion recognition technology. In order to improve confidence and accuracy, new algorithms that can discriminate between facial expressions that portray closely comparable emotional patterns will need to be developed and trained for situations with a wider variety of pictures.

The most important component of the human body, the face is vital for distinguishing individuals due to its unique characteristics. One of the most intriguing and successful technologies of the contemporary era is facial recognition technology (FRT). Following the COVID-19 outbreak, contactless FRT is becoming more and more common. Because of its contactless biometric features, FRT is gaining a lot of traction globally. Artificial intelligence-based FRT is taking the place of traditional fingerprint scanners in businesses, creating a plethora of new business opportunities. Its usage has grown indispensable in a number of industries, including digital healthcare, security and surveillance, access control systems, and photo retrieval. In this message, we discussed the widespread use of FRT, its growing commercial trend, its use in several industries, its difficulties, and growing worries, with particular attention to India and the rest of the globe.

With the help of recent technical advancements, computers are now able to recognize and classify facial expressions in order to ascertain an individual's emotional state from a picture or video. The procedure known as "Facial Expression Recognition (FER)" has grown to be one of the most well-liked computer vision research topics. Recent work on deep FER systems has mainly focused on two major issues: overfitting as a result of scarce training data, and expression-unrelated variables such as lighting, head posture, picture quality, and identification bias. This work presents a thorough assessment of deep FER, covering datasets and techniques that provide light on these fundamental issues. First, this work provides an extensive chronology illustrating the development of techniques and datasets for deep facial expression recognition (FER). This timeline shows how the methods and data sources employed in FER have evolved and progressed. After that, a thorough analysis of FER methods is presented, covering everything from the fundamentals of FER (e.g., preprocessing, feature extraction and classification, and methods) to the shift from pro-deep learning (i.e., handcrafted feature-based methods like SVM and HOG) to the deep learning era. Additionally, a brief overview of the benchmark datasets—of which there are two categories: controlled settings (lab) and uncontrolled environments (wild)—that are used to compare and assess various FER models and methodologies is given. We cover current deep neural networks and associated FER-specific training approaches using both static and dynamic picture sequences. Additionally identified are the potential and obstacles that still exist in FER as well as the future paths for creating reliable deep FER systems.

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In computer vision, facial recognition is a well-established and well-liked area, especially with advances in deep learning and large data sets. With considerable advancements, deep face recognition is now routinely used in practical situations. Three key parts make up a full facial recognition system: representation, orientation, and facial recognition. This method uses deep convolutional neural networks to identify faces, align them to a standard perspective, and extract features for recognition. This article gives a thorough summary of the most recent developments in these fields, demonstrating how deep learning has significantly improved their capabilities. Machine vision object identification is a difficult field that needs a lot of advancements. Despite the fact that object identification algorithms are still in their infancy, picture classification accuracy is approaching 2.25%, which exceeds human performance. On contemporary objects, current methods only obtain 40.8 MAPS; hence, careful dataset selection is essential for best outcomes.

Several artificial intelligence (AI)-based technologies were employed during the COVID-19 pandemic to manage the virus's transmission, including facial recognition technology (FRT). This device is envisioned as an effective tool to follow sick persons and gather real-time surveillance data, as preparations are being made for potential pandemics in the future. FRT presents certain ethical and legal challenges, such as its use without ensuring consent from the individuals under surveillance, the protection of biometric data collected through surveillance, and the risk of using this information for purposes other than public health. When used properly, FRT can support governments' strategies to implement public health surveillance, which is defined in the literature as "the systematic collection, storage, usage, and dissemination of personal information to identify an outbreak and mitigate the spread of disease." Even while it is extensively used in nations like China and Russia for pandemic preparedness for other reasons, western jurisdictions are far less likely to embrace it.

A critical problem arose in Delhi, India, during the COVID-19 pandemic: almost 1,500 patients who tested positive for the virus vanished. Hospital management finds it challenging to keep track of patients during public health emergencies, such as pandemics, natural disasters, or other calamities, when there is a sudden surge in patient volume. This is particularly true when patients need to be transferred between facilities or when new temporary healthcare facilities need to be established. These difficulties may lead to a rise in situations involving missing persons. Unintentionally separating patients from their relatives is a possibility. The human face is a special kind of biometric information that may be used to verify identify and detect an individual's age, gender, and even mood. Patient identification is a critical application of computer vision that harnesses the potential of artificial intelligence and deep learning. In this study, we have proposed a state-of-the-art patient face detection model using a twofold model that uses FaceNet Convolutional Neural Network (CNN), a well-known face embedding algorithm, as a face embedding algorithm and MTCNN, short for "multi-task cascaded convolution neural network," for face detection and alignment purposes. Finally, we use KNN algorithm as a classifier to get an accuracy of 97.1%. Additionally, in order to guarantee public safety during the pandemic, we have established a 97% accurate Resnet34 mask identification model, which was trained on the Face Mask identification dataset. This work has ramifications for wider healthcare applications in addition to addressing the pressing issues of patient identification and safety in emergency situations. The suggested approaches present viable ways to improve security and patient care.

One of the cornerstones of positive psychology is well-being, which is well-known to have good impacts on people's personal and professional life as well as on teams and organizations. Staff health and long-term success depend on understanding and promoting individual well-being, but the methods currently in use to measure subjective well-being are laborious surveys and questionnaires that make it difficult to provide the kind of immediate feedback that is necessary to shift individual behavior and raise awareness. In order to find important determinants of individual well-being in cooperation, this research uses video data to present a framework for understanding the process of nonverbal communication in teamwork. It uses cutting-edge artificial intelligence techniques in conjunction with video capture technology to extract individual, relative, and environmental features from panoramic video. Each time series is subjected to statistical analysis, producing a dataset of 125 variables. These features are then connected to questionnaires known as PERMA (Positive Emotion, Engagement, Relationships, Meaning, and Accomplishments), which were created within the framework of positive psychology. Using machine learning methods, each pillar of the PERMA model is assessed as a regression or classification issue. Our method was used in a case study where 80 students worked together in 20 teams for a week in person on a team project. This made it possible for us to develop a number of theories about the variables affecting each person's well-being while working in a team. These encouraging findings suggest intriguing study directions, such as merging various media to analyze teamwork-related individual well-being.

Face recognition is crucial for many applications, including security, monitoring, and identity verification. The majority of homes have CC cameras installed so they can identify people from them for safety reasons. The purpose of these CCTVs is to keep people secure and track visitors to their homes. In a select few, highly guarded locations where it is totally forbidden to admit any unknown invader. Therefore, the topic of this research is a system that uses machine learning and artificial intelligence (AI) algorithms to identify an intruder's face from a surveillance camera. Using HOG feature extraction and SVM classification methods, the design is effectively executed, classifying the faces in an input video stream. This paper's main goal is to use a HOG feature extractor to identify faces from a video, categorize those faces using support vector machines (SVMs), and train the system to distinguish between intruders and employees.

In addition to expanding the population, a bigger consumer base means more work and resources are required to meet the demands of these ever growing numbers of customers. Why not this one? After all, technology is employed to fix all of the issues. The goal is to provide a more sophisticated and convenient super market experience where customers may purchase without fuss and without having to wait in line or see cashiers. In order to automate a supermarket and increase productivity, this project makes use of artificial intelligence and the internet of things. After scanning their QR code via the smartphone bearing their unique ID, a person only has to go in. It will keep track of the customer's arrival at the store. Sensors on the shopping carts and baskets allow them to recognize when a product is being put in or removed. The goods are arranged on shelves equipped with pressure sensors, which sense when a product is lifted. Your shopping cards are the only way to unlock these restricted shelves. All you have to do is swipe your card once again at the counter to get money taken out of your account in accordance with what you bought, and you'll receive a receipt. With a small one-time investment, we want to supply this technology to several super market chains both domestically and outside.

Future transportation networks are anticipated to be drastically altered by autonomous vehicles (AVs), and one of the key components of high-level automated driving is decision-making. Data-driven decision-making techniques have drawn increased attention in an effort to handle those complex situations that rule-based systems were unable to adequately handle. A thorough understanding of the current datasets is therefore required, as they have a significant impact on the performance of decision making when utilized to construct data-driven techniques. Driving data may be categorized into three categories based on the sources from which it was collected: vehicle, environment, and driver. This study outlines the aspects, such as driving situations, annotation, and sensors employed, and compares the state-of-the-art datasets of these three categories. This survey also addresses prospective uses of datasets on different AV decision making elements based on the datasets' properties, helping academics choose relevant datasets to support their own work. A summary of the AV dataset development's future patterns is provided.

Nonetheless, it is generally believed that accurate trajectory tracking will make motion planning algorithm design easier, even if this is not practical in real-world situations. By coordinating the motion planning layer and controller, a secure and dependable framework for motion planning and control is presented in this research to address tracking problems resulting from imprecise tracking. In particular, the repulsive potential field is constructed by constructing the movement constraint size based on tracking error, dividing motion space into safe and dangerous zones. The suggested waypoint set filtering technique combined with global search can then yield the collision-free waypoint set. An optimization-based method that reduces the reference trajectory's acceleration is used to suit the planned trajectory. The intended course is then examined and adjusted by the anti-collision modification to guarantee safety. Even in the event of actuator failures, transient trajectory tracking errors may be kept within the intended region by employing invertible transformation and adaptive compensation. Under incorrect tracking and actuator problems, safety and reliability may be ensured by the coordination between the planning and control levels because tracking error is taken into account and margined at the planning level. Simulation and experimental findings validate the benefits and efficacy of the suggested motion planning and control system.

In regular traffic, how would individuals divide the risks associated with autonomous vehicles (AVs)? The extensive body of research on the morality of autonomous vehicles (AVs) centers on moral assessments of situations in which collisions are inevitable. We make the case for expanding the discussion to driving practices in regular traffic situations, where ethical dilemmas are constantly raised by the ongoing transfer of risk among users. We measured participants' preferences on driving maneuvers of AVs in a representative survey in Germany using an interactive, graphical representation of different traffic situations. This distribution of risks raises ethically relevant questions that cannot be avoided by simple heuristics like "hitting the brakes." The choices of our participants were far from just avoiding collisions. It's interesting to note that our participants were prepared to assume personal risks in order to help other drivers, which implies that the social conundrum raised by AVs may be lessened in hazardous situations. Through our study, engineers and philosophers may be able to have more fruitful conversations on the ethics of autonomous vehicles.

One of the newest technologies is artificial intelligence, which trains robots to think and behave like humans in order to emulate human intellect. An autonomous automobile is capable of operating on its own and performing essential tasks without the need for human intervention. With the use of this cutting-edge technology, there may be improvements in travel experiences, less traffic, less pollution, fewer clogged roads, and optimal traffic flow. In the fields of industry, agriculture, transportation, and military applications, autonomous vehicles are essential. A few artificial intelligence algorithms and sensor data assist the autonomous car in its operations. Data collecting, path planning, and execution in autonomous vehicles—all of which need for certain machine learning techniques—are examples of artificial intelligence. However, there are certain security and privacy risks associated with this. One major problem with autonomous cars is security. This article will discuss the developing field of self-driving car technology as well as the cybersecurity concerns associated with integrating artificial intelligence.

The need for modern logistics and urban mobility has led to a steady growth in the number of cars on the road over the past several decades. Increased traffic congestion and traffic accidents are two of the numerous negative repercussions of additional automobiles on the road, which also limit economic progress. By lowering the dependency of automobiles on people, intelligent cars might greatly alleviate the aforementioned problems. Road vehicle automation has been spurred by substantial research undertaken by several nations over the past century. Every major motor manufacturer in the world is now working on developing autonomous vehicle (AV) technology. Undoubtedly, with the advancements in artificial intelligence (AI), the widespread deployment of driverless automobiles is closer than we may think. AI has become a critical component for autonomous vehicles (AVs) to enable them to sense their environment and make appropriate judgments in real time. The proliferation of big data from several sensing devices and state-of-the-art computational capabilities is propelling the development of AI. To understand AI's roles in AV systems, we must first look at its evolution and past.

The fourth industrial revolution and the advancement of artificial intelligence (AI) will have a significant impact on the sustainability of the global automobile sector in the future. New industry standards such as more advanced self-driving technology, updated safety regulations, more intricate insurance policies, social resistance to technological change adapting to city infrastructure requirements with a digital divide, and disruptive business innovation based on strategic input supply partnerships with open-source AI are expected to drive the "new normal." This chapter examines the major components of autonomous vehicles (AVs) employing artificial intelligence (AI) advancements in radar and laser technology, commercial risk considerations, consumer behavior that drives itself, limitations imposed by municipal infrastructure, and societal adjustments to new technology. It is anticipated that the commercial, social, risk, infrastructure, and regulatory processes would interact in the future trajectory of the AV business, resulting in diverse effects on industry stakeholders. The findings of this study indicate that the following scenarios are most likely to sustain the AV industry: (1) AI-powered pulsed laser LiDAR (Light Detection and Ranging) with a sufficient loop frequency and GPS bi-directional cloud technology requirement; (2) pooled insurance as opposed to individual liability; (3) smart city infrastructure with an anticipated sharp digital divide across transport regions that will increase regional inequality; and (4) customers who strongly prefer a human-driven semi-autonomous vehicle over one driven entirely by machines.

The combination of sophisticated AI capabilities and human-centric design will determine the direction of autonomous cars in the future. In the future, autonomous cars will not only carry people, but will also communicate with them and adjust to their needs, resulting in a more efficient, enjoyable, and comfortable ride. In this study, we provide a novel framework to improve the decision-making process of autonomous cars by utilizing Large Language Models (LLMs). This framework aims to seamlessly integrate the advanced language and reasoning capabilities of LLMs into autonomous vehicles by integrating their natural language abilities and contextual understanding, using specialized tools, synergizing reasoning, and acting with various modules on autonomous vehicles. By providing individualized support, ongoing learning, and transparent decision-making, the suggested framework has the potential to completely transform how autonomous cars function and eventually lead to the development of safer and more effective autonomous driving technology.

There are many different aspects to the possibility for linked automated cars, and automated progress focuses on increasing the growth of the Internet of Things (IoTs) to facilitate artificial intelligence (AI). AI has been influenced by early developments in engineering, electronics, and many other domains. Numerous technological suggestions have been made for autonomous cars. Automated cars play a major role in reducing casualties and optimizing traffic. There are two types of development possible when it comes to investigating vehicle autonomy: one is backward subsystem progress, such as sensor and information processing systems, and the other involves high-level system integrations, such as new-energy cars and intelligent transportation systems. The outcomes of the Advanced Driver Assistance System are up to par with real-world automotive autonomous issues. Large-scale data collection from situational intelligence is taken into account while producing high-definition city maps, surveying land, and evaluating the state of roadways. With the aid of a camera, Light Detection and Ranging (LiDAR), Radio Detection and Ranging (RADAR), and localization of the objects in the scene, the transport's infotainment system facilitates the driver's gesture recognition, language exchange, and perception of the surroundings. This chapter covers the background of autonomous vehicles (AV), current research topics in AV artificial intelligence technology, cutting edge datasets utilized in AV studies, and various ML/DL algorithms that make up the system's operation. It ends with the opportunities and challenges of AI in AV.

With technology becoming a crucial part of every day life, artificial intelligence is now required for both production and service systems. Autonomously operating vehicles, sometimes referred to as driverless automobiles, function without the need for human intervention. Recent years have seen significant advancements in the field of autonomous vehicle research. The modern civilization requires autonomous automobiles with artificial intelligence. Despite the fact that some individuals might be reluctant to hand over control of their car to a computer, automated driving technologies have the potential to increase road safety. Both safety-related and environmental concerns may be handled by self-driving cars. Computers, in contrast to humans, do not truly struggle with maintaining focus when operating a vehicle. Furthermore, an autonomous vehicle can avert collisions in reaction to potentially hazardous roadside situations by reacting correctly. One benefit of self-driving technology is that it will make transportation for those who are unable to drive easier to obtain. Many people are incapable of operating a car due to a number of factors, including age, infirmity, or lack of expertise. These people are able to move far more freely and safely. Thus, in this chapter, we will examine the designs of autonomous automobile hardware and software, as well as their components, advantages, and potential future advances.

A new chapter in transportation history has begun with the introduction of autonomous cars, which are using cutting edge technologies to completely change the way people move about. The integration of artificial intelligence (AI) and learning algorithms is fundamental to this progress, enabling cars to reach previously unheard-of levels of autonomy. This study offers a thorough examination of the development of artificial intelligence in autonomous cars, charting its path from basic ideas to the most current developments. The article begins with an overview of the present state of affairs before diving into the basic role that AI plays in influencing autonomous cars' decision-making skills. It clarifies the processes in the AI-powered vehicle development life cycle and addresses prejudice and ethical issues in AI-driven software development for autonomous cars. The paper illustrates how the research environment in the automobile sector has changed over time by providing statistical insights into the types and applications of AI/learning algorithms. The study also emphasizes how parameters play a critical part in truck and automobile algorithm optimization, enabling vehicles to adjust, learn, and perform better over time. In summary, it describes various degrees of autonomy, clarifies the subtle use of artificial intelligence and learning algorithms, and automates important activities at every stage. The paper also addresses the differences in software package sizes among various degrees of autonomy.

In the process of creating technology that is more sensitive and compassionate, human-AI interaction has gained significant attention. Because artificial empathy techniques have the potential to improve both the emotive and social aspects of consumer encounters, they are particularly interesting in this context. This study is to investigate how artificial empathy techniques might be applied to optimize human-AI interactions, hence enhancing emotional and social consumer experiences. The qualitative research methodology involves a study of relevant literature and a number of investigations. Books, journals, and articles that are pertinent to the study topic are the data sources that are employed. The application of artificial empathy techniques in human-AI interactions has a significant potential to enhance the caliber of interactions and consumer experiences, according to the research findings. Artificial intelligence (AI) can react to human requirements and emotions more accurately and sensitively by utilizing technologies like sentiment analysis, emotion identification, and natural language processing.

Empathy computing is a new area of study that combines big data and artificial intelligence (AI) to anticipate, detect, mimic, and create empathy in people. This discipline uses cutting-edge computing techniques to analyze and simulate empathy, building on psychology research in terms of ideas, measurements, brain underpinnings, and applications of empathy. In order to facilitate foundational research and useful applications in this field, this article critically reviews current research on empathy computing and discusses its future directions from a psychological perspective. Based on different purposes and methods, the current research on empathy computing can be categorized into four themes. On the one hand, the main goal of empathy computing is to use computers to evaluate and understand empathy. This attempt may be further subdivided into two categories: (1) empathetic content categorization, which focuses on evaluating empathetic qualities in texts rather than humans, and (2) individual empathy evaluation, which analyzes individual empathetic attributes. However, research is also focused on using computers to simulate and express empathy. Examples of this include the creation of generative empathetic conversation systems and empathetic response systems (3) and (4). The latter uses AI to automatically construct a large range of sympathetic dialogues without relying on predetermined rules, while the former gives users a limited number of predefined rule-based replies and feedback to exhibit empathy. Despite being mostly separate, these four study areas are complimentary. Furthermore, as research advances, new avenues for investigation will keep coming up, like enhancing computers' capacity for empathy via brain-computer interface technology. Although empathy computing research is still in its infancy, it has already demonstrated promise for ground-breaking applications in areas like public management, education, mental health, and business services. These sectors, which entail a great deal of interpersonal connection, are poised to become the key areas of human-computer interaction as artificial intelligence becomes more and more common. Consequently, these become the main use cases for empathy computing. Empathy computing can help automatically assess and improve therapists' empathy levels in the field of mental health. Through AI-driven chatbots, it may also offer individualized, sympathetic assistance and direction. Empathy computing in education can help students learn more effectively by using AI tutors that are sympathetic. In the business domain, it facilitates the provision of customized client experiences by enterprises, which in turn raises consumer happiness and cultivates loyalty by generating sympathetic conversations. Empathy computing can be applied in public management to provide sympathetic conversation in response to disparaging remarks. Furthermore, it makes it easier for decision-makers to react to the demands and questions of the public with empathy, which promotes public-government confidence. These four examples show how empathy computing may be used in a wide range of situations. But it is now impractical to rely only on computers to carry out compassionate duties because of safety and ethical issues. Rather, human-computer cooperation is required. Empathy computing is a revolutionary field that not only offers automated techniques for measuring and analyzing empathy on a broader scale but also enhances the theoretical framework of empathy research. By examining its new expressions in human-AI connections, it expands on earlier research on empathy in interpersonal relationships. The subject of empathy's universality and possible progression in human-computer connection is brought up by this extension. A comprehensive theory of empathy that covers a wide range of relationship dynamics, from human-human to human-machine interactions and beyond, might potentially be built around empathy computing. Future research should concentrate on creating integrated theoretical models of empathy computing, establishing trustworthy psychological and behavioral datasets of empathy-related characteristics, and validating and improving empathy computing research using a human-centered approach. This will help us fully understand empathy and effectively promote it in the context of an intelligent society. In this sector, psychologists are essential for guiding, assessing, and improving practice and research. It is crucial for researchers in computer science and psychology to work together to make sure AI develops empathy in a morally and practically sound manner, which will promote people's well-being in the future intelligent society.

The goal of this study was to find out how empathic human chatbot conversations were among Swedish computer science students at Uppsala University. The study investigated users' perceptions of anthropomorphic chatbots as either humans or machines, whether verbal abuse occurs during human-bot interactions, and how much participants expect chatbot assistance based on gender dynamics. Five students participated in semi-structured interviews as part of the qualitative data gathering process. Thematic analysis was used to manually examine the gathered data. The study's findings indicate that human-chatbot interactions can elicit empathy from participants, irrespective of their perception of anthropomorphic chatbots as either machines or people. However, participants become frustrated when they don't obtain the desired response from chatbots and leave the platform without voicing their displeasure. Usually, they forget about their irritation and return later with new queries, thus the amount of empathy is normally minimal. The study also demonstrates that if chatbots are more likely to be female, users may anticipate receiving more assistance and civility.

Conversational Agents (CAs) have been purposefully created to evoke or portray empathy, from ELIZA to Alexa. While empathy might improve how technology meets human needs, it can also be misleading and even predatory. In this study, we describe empathy in human-CA interactions, emphasizing how crucial it is to discern between human-to-human and human-to-CA evocations of empathy. Towards this goal, we ask CAs supported by large language models (LLMs) to consistently demonstrate empathy when interacting with or discussing 65 different human identities. We also conduct a comparative analysis of the ways in which various LLMs exhibit or represent empathy. We discover that CAs value-judgment certain identities and can promote identities associated with undesirable ideas (such as xenophobia and Nazism). Furthermore, despite their capacity for demonstrating empathy, CAs do worse than human counterparts when it comes to analyzing and delving into a user's experience, according to a computational perspective on empathy.

The usage of chatbots and other interactive software agents in the field of health and well-being is growing. There is a greater requirement to comprehend agents' empathy in these applications, as users and agents converse interpersonally for interventions like comfort, coaching, or behavior modification. There are no tools available in the state-of-the-art right now to perform that. We require a specific definition of empathy in order to comprehend interactive software agents' empathetic capacities. There is no agreed-upon formal definition of empathy in the literature, despite the fact that several definitions are discussed. A formal definition, or ontology, of empathy is created based on a thorough assessment of the literature and a qualitative investigation of contemporary approaches to empathy in interactive agents for health and well-being. We demonstrate the formal definition's potential in a controlled user research by using it to gauge empathy in two cutting-edge chatbots for health and wellbeing, Replika and Wysa. Our results imply that our definition encapsulates the prerequisites for evaluating empathy in interactive agents as well as how it might identify and elucidate patterns in how empathy is perceived over time. The concept, implemented in Web Ontology Language (OWL), might be used as an automated tool to help computers identify empathy in interactions, whether the systems are intelligent systems evaluating the empathy of their interlocutors or interactive agents analyzing their own empathetic behavior.

Theory of mind (ToM) in artificial intelligence (AI) has been proposed by some researchers as a result of improvements in the performance of large language models (LLMs). LLMs are more accurate when they are able to impute intents, beliefs, wants, and emotions. Instead of using the distinctly human technique of empathy, they are trained to assign mental states by identifying language patterns in a dataset that does not normally contain that particular person. We inquire as to whether the lack of empathy in LLMs prevents them from respecting a person's right to be an exception, that is, from character evaluations and behavior forecasts that appropriately take into account an individual's uniqueness. Do LLMs have the ability to evaluate a case only on the basis of its similarities to other cases, or can they give due consideration to an individual's assertion that their situation is unique due to interior mental states such as beliefs, wishes, and intentions? We suggest that, in contrast to the importance of predicting accuracy, which is where LLMs shine, the approach of empathy has particular relevance for respecting the right to be an exception. In conclusion, we explore the question of whether applying empathy to analyze unusual instances has more intrinsic or just pragmatic value, and we provide theoretical and empirical directions for furthering this research.

With the world becoming more and more dependent on AI systems, contentious applications of AI that have a big impact on people's lives are becoming more plausible. As a result, raising awareness of AI prejudice that may harm disadvantaged populations is harder. We conducted a laboratory study in which participants were presented with a biased Wizard of Oz AI while embodying personas that varied widely in their ability to achieve high financial credit scores due to their age and gender. This was done because it has been demonstrated previously that virtual reality increases empathy through immersive perspective-taking. In contrast to a baseline condition in which they believed themselves to be these characters, we discovered that participants assuming personas in virtual reality felt substantially greater empathy toward the characters they embodied and assessed the AI as significantly less fair. In addition, we explore distinctions across embodied personas and deliberate on qualitative findings to acquire understanding of the participants' mental model construction.

This study explores the complex interrelationships between Artificial Intelligence (AI), Investment Decisions (ID), and Emotional Intelligence (EI) in the context of the changing financial decision-making environment. Our research aims to disentangle the intricate relationship between human and machine intelligence by examining the direct impact of human emotional intelligence on investment decisions and clarifying the mediation function of AI in this process. Empirical investigation reveals that EI influences ID directly as well as indirectly through routes mediated by AI. The results highlight the critical role that emotional awareness plays in investor decision-making, which is further enhanced by AI's technological prowess. It implies that while making financial decisions, the majority of investors are impacted by the recognized emotional intelligence. Additionally, AI has a significant influence on investors' decision-making process; yet, AI mediates the link between emotional intelligence and investment choices to some extent. This comprehensive knowledge highlights the necessity for holistic solutions that incorporate emotional and technical components in order to navigate the complexities of contemporary investing environments. It offers insightful information to financial practitioners, legislators, and academics. This study adds to the continuing conversation on the mutually beneficial relationship between human brains and computers in the investing process, as the combination of artificial intelligence and human intuition becomes more and more important in financial decision-making.

One particular moral quality of human behavior is empathy. A distinct set of behavioral and ethical factors, including human empathy, are brought into play by the global workplace and, therefore, when considering employee stakeholders. Furthermore, in corporate organizations, management oversight and human resources are responsible for the human side of the workplace. Therefore, everyday job-related expectations, interactions and practices between employees and employers, and the results of employees' work routines complicate human emotions and interactions. Risk management procedures, human resources, and business ethics are all commonplace in the workplace. The knowledge of models of AI-dependent business practices is beginning to highlight how important it is to take into account the ethical implications of AI's effects on workers in the workplace. Beyond a compliance perspective, this study examines the benefits and hazards of AI ideation, development, and deployment in business-employee interactions practices via a systematic ethical lens and presents additional workplace concerns. Empathy is interested in the motivations of others. Because of this, attributional ethical recommendations about the use of AI in the workplace and its effects on workers are required. Furthermore, this study applies a cognitive empathy perspective to examine artificial morality in relation to ethical issues, ramifications, and workplace practices surrounding the development, use, and practices of AI that may have an influence on workers in a range of business domains.

Empathy-based healthcare chatbot implementation is seen to be a viable way to instill a feeling of human warmth. But current research often fails to recognize the complexity of empathy, which leaves us with a lack of knowledge if artificial empathy is seen in the same light as interpersonal empathy. This essay makes the case that using experiential forms of empathy might feel inauthentic and have unforeseen harmful effects. Alternatively, as instrumental support is more consistent with computer-like schemas toward chatbots, it could be a better fit for modeling artificial empathy. The effects of sympathetic (feeling with), empathetic (feeling with), and behavioral-empathetic (empathetic helping) vs. non-empathetic responses on perceived warmth, perceived authenticity, and their implications on trust and using intentions are investigated in two experimental studies that use healthcare chatbots. The findings show that any level of empathy, as opposed to none at all, increases perceived warmth, which raises trust and utilizing intentions. Empathic and sympathetic replies, as predicted, lessen the chatbot's perceived authenticity, which in turn suppresses this beneficial impact in both trials. This human-to-human backfiring effect is not replicated in a third investigation. Thus, this study emphasizes that empathy is not universally applicable to interactions between humans and robots. It goes on to explain the idea of "perceived authenticity" and illustrates how having characteristics that are distinctly human might backfire if people feel like they are interacting with chatbots inauthentically.

The accuracy and effectiveness of deep learning algorithms are becoming more and more important to a growing range of businesses as artificial intelligence develops quickly. However, because deep neural networks are opaque and have a black box effect, we are only able to receive outcomes without understanding the underlying applied logic. This causes some deep learning-based technology supporters to be skeptical and resistant. It can be challenging for decision-makers to accept the results of emotion analysis in the context of business and public opinion monitoring when the computers are meant to be dispassionate. There are explanation techniques based on mathematics, and they frequently generalize emotion analysis to the goal of categorization. Emotion, however, need to be treated differently from other work categories due to the human-specific elements and reasoning involved in its creation. Based on psychological theories, this research suggests an explanatory framework for emotion analysis that emphasizes the stimulus from traditional emotion theories. The two primary components of this suggested framework, which emphasizes on the source and trigger of emotions as an explanation for deep learning-based emotion analysis, are the extraction of the emotion cause and the visualisation of words that elicit emotions.

The tourist business has been overtaken by artificial intelligence chatbots because of their great efficiency and low cost. Researchers haven't paid much attention to how chatbots' emotional expressions affect customer outcomes, though. Using three trials and the expectation violations theory, we investigated how chatbot emotional expressions impact consumer pleasure when it comes to recommending tourism attractions. By lowering expectation breaches, chatbots' compassionate displays of concern for users might raise customer satisfaction levels. The negative association between emotional expressiveness and expectancy violation can be moderated, in particular, by the customer's goal orientation, the human-likeness of chatbot avatars, and the sort of interaction that exists between consumers and chatbots. These results contribute to the understanding of chatbot emotional expressions and offer important information for using chatbots in tourist customer care.

A thorough analysis of the connection between artificial intelligence and emotions in Latin American and Caribbean schooling is presented in this chapter. Taking into consideration theories, techniques, nations, and educational levels, the PRISMA systematic review approach was employed to characterize the current status of the research situation on this subject. Finally, fifteen published publications with a focus on Brazil and Colombia, at the university level, using students as the unit of study, and utilizing a combination of software, psychology, and facial recognition techniques were chosen. It is intended to further research using different ideas and approaches in various fields.

This article presents a study that uses computer vision algorithms and artificial intelligence (AI) to identify human emotions in video recordings as users interact with various visual stimuli. The goal of the project is to demonstrate how artificial intelligence (AI) algorithms and image processing pipelines may be used to detect emotions in software. The procedure entails evaluating individuals via photos and enabling computer vision algorithms that are in line with psychological theories that describe emotions and their distinguishable characteristics. The study shows that software creation and training based on facial expressions, together with the use of convolutional neural networks (CNNs) for emotion identification, are feasible. The outcomes show that emotion recognition is successful; however, more training for settings with a wider range of picture types and additional algorithms to discern closely related emotional patterns are required for accuracy improvement. The promise of AI is emphasized in the debate and conclusions. Using computer vision algorithms in the identification of emotions, offering perceptions into the creation of software, continuous training, and the changing field of emotion recognition technology. In order to improve confidence and accuracy, new algorithms that can discriminate between facial expressions that portray closely comparable emotional patterns will need to be developed and trained for situations with a wider variety of pictures.

A sizable number of clinical cases conducted since the 1950s have attested to the value of art in psychiatric and rehabilitative therapy. The development of artificial intelligence technology has led to the development of AI painting software that uses feedback and prompts to create images based on the Stable Diffusion algorithm paradigm. Thus, a crucial consideration for AI painting software's use in art therapy is whether or not it can enhance human emotions. Using techniques for measuring emotional lexicon, this study monitors and assesses the emotional changes that patients experience both before and after using the AI painting program Stable Diffusion WebUI. The project's experimental data suggests that artificial intelligence painting can have a favorable emotional impact on people. This finding creates new opportunities for combining artificial intelligence with art therapy research. On the one hand, it makes it possible to construct guided AI painting software in-depth, which is especially useful for art therapy—a type of AI software that uses art to cure. Conversely, it promotes more investigation into the workings of AI-assisted painting vs conventional painting in art therapy, with the goal of learning more about the fundamental ideas and workings of art therapy.

Introduction: Artificial intelligence and neuroscience have been combining forces in recent years, especially in the area of brain research and the creation of therapies for neurological conditions. Deep learning and artificial neural networks offer important new perspectives on how the brain processes information. Current studies attempt to elucidate how brain functions affect an individual's level of pleasure. OBJECTIVES: To assess, in light of AI advancements, the relationship between happiness and neurobiology. METHODS: Articles from the Scopus database from 2013 to 2023 were utilized for a bibliometric study, and information was processed using VOSviewer. RESULTS A total of 603 papers were acquired, and it is clear that the United States (184), the United Kingdom (74), and China (73), are the centers of the most significant scientific creation. The Co-occurrence - Author Keywords analysis yields three groups. The applications of artificial intelligence (AI) to forecast pleasure are associated with the first cluster, red; AI tools in neuroscience are associated with the second cluster, green; and AI tools in psychology are connected with the third cluster, blue. Conclusion: Our knowledge of mental processes like emotions and awareness has advanced significantly as a result of neuroscience study. Happiness has been studied in neuroscience, and the field is becoming more open to an approach that looks for data to help artificial intelligence's understanding of people's well-being.

Artificial intelligence (AI) and artificial general intelligence (AGI) have advanced significantly as a result of the search for biologically inspired cognitive architectures, or BICA. But emotions and sentiments are a crucial component of human intelligence that are absent from the majority of BICA models already in use. In this study, an emotion-integrated cognitive architecture that simulates human emotional processing inside a computer framework is developed and put into practice. The Emotion-Integrated Cognitive Architecture (EICA), which we have presented, draws inspiration from the most recent research in affective computing, neurobiology, affective psychology, and neuroscience. In order to create robust, versatile, and adaptive AI agents that can react to complex and dynamic situations with human-like emotional intelligence, EICA seeks to incorporate emotional processing into the heart of the AI system. The EICA model makes use of developments in brain imaging and recording methods to extract information on the neurological underpinnings of human emotions. AI agents are able to detect, understand, and react to emotions in both themselves and other people thanks to the architecture's incorporation of emotion-generating, detection, and control processes. We introduce the notion of EICA, encompassing its modular framework and its interplay with additional cognitive elements. Additionally, we offer case examples that demonstrate how EICA has been successfully used to a range of AI applications, including adaptive robots and virtual assistants. This work advances the computer reproduction of human emotional intelligence, which is a major step towards realizing the BICA Challenge. We are getting closer to reaching the full potential of bi-directional understanding between artificial and biological intelligences by incorporating emotions and feelings into AI systems.

One key source of social knowledge for netizens is network news. A deluge of news content makes it difficult for netizens to find important information. Under artificial lighting, named entity recognition technology can classify location, date, and other information from text data. Deep learning technology and named entity recognition are combined in this article. The suggested technique, in particular, presents a Named Entity Recognition (NER) model that may attain high accuracy with a limited amount of training data sets and an automated annotation strategy for Chinese entity triggers. Using a trigger-matching network, the technique simultaneously trains sentence and trigger vectors, using the trigger vectors as attention queries for later sequence annotation models. Moreover, the suggested technique makes use of entity labels to identify neologisms in online news in an efficient manner. This allows for the modification of the set of sensitive words and the quantity of words in the set that need to be identified, in addition to expanding the lexicon of web news terms that convey sentiment for sentiment observation. According to experimental results, the suggested model performs better than the standard BiLSTM-CRF model, using just 20% of the proportional training data set, as opposed to the conventional model's 40% of the training data set. Furthermore, the loss function curve demonstrates that my model outperforms the comparative model in terms of accuracy and convergence speed. In conclusion, my model's average accuracy rate for sentiment perspective recognition is 97.88%.

In order to categorize English text emotion expression and information communication in accordance with the human emotion-value relationship, this paper first investigates these topics. It then lists the hallmarks of English emotion expression and information communication. Second, it is suggested to build an analysis model for English text emotion and information transmission using the BiLSTM neural network, utilizing artificial intelligence technology. The BiLSTM neural network is used to extract the emotional features of English text and solve the problem of the loss of emotional features through the loss function in order to deal with the characteristics of English text quickly and effectively. This process of encoding the emotional information of English text is necessary in order to deal with its characteristics. The dataset from the Chinese English module of the MOOC of Chinese universities is then obtained using the crawler tool, and the evaluation indexes are set based on the model's performance. This is followed by an experimental analysis of the English text's ability to convey information and express emotion. The findings demonstrate that the BiLSTM-based neural network outperforms the original CNN, LSTM, and T-LSTM in the task of text emotion expression and information conveyance, with the accuracy rate remaining above 0.925. Additionally, the effect on the English dataset is marginally better than that on the Chinese dataset. The purpose of this study is to improve communication between Chinese and other cultures as well as English instruction.

The goal of Multimodal Emotion Recognition in Conversations (ERC) is to recognize the emotions that are expressed by every word in a video discussion. When addressing intra-modal interactions, current approaches struggle to strike a balance between intra- and inter-speaker context dependencies. This delicate balance includes modeling both the self-dependency (emotional inertia) of speakers and the interpersonal dependence (empathy) of speakers' counterparts' emotions on them. In addition, handling cross-modal interactions—which comprise content with contradictory emotions across many modalities—presents difficulties. In order to improve intra- and cross-modal interactions, we provide AdaIGN, an adaptive interactive graph network (IGN) that uses the Gumbel Softmax technique to adaptively pick nodes and edges. We employ a directed IGN, as opposed to undirected graphs, to stop utterances in the future from affecting the present one. Next, we design a task-specific loss function that prioritizes text modality and intra-speaker context selection; we also propose Node- and Edge-level Selection Policies (NESP) to guide node and edge selection, and a Graph-Level Selection Policy (GSP) to integrate the utterance representation from original IGN and NESP-enhanced IGN. We employ pre-defined pseudo labels using self-supervised approaches to mask unneeded utterance nodes for selection in order to minimize computational complexity. On two widely used datasets, experimental findings demonstrate that AdaIGN performs better than state-of-the-art techniques. Our AdaIGN code can be seen at https://github.com/TuGengs/.

In medical imaging, tumor segmentation in breast ultrasound (US) pictures is a crucial problem. Even for experienced radiologists, segmenting and classifying anomalies can be challenging due to the low quality of US pictures and the different specifications of US equipment. The goal of the research is to present a unique AI-based hybrid model for US segmentation that can handle data that has never been seen before, gives excellent accuracy, and uses comparatively less datasets. The US-guided biopsies and diagnostics may both be performed using the program. We have presented a novel and resilient hybrid strategy that blends multi-agent artificial life (AL) and deep learning (DL). Three US datasets are used to validate the methods. The approach works better than 14 carefully chosen cutting-edge algorithms when applied to US photos with complicated geometry and a lot of noise. The article provides an innovative categorization of the pictures and assessments to examine the boundaries of the DL. Using 1264 ultrasound scans, the model has been trained and validated. Both JPEG and PNG formats are used for the photos. The patients are between the ages of 22 and 73. DL techniques, machine learning, edge linking, superpixels, and deformable forms are among the 14 benchmark algorithms. Eight-region shape- and contour-based assessment measures are used in the testing. In terms of the dice coefficient (region) and the relative Hausdorff distance H3 (contour-based), the suggested method (DL-AL) yields excellent results as follows: Dice = 0.96 and H3 = 0.26 for the easiest image complexity level; Dice = 0.91 and H3 = 0.82 for the medium complexity level; and Dice = 0.90 and H3 = 0.84 for the hardest complexity level. The pattern is the same for all other measures. The DL-AL performs 10–20% better than the second-best (Unet-based) approach. A number of non-traditional tests have also been performed on the approach. The model was applied to the complete set of photos after being trained on images with low complexity. This is a summary of the findings. (1) Dice = 0.80 and H3 = 2.01 are the only low complexity pictures that were utilized for training (68% unknown images). (2) Of the photos used for training (51% unknown images), the low and medium complexity images are Dice = 0.86 and H3 = 1.32. (3) Dice = 0.92 and H3 = 0.76 are the low, medium, and hard complexity pictures that were utilized for training (35% unknown images). These experiments demonstrate that DL-AL has a noteworthy 30% advantage.

Artificial intelligence (AI) has become a game-changer in a number of industries, including healthcare and medicine. With prompts, large language models such as ChatGPT produce writing that appears human. This highlights the promise of AI. The flexibility of ChatGPT has the potential to transform healthcare procedures, enhance patient care, and improve communication between medical staff, patients, and data. ChatGPT quickly distributes important information related to pandemic management. It facilitates dental procedures, streamlines medical education, acts as a virtual assistant for surgical consultations, and helps diagnose illnesses. Eight major categories were used to group the 82 papers: G1 covers treatment and medicine; G2 covers buildings and equipment; G3 covers disease-related parts of the human body; G4 covers patients; G5 includes citizens; G6 covers cellular imaging, radiology, pulse, and medical images; G7 includes doctors and nurses; and G8 includes tools, devices, and administration. It's still difficult to strike a balance between AI and human judgment. The PRISMA method was used to conduct a systematic literature review that examined the transformational potential of AI in healthcare, emphasizing ChatGPT's many uses, constraints, drive, and difficulties. In conclusion, ChatGPT's wide range of medical applications show off its inventiveness and make it an invaluable tool for scholars, students, and healthcare researchers. This study also acts as a guide, helping scholars, researchers, and students in the medical and healthcare fields.

Models of human language processing that are computationally feasible include artificial neural networks. The fact that computer programs are given significantly more training data than people do while learning a language is one of their main criticisms. Here, we explore how the amount of training data affects the models' capacity to capture human fMRI responses to words using two complimentary techniques. We first test GPT-2 models against an fMRI benchmark that were trained on one million, ten million, hundred million, or one billion words. Given that the quantity of training data in the 100 million word model is comparable to what infants are projected to be exposed to throughout their first ten years of life, we see this model as developmentally reasonable. Second, we evaluate the ability of a GPT-2 model trained on a dataset of nine billion tokens to achieve, at various points during training, state-of-the-art next-word prediction performance on the human benchmark. Using both methods, we discover that (i) the models trained on a reasonable quantity of data for development have already reached almost maximum performance in fMRI responses to phrases. Moreover, (ii) stronger alignment with human data is linked to lower perplexity, a measure of next-word prediction performance. This implies that models that have been sufficiently trained to attain high next-word prediction performance also learn sentence representations that are predictive of human fMRI responses. Together, these results show that while some training is required for the models to be predictive, a developmentally appropriate training set (~100 million words) could be adequate.

This research looks at the ethical issues and legal framework around artificial intelligence (AI) in terms of data integrity and how it affects social dynamics. Primary data was gathered from 650 AI practitioners in a variety of industries, including developers, data scientists, ethicists, and policymakers, using a cross-sectional survey technique. The efficacy of AI deployment and data integrity were examined, along with the relationships between regulatory compliance, ethical awareness, professional training, and expertise in AI practice. The results showed a significant positive association between perceived efficacy in using AI and greater levels of regulatory compliance as well as between data integrity assurance and awareness of AI ethics. Furthermore, a strong correlation was found between professional AI training and the improvement of social dynamics. Despite having a favorable correlation, expertise in the field of artificial intelligence had a lesser association with data integrity, suggesting that experience alone is not enough to guarantee good AI practices. The research emphasizes the significance of professional training, legal frameworks, and ethical issues in influencing AI development and its social ramifications. It is highlighted that dynamic, flexible, and inclusive regulatory frameworks are necessary in order to bring AI techniques into compliance with ethical standards and social values. Future avenues for investigation include the influence of developing technologies like quantum computing on AI ethics as well as the ethics and governance of AI in various cultural contexts.

Artificial intelligence (AI) systems and robots are becoming more and more like human communicators as a result of advancements in AI. They pose the following queries:1. if it's feasible to interact with, comprehend, and even perceive artificial entities with empathy;2. if, after a given amount of simulation, we should grant them true subjectivity and, hence, quasi-personal status;3. what will happen if the line between simulated and real encounters becomes increasingly blurred? (1) To address these issues, the paper makes the case that shared emotions and a we-intentionality are made possible by the implicit assumption of our counterpart's subjectivity, which is a prerequisite for truly understanding others. This assumption ultimately rests on the presupposition of a shared form of life, here understood as conviviality. (2) Embodied and enactive cognition, which connects subjectivity and consciousness to the aliveness of an organism, disproves the theory that future artificial agents could meet these preconditions. (3) Even if subjectivity is theoretically impossible for artificial agents, the line between simulated and real subjectivity may nevertheless become increasingly blurred. Here, potential repercussions are spoken about, particularly with reference to online psychotherapy. Lastly, the study argues against a systematic illusion of subjectivity and advocates for a thoughtful approach to the terminology we use when discussing artificial systems.

This essay discusses the current developments in artificial intelligence and the growing interest in it in the media. Eliezer Yudkowsky, a prominent player in the field of artificial intelligence alignment, is given significant attention in an effort to close the knowledge gap between the general public's and rationalist perspectives on AI technology. In this emphasis, his proposed artificial intelligence plan of action—described in his unpublished document AGI Ruin: A List of Lethalities—is analyzed. This is accomplished by making an effort to comprehend the idea of intelligence itself and coming up with a practical definition that makes sense. The idea of intelligence is then used to analyze the capabilities and advancements of modern artificial intelligence in order to determine how applicable it is to these technologies. According to this research, there is some intelligence present in modern artificial intelligence systems. Nevertheless, it challenges the ideas of artificial intelligence alignment and calls into question the veracity of Nick Bostrom's Orthogonality Thesis by arguing that both powerful and weak artificial intelligence systems, devoid of human-defined goals, would not inherently pose existential threats to humanity. Additionally, the prospect of creating artificial life by combining several modules that each simulate a certain mental function is explored.

The remarkable powers of living things stem from the way their bodies manifest autonomy. Living things combine physical and computational intelligence through mechanical compliance, multifunctionality of materials, and bodily form across many sizes. Although the design and construction of physically intelligent bodies have evolved thanks to soft robotics, integrating information-processing skills for computational intelligence is still difficult. As a result, current soft robot design is limited by constraints related to perception and control. Deliberate convergence in the codevelopment of novel materials, manufacturing techniques, and control systems for soft robots will be necessary to advance toward untethered autonomy. Here, a novel viewpoint is presented: problems by themselves should be used by academics to impose material and information restrictions on the design of soft robots. To avoid the constraints imposed by control techniques, a task-first design paradigm is suggested along with a conceptual framework. With this approach, task-capable agents may easily take advantage of emergent synergies between material and information processing capabilities of soft matter. The scale dependency of solutions receives special attention. Lastly, a research view on new avenues for developing autonomy for future soft robots, from paramecia to elephant trunks in size, is given.

This work introduces computer animation to the Self-Reproduction feature of Artificial Life. A gene-control based self-reproduction model of artificial fish is proposed and constructed. The contents of Artificial Fish's chromosome are provided based on its phenotypic. Heredity guidelines are provided on the basis of this model. In the virtual marine environment, artificial fish might procreate and develop under the free reign of the gene model and regulations. Predetermined and nondeterminate behaviors are examples of artificial behaviors. Artificial intelligence-based cognitive models are proposed and developed to regulate high-level behaviors of artificial fish. A simulation software is created and developed using all of the previously constructed models. These laid the foundation for raising the automation level and efficiency of artificial fish animation.

This article addresses the question "Is Artificial Life true Life?" as well as the notions of "Life," "Artificial Life," and "Generalized Artificial Life."

This study describes an artificial life competitive game that mimics an artificial life setting and is used to educate artificial intelligence (AI) in an unstructured, casual manner to students pursuing professions in computer science and engineering. on the game, two colonies of software agents, or microbes, must fight to live on a replicated Petri dish. In order to win over the whole artificial environment, the players must adopt fundamental reproduction laws and combat techniques for their agents in order to accomplish this aim. A thorough explanation of the artificial life model and the technological foundations of the competition are provided. We talk about the pedagogical experience gained during the contest creation and the subsequent learning experience that sparked students' interest and assisted them in creating mental models of potential AI algorithms.

When it comes to power flow optimization, fuzzy logic proves to be an effective technique, especially when dealing with deregulated power networks. Fuzzy logic controllers may be used to arrange distribution generators (DGs) in the best possible way, as long as optimal power flow solutions and fuzzy logic controllers are used to identify the dependability indices and preserve system feasibility. Distribution generator units should be positioned strategically in a deregulated power system to reduce power loss and improve overall system performance by reducing volatility. In a deregulated electricity system, access to optimal power flow algorithms becomes crucial to pinpoint weak points, particularly within transmission firms. The distribution and transmission networks should both be suitably modified to reduce congestion inside the corresponding businesses. Using information gathered from distribution and transmission businesses in the deregulated electricity system, the aggregator must evaluate the system's performance.

The reasons of technological disruptions in electrical systems are examined in this article, along with a number of distinctive drawbacks related to the automation and protection of electrical system components. It is proven that switching from analog to digital forms of protection has a tendency to make relay protection less reliable. The usage of fuzzy logic in safeguards, the practicality of including fuzzy logic components in protection devices, and the automation of electrical systems to recognize different kinds of short circuits are all supported by the examined cases. This article describes the findings of modeling an electrical system with transformer coupling, where all kinds of asymmetric short circuits were created, and examines the most typical damages. The forward, backward, and zero sequences' symmetrical short-circuit current changes and their corresponding dynamics are ascertained. There are established guidelines for recognizing asymmetric short circuit types. Using fuzzy logic components, an automation and protection method has been created. The time it takes to identify the kind of damage and activate safeguards will be shortened by the suggested protection and automation methodology.

A method of evaluating a mobile application's usability that makes use of fuzzy logic principles is called fuzzy logic-based quantification of usability expectation for an m-commerce mobile application. Any mobile application's usability may be used to analyze the expectations and preferences of the user to determine how the application meets their needs. There is never a better option for quantification than fuzzy logic. The user experience of an m-commerce mobile application is evaluated using fuzzy logic-based quantification of usability expectation, which takes into consideration the requirements, preferences, and expectations of the user. The degree to which the program satisfies the user's expectations, the user's ability to comprehend and engage with it, and their overall level of happiness with it are all included in the usability expectation. The developers may make the required adjustments for a better user experience by using this technique to help identify areas that need improvement. This study uses fuzzy logic to quantify the overall usability quality of a mobile m-commerce application after presenting the creation of a usability metric framework. The goal of the suggested usability metric framework, which is based on the Goal-Question-Metric (GQM) methodology, is to offer a thorough and organized method for creating metrics that evaluate the qualitative aspects of mobile apps. The framework offers a set of quantifiable criteria to measure m-commerce mobile applications in accordance with standards. It was designed and tested in an m-commerce scenario. The evaluation's findings may then be applied to enhance mobile m-commerce apps and guarantee that the user experience is optimal.

The controller maintains maximum potential energy conversation to operate the pimping system at nominal conditions. Fuzzy logic intelligent controllers are successfully suitable and applicable in engineering and applied science. Climate changes have a direct impact on the performance of photovoltaic (PV). In order to maximize energy production in a variety of weather conditions, this paper aims to present an experimental approach for the implementation of fuzzy logic maximum power point tracking (MPPT) with boost converter based on an Arduino Mega micro-controller. This approach will be applied to a small-scale pumping system for water and chemical fluid analyses in an isolated area. Twenty (W) solar photovoltaic (PV) panels power the system. The MATLAB/Simulink fuzzy logic method for real-time control and monitoring of MPPT applications is presented in this paper. It makes use of an inexpensive Arduino Mega micro-controller along with (LV25, LP55) sensors to control a boost converter that is connected to a plastic pump and solar panel.

This paper investigates voltage stability in a PV-based DC microgrid using a fuzzy logic controller (FLC). The microgrid is composed of loads, a DC-DC converter, and many photovoltaic (PV) modules. Because PV electricity is often used intermittently, voltage stability is a critical and challenging issue for DC microgrids. This paper suggests an FLC-based voltage control method that determines the optimal course of action for maintaining the voltage stability of the system by utilizing input elements such as PV output power, DC-DC converter duty cycle, and load current. Simulation is used to evaluate the FLC's performance, and it is designed to be robust to errors and changes in the parameters. The simulation results show that across a range of operating conditions, such as fluctuating solar irradiance and load changes, the proposed FLC-based control method successfully maintains the microgrid's voltage stability. Additionally, the FLC outperforms alternative control strategies.

The complexity of adaptive fuzzy event-triggered formation tracking control for nonholonomic multirobot systems with unlimited actuator defects and range limits is explored in this research. In order to tackle these problems, we utilize the capabilities of fuzzy logic systems (FLSs) and apply adaptive techniques to estimate uncertain parameters and nonlinear functions that are prevalent in robotic dynamics. Due to restrictions on distance and visual fields, collision avoidance and connection maintenance are constant issues throughout information exploration. To successfully address confined range obstructions, we therefore develop a generic barrier function and recommended performance technique. In addition, in order to minimize the quantity of controller executions and offset the impact of infinite actuator failures, robots communicate with their leader during actuator failures by utilizing fewer network communication resources while continuing to track the intended trajectory that the leader has generated. We suggest a decentralized adaptive event-triggering fault-tolerant (ETFT) formation control approach with the use of dynamic surface technology. All of the signals are guaranteed to be semi-global, uniformly ultimately bounded (SGUUB). In the end, we show that the ETFT control method for nonholonomic multirobot systems is practically feasible.

Although fuzzy inference systems (FISs) have been around for a while, applying them to high-dimensional situations is still a difficult undertaking. The product and minimum operators are the most commonly utilized T-norms for calculating firing strengths; the former is typically used due to its differentiability. Nevertheless, the numeric underflow problem affects the product T-norm for high-dimensional applications. In this work, we mainly address the issue related to high-dimensional FIS (HDFIS) design and the use of T-norms. We build an HDFIS, called HDFIS-prod, for the product T-norm that readily overcomes the numerical underflow issue. Our proposal for an adaptive dimension-dependent membership function (DMF) is the primary innovation. We have developed a method for the minimal T-norm based on an empirical discovery. This mechanism naturally handles super high-dimensional issues, and the outcome is another HDFIS called HDFIS-min. Tests are conducted on 18 datasets with feature dimensions ranging from 1024 to 120450 for both HDFIS-prod and HDFIS-min. The outcomes of the simulation show that they can both handle high-dimensional datasets with competitive performance.

This paper looks at a way to improve the dynamic performance of induction machines by addressing the main control issues. Some disadvantages of traditional direct torque control and indirect control with flux orientation include rising time, torque ripples, torque harmonics, and flux ripples. We suggest a comparison of earlier methods with the fuzzy logic technique in this paper. The simulation's results demonstrate that the fuzzy logic direct torque control approach avoids torque and flux variations at low switching frequencies and is more effective at responding quickly and precisely without overshooting. Increased operational reliability and efficiency are benefits of the dynamic performance enhancements that have been shown in industrial applications.

This paper's main idea is to validate a methodological approach to personnel risk assessment for businesses using fuzzy logic apparatus. The purpose of this approach is to identify personnel risk management issues and formulate recommendations for effective solutions. The classic guidelines and foundational works of both domestic and international scientists, statistical data, and the findings of our investigation into the challenges of evaluating human risks of businesses form the methodological basis of the study. Fuzzy set theory, comparative analysis, scientific abstraction, system complex approach, and the generalization of scientific experience of contemporary theoretical research were among the methodologies employed. The study offered a systematic framework for evaluating an organization's people risk level; numerical trials were carried out using a sample of construction equipment manufacturers. The work considers hierarchical fuzzy data, specifically: four groups of indicators for assessing the level of personnel risks (quantitative composition – F1, state of qualifications and intellectual potential – F2, staff turnover – F3, motivational system – F4). Each of the indicators has a different number of fuzzy coefficients (there are twelve of them in the current work – vi, i=1÷12). Analysis of the results of assessing the level of personnel risks of enterprises made it possible to identify the problems with managing personnel risks at enterprises. Functions of fuzzy coefficients make up the indicators: F1 = r(v1, v2, v3); F2 = g(v4, v5, v6, v7); F3 = h(v8, v9, v10,); F4 = q(v11, v12). The personnel risk level has a functional, integrated indicator Int = f(F1, F2, F3, F4) as an output variable. This indicator is also fuzzy. In this case, the functions r, g, h, q, and f of the supplied variables are unknown functions. All of the input data have been evaluated by experts, and their opinions generally fall into one of three categories: Low (I), Medium (G), or High (E). Each variable's formalized information may be expressed as, and given a set of indicators, we have. The following structural components of a fuzzy system are necessary for using and calculating with its assistance: an output mechanism, a rule base, and membership functions of input and output variables. The components that will be constructed while creating a fuzzy system are these structural parts. It is possible to evaluate the degree of people risk at the company thanks to the developed mathematical model and the way of formalizing it on the basis of FST. This allows for the further validation of a set of measures to improve the effectiveness of its usage. Because the developed fuzzy logical inference system makes use of computational intelligence components—specifically, the fuzzy set theory—it may be regarded as intelligent. Unlike existing approaches, the proposed methodological approach to evaluating the personnel risks of enterprises based on fuzzy logic apparatus allows to integrate the consideration of both qualitative and quantitative indicators when evaluating the personnel risks and personnel movement indicators. It also significantly increases the effectiveness of decision-making in uncertain situations and lowers costs when unfavorable circumstances arise.

The presence of different kinds of random perturbations in real-acting objects is a defining characteristic that lowers the quality of the control process and necessitates the application of contemporary intellectual technology methods to solve the problem of synthesizing control systems of structurally complex dynamic objects. This allows for the partial uncertainty and randomness properties to be used as a means of mitigating the influence of external factors. The theory of intelligent control is applied to analyze problems related to the synthesis of the automatic control system of dynamic objects in this article. Here, the neuro-fuzzy approximation of the control system is achieved at each discrete interval by the employment of a neural network based on radial-basis functions, enabling real-time modification of the regulator settings. The purpose of the radial basis function is to approximate functions that are specified implicitly as pattern sets. A genetic algorithm is used to configure the parameters of the neuro-fuzzy regulator, making the computation of the regulator's set parameters more efficient. The vector representation of the regulator's parameters makes it easier to apply them to multidimensional objects. A evolutionary algorithm was employed to find the ideal tuning parameters of the neuro-fuzzy regulator, which is characterized by strong convergence and the ability to identify global extrema. The potential to provide quality control of the dynamic object under random perturbations and ambiguity of input data explains the neuro-fuzzy regulator's efficacy.

Modern technology and easy access to the internet have led to an abundance of alternatives and information overload, which makes decision-making quite challenging. A such method for helping people make judgments is the recommender system (RS), which suggests or forecasts product ratings. The three main types of reinforcement learning (RS) that employ implicit or explicit feedback for recommendation are content-based, collaborative, and hybrid filtering. Although ratings are the most popular type of feedback, other forms like as product descriptions, reviews, photos, audios, and videos can also be useful in enhancing the functionality of the conventional RS. The performance of RS may be significantly impacted by these other factors. Thanks to recent developments in artificial intelligence and deep learning, RSs are currently being built utilizing Convolutional Neural Networks (CNN), which may effectively leverage auxiliary information. Traditional RSs employed methodologies based on the closest neighbor or other machine learning models. This article offers a thorough analysis of CNN-based RSs and how they could employ different kinds of supplementary information, in addition to comparing them on common grounds. The research also covers supplementary information included in a range of publicly accessible datasets, data statistics, and data features. Additionally, many metrics for evaluating RSs are covered, and readers are presented with thought-provoking problems and unresolved research questions.

With the ongoing advancements in science and technology, particularly in the areas of artificial intelligence, machine learning, and other fields, the educational system has started to implement more customized material in addition to more conventional functions in recent years. Conventional educational institutions frequently use a one-size-fits-all method of instruction that ignores the individual demands and learning preferences of every student. In order to improve learning outcomes, a personalized and optimized education system using machine learning algorithms can offer tailored learning materials and recommendations based on each student's learning background, interests, and skills. Additionally, these algorithms can provide real-time feedback on student performance and modify learning plans in response to that feedback. As a result, learning becomes more tailored and dynamic. As a result, it may be used in all subject areas of study, including science, math, and language instruction. Nonetheless, enhancing the effectiveness of machine learning algorithms is mostly dependent on advancing numerical optimization algorithms; hence, a summary of optimization algorithms is imperative in large-scale machine learning. In addition to introducing the algorithm optimization method, this study attempts to provide a thorough review of the machine learning algorithms currently in use for optimizing customized education recommendation systems.

An extensive survey of the literature on the development and use of machine learning (ML) algorithms in recommender systems (RS) is provided in this study. Published in 2023 (January–June), the study attempts to pinpoint current trends, investigate practical applications, and direct scholars in directing their research endeavors in this area. The results are divided into several categories, such as digital journalism, e-commerce, education, healthcare, and machine learning algorithms (auto-encoders and reinforcement learning). In light of the application in manufacturing enterprises, the review highlights the improved recommendation accuracy, increased scalability, personalization and context awareness, various ML techniques, and strategies for handling cold start and data sparsity. It also lays the groundwork for future advancements in ML algorithms for RSs.

The goal of smart cities is to enhance the quality of life for city inhabitants by combining information and communication technology (ICT) with urban management. Within this framework, recommender systems—tools that provide urban residents with tailored recommendations—have become important agents of this convergence. Their capacity to interpret large volumes of data generated in urban environments and their effective use in a variety of sectors of city life have hastened their standing as a significant technology in the evolution of city planning. Among the methods we used was a review of the Web of Science database, which produced 130 papers. These were then whittled down to 86 by applying relevance filters. First, a bibliometric study was conducted with the aim of using the SciMAT tool to analyze structural characteristics. Second, the PRISMA 2020 declaration was used to conduct a systematic evaluation of the literature. The findings demonstrated the many methods used to filter suggestions in fields including travel, health, mobility, and transportation. This study is seen as a major breakthrough that will help smart cities develop and become more efficient. It will also provide a strong foundation for further research in this rapidly expanding sector.

Applications for remote healthcare based on the Internet of Things (IoT) offer patients who are at risk quick access to preventive care. But forecasting cardiac disease is a difficult undertaking, and diagnostic accuracy is seldom achieved. A unique Recommendation System for Cardiovascular Disease Prediction Using IoT Network (DEEP-CARDIO) has been presented to provide dietary advice, treatment suggestions, and pre-diagnosis for cardiac disorders in order to solve this problem. In the beginning, four biosensors—the ECG, pressure, pulse, and glucose sensors—are used to remotely gather the patient's physiological data. The IoT sensors' gathered data is sent to an Arduino controller, which uses it to forecast and identify the illness. BiGRU (Bidirectional-Gated Recurrent Unit) attention model is used to create a cardiovascular disease prediction model that diagnoses cardiovascular illness and categorizes it into five different cardiovascular classes. Through a user-friendly smartphone application, the recommendation system offers nutritional and activity advice to cardiac patients based on the identified data. Using real-time Framingham and Statlog heart disease datasets, Cloud Simulator (CloudSim) validates the DEEP-CARDIO's performance. The total accuracy achieved by the suggested DEEP CARDIO approach is 99.90%, whereas the MABC-SVM, HCBDA, and MLbPM methods are 86.91%, 88.65%, and 93.63%, respectively.

The most recent attempt to provide managers and customers computing resources as a service signifies a move away from computing as a product that is bought and toward computing as a service that is provided to users via the internet from sizable data centers. But as cloud-based IoT and artificial intelligence (AI) proliferate and advance customer experience automations in numerous application domains, including recommender systems (RS), it has become necessary to make a number of adjustments to support the IoT devices at the heart of the automation universe, including cutting-edge language models like ChatGPT and Bard and technological advancements like nanotechnology. This study presents IoT-driven fog computing (FC), a current computing advancement to the marketing community. While several studies on FC "smart" applications have been published, none have been done on fog-based smart marketing areas such recommender systems up to this point. FC is regarded as a cutting-edge computing system that may reduce latency and enhance bandwidth use for applications involving autonomous consumer behavior that need to make data-driven decisions in real time. In order to encourage further research, this paper offers a conceptual framework for examining the impact of fog computing on consumer behavior, using the junction of FC and RS as an example. In fact, the way we conceptualize "fog-based recommender systems" opens up a wide range of interesting and difficult research directions, some of which are discussed later in this paper. Keywords: artificial intelligence (AI), edge computing, fog computing, recommender system, internet of things (IoT), software defined networks (SDNs), information, as well as situational and personal data [66].

Investigating the efficacy of recommender systems in knowledge discovery was the main goal of the study. approach: A desktop research approach was used in this study. Secondary data, or data that may be gathered without fieldwork, is referred to as desk research. Since desk research mostly entails gathering data from already-existing resources—executives' time, phone bills, and directories—it is frequently seen as a less expensive method than field research. As a result, the study used data, reports, and studies that have already been published. It was simple to obtain this secondary data by using the library and internet journals. Conclusions: The conclusions show that there is a methodological and contextual gap concerning recommender systems in knowledge discovery. According to a research on recommender systems' usefulness in knowledge discovery, these systems are essential for helping users explore large amounts of information so they may find pertinent resources and learn more. It was discovered that recommender systems using sophisticated algorithms and customized methods were more successful in producing pertinent recommendations that were catered to the interests and requirements of users. Furthermore, the study emphasized the significance of encouraging active user participation in the recommendation process by highlighting the favorable association between user engagement indicators and knowledge discovery outcomes. It was also discovered that contextual information had a critical role in determining how effective recommendations were. In summary, the study emphasised how important it is to continuously improve and optimise recommender system algorithms in order to improve user outcomes when it comes to information discovery. Special Contribution to Theory, Practice, and Policy: Future research on recommender systems in knowledge discovery may be anchored by the Social Learning, Information Foraging, and Cognitive Load theories. Recommendations for improving the effectiveness of such systems were given by the research. It recommended using hybrid recommender systems, which combine content-based and collaborative filtering methods to provide recommendations that are more varied and accurate. The study also underlined how crucial it is to incorporate contextual data into recommendation algorithms so that suggestions may be constantly modified in response to situational circumstances. In order to increase recommendation processes' transparency and consumer comprehension, it also suggested using explainable AI methodologies. In order to promote exploration and the accidental discovery of new information resources, it was also emphasized how important it is to prioritize suggestion diversity and maximize user interaction through active participation and feedback.

Artificial Intelligence (AI) is being used in a growing number of Human Resources (HR) roles. The purpose of this study is to learn how various specialists from various organizations, including managers, supervisors, project managers, and human resource managers, view the potential of artificial intelligence-based recommender systems to match employee profiles with job profiles. This study notably uses a Delphi study-based technique, assembling an expert panel to offer their perspectives by scoring and commenting on a series of ideas. This research attempts to uncover the difficulties associated with matching employee and job profiles using artificial intelligence and machine learning technologies in the form of recommender systems, based on the findings of the online Delphi survey and participant perspectives. In this study, we have examined the many obstacles that arise when trying to match job profiles with employee profiles, as well as the contemporary issues that CEOs, HR staff, and supervisors—such as project managers—face in an organization. The study also highlights the possibility or viability of using artificial intelligence to create recommender systems, where we test a few hypotheses centered on potential fixes and different difficulties in matching job profiles inside an organization with employee profiles.

Many industries, including robotics, gaming, healthcare, and education, use facial expression recognition (FER). With the use of facial expression methods, an artificially intelligent interactive robot can identify human faces, sense the emotions of the person it is speaking with, and utilize those feelings to select the right response. Playing music based on the user's mood is one use of facial expression recognition. We can infer the user's emotions by examining their facial expressions. Because existing emotion models struggle to accurately evaluate the relationship between music and facial expression, further research is needed to develop new ones. In this study, we use a deep learning technique based on Convolution Neural Networks (CNNs) to execute this sort of job. Compared to machine learning, deep learning is more efficient in analyzing unstructured data, movies, and other media. Through our study, we have developed a real-time system that can identify faces, gauge emotions, and even suggest songs to users. The datasets from FER-2013 and OAHEGA were used in the experimental investigation. We employed different combinations of these datasets to develop and train two emotion recognition algorithms. The accuracy of the suggested model is 73.02%. Six emotions may be predicted by our CNN model: neutral, sorrow, surprise, anger, fear, and joy. The suggested technique can be applied in several contexts where instantaneous facial recognition is crucial.

This paper proposes a cross-domain information fusion matrix decomposition algorithm to improve the accuracy of personalized recommendations in artificial intelligence recommendation systems, taking into account the difficulties associated with inter-domain information fusion and data sparsity in collaborative filtering algorithms. First, social network data and Douban movie ratings are gathered for the study. Levenshtein distance detection is used to eliminate duplicate scores in order to maintain data integrity, and natural language processing technology is used to extract keywords and subject information from social communications. Additionally, discrete user and movie information is converted into binary matrices using a novel thermal coding technique, and user relationships are converted into feature vectors using graph convolutional networks. The Ridge regularization technique is presented to progressively optimize possible feature vectors in order to avoid overfitting. Then, characteristics from various areas are integrated using weighted average and feature connection approaches. Additionally, the study creates tailored suggestion lists by merging user attributes with an item-based collaborative filtering algorithm. Cross-domain information fusion optimization is carried out in the paper's experimental stage on four popular mathematical matrix decomposition algorithms: latent factor model (LFM), non-negative matrix decomposition, singular value decomposition, and alternating least squares approach. These algorithms are contrasted with the non-fused method. With mean absolute error and root mean squared error decreasing by 12.8% and 13.2%, respectively, among the four methods, the results show a notable increase in score accuracy. Additionally, the ranking accuracy coverage of the LFM method grows by 54.2% and the average F1 score reaches 0.97 when k = 10. Overall, there are noticeable benefits in terms of accuracy, prediction performance, recommendation diversity, and ranking quality when the mathematical matrix decomposition technique is paired with cross-domain information fusion. Additionally, the recommendation system's accuracy and variety are enhanced. Through the integration of many strategies, it successfully addresses collaborative filtering difficulties and greatly outperforms standard models in terms of suggestion variety and accuracy.

Over the past few years, the academic and scientific community has turned its attention to video games, with a particular emphasis on the development and testing of Artificial General Intelligence (AGI). AGI experimental platforms enable the visual analysis and study of the behavior of various AI agents that have previously been specified. This study presents GAGI, a revolutionary gaming engine that may be used as an experimental platform for artificial intelligence. GAGI is a game engine that uses the C++ programming language to develop and produce innovative 2D and 3D video games. Furthermore, within the generated game, GAGI offers the user a unique setting for researching and modeling AI agents. It is possible for users to interact with many AI agents in real time when they are deployed, which enhances comprehension of their behaviors and interactions. The benefits of the suggested software's design capabilities and AI support are highlighted by contrasting its characteristics with those of other popular game engines utilized by the academic community and the video game industry. Additionally, GAGI provides the ability to replicate the studies, providing the scientific community with a multitude of options.

When combined with Deep Learning (DL), Monte Carlo Tree Search (MCTS) is an effective empirical search technique for agent decision-making, particularly when it comes to beating previously unbeatable board games. However, as real-time video games are often made for human players and thus need a large amount of resources for simulation, it does not seem to be as effective in this area, where the simulation time limit for exploration is a critical consideration. In this research, we offer a surrogate-assisted MCTS strategy that uses a deep-learning-based surrogate model to approximate gaming results, particularly aimed at commercial real-time video games. Our work's primary contribution is the modified MCTS we created for real-time, commercial video game processing. Our work might be seen as having pushed the realm unexplored by previous research, as commercial video games, in comparison to their non-commercial analogs, include far more complicated and dynamic gameplays to satisfy their market customers. By comparing our approach to other algorithms, such as the conventional MCTS, in the context of a for-profit real-time video game, we were able to verify its effectiveness.

It is still debatable if using exergames in physical education (PE) classes can greatly increase student performance in the subject. This review investigates the ways in which exergames might enhance student learning of physical education as well as its promotional influence. Two researchers independently searched the ProQuest, EBSCO, Web of Science (WoS), PubMed, Chinese National Knowledge Infrastructure (CNKI), Wanfang, and VIP databases using the PICOS method. They then assessed the quality of the included literature using the Cochrane system evaluation manual and conducted a meta-analysis of the included literature. This analysis comprised a total of 16 randomized controlled trials with 2962 participants. Exergames significantly increased student performance in PE learning, according to the meta-analysis (SMD = 0.45, 95% CI: 0.27–0.63, P < 0.00001). A subgroup study revealed that using exergames for a duration of 1-2 months in small kindergarten groups might provide superior outcomes.

Artificial Intelligence (AI) is one of the most important innovations that has permeated both our daily lives and industrial processes. Its quick development portends revolutionary effects in a number of areas, from cutting-edge businesses to regular people's lives. AI is continuously improving human experiences by modifying interactions and enhancing capacities. For example, modern educational institutions use facial recognition technology to track attendance using AI algorithms. In the future, autonomous vehicles—where cars completely rely on AI systems for navigation, traffic signal detection, and route navigation—represent the ultimate use of artificial intelligence.

Scholars studying international relations have long highlighted the influence of popular culture on public perceptions and political reality. This article examines these possibilities in relation to videogames with a military theme and how weaponized artificial intelligence (AI) is portrayed in them. We identify distortions of human-machine interaction that contradict real-world scenarios within paradoxical videogame representations of AI weapons, both as easy targets that human protagonists routinely overcome in gameplay and as insurmountable enemies that pose existential threats to humankind in narratives. These fallacies center on the idea that videogames give players more agency over AI weaponry in order to provide fun gameplay, even if the same weapons are designed to reduce human agency in actual combat. We clarify how these skewed representations of AI weaponry are created by entanglements between diverse human and non-human actors that want to make videogames lucrative and mass-marketable by utilizing the Actor-Network Theory idea of translation. By doing this, we are in line with game studies research that demands that the commercial and ludic aspects of videogames be given more consideration so that international relations literature may more fully take into account pop cultures' limited capacity to influence public perceptions and political realities.

Precise scientific fields like as biomechanics, genetics, ethology, and neurology depend on precisely following animal behavior throughout research, especially when markers are not used. But extracting exact views from constantly changing surroundings has proven to be challenging. We just released an open-source toolbox that uses a state-of-the-art human position estimation method. This toolkit allows users to train a deep neural network to track features with an accuracy close to human labeling, even for user-defined characteristics. To this updated Python package, we have included new features such as graphical user interfaces (GUIs), performance gains, and network refinement based on active learning. To assist clients in developing a distinct and replicable analytical pipeline through the utilization of a graphics processing unit (GPU).

To keep players interested in a game, the difficulty level should be just right. One popular method for dynamically changing game elements to maximize player experience is called Dynamic Difficulty Adjustment (DDA). This study examines the literature on methods for changing the difficulty of video games according on a player's performance, feelings, or personality. In order to do this, we looked into DDA research that used player modeling strategies, machine learning techniques, data kinds for evaluating players' states, testbed game genres, and applications. The review's data sources included publications from conferences and journals that were published until September 2022. According to the results, the majority of research has demonstrated that DDA significantly affects variables like enjoyment, flow, motivation, engagement, and immersion. Furthermore, player modeling and machine learning approaches have also drawn increased interest in DDA design. However, given the growing popularity of games across a range of industries, further study is required to better understand player preferences and effectively modify game characteristics. Better understanding of players' preferences will be achievable by more study on players' cognitive traits, such as visual attention, working memory, and response speed.

Because they mimic real-life issues and circumstances, serious video games offer an immersive learning environment for farmers. However, there is little actual data to support their efficacy. In order to highlight research trends and identify gaps, this scoping review summarizes the literature on serious video games for agricultural learning in accordance with PRISMA-ScR principles. In order to find publications on serious video games for agriculture learning published between January 2000 and July 2022, we conducted a thorough search across nine reputable academic databases. Data extraction, screening, and narrative synthesis of the gathered data were carried out by two impartial reviewers. 3,297 articles were found in the first search; of these, 0.58% (n = 19) were included in the review. The majority of the games that have been evaluated were launched during the previous five years, mostly on mobile platforms. They frequently used a simulation-based methodology, had two-dimensional visuals, and were intended for single-player gameplay. These games, which emphasize agricultural production and sustainable agriculture, are primarily aimed at students. The research frequently lacked specific educational philosophies. Pilot studies were the main component of evaluation methods, with an emphasis on improving knowledge and user experience. These studies frequently showed positive effects, including enhanced user experiences, knowledge, and changes in attitude and behavior. This report showcases developments over the past 20 years in the use of serious video games for agricultural education. It does, however, emphasize the necessity of more research on how game aspects affect user experience and efficacy. Improving theoretical underpinnings and instructional strategies is crucial, as is developing games for players from marginalized groups and with particular farming difficulties. For the purpose of evaluating game efficacy over the short, medium, and long terms, rigorous study designs are essential.

With the advancement of both education and technology, educators have come to understand that games shouldn't be limited to students' personal amusement. Better learning results can be obtained by integrating games into instructional materials. On the other hand, relevant materials are continually appearing online. A knowledge graph-based personalized recommendation strategy for instructional video game materials is suggested in order to produce recommendations of a higher caliber. First, feature extraction is done on both the object and user sides in turn. Next, a hidden Markov model based on the dual end neighbor technique is shown. The model is optimized taking into account the user's temporal characteristics. The optimized model mines users' prospective preferences while accounting for their short- and long-term preferences. The developed model's hit rate index value is determined to be 0.7989 by experimental research. The broken line's adjusted cumulative gain value is 0.6045. Over 89% of people are happy with this model's suggestion. The duration is 0.2863 seconds. Users will have a more convenient and effective online experience with the built-in model's ability to propose instructional video game resources in an efficient and high-quality manner.

A fascinating new paradigm for virtual collaboration and human-computer interaction (HCI) is the metaverse. In order to close the gap in the current literature, this study provides a thorough analysis of the metaverse, reviewing its components and nature from a human-centric standpoint. First, we outline the main affordances of the metaverse and compile a definition from the body of current research. We then provide a comprehensive framework that includes applications in many fields, the nature of the metaverse, input/output technologies, and infrastructure technologies that support multi-sensory HCI. This framework's components are thoroughly discussed, providing insights into the nature of the metaverse and the state of preparation of existing technologies. Based on this thorough analysis, we identify the main unresolved issues and suggest viable paths that need more research and development. This study offers crucial insights and is a priceless tool for metaverse developers and academics striving to progress this revolutionary new medium by outlining the metaverse's goal and defining the components needed to make it a reality.

The advent of deep learning (DL), machine learning (ML), and artificial intelligence (AI) technologies in recent years has brought about a dramatic shift in the way of living in modern civilization. Artificial intelligence is a multifaceted technology that includes ML, DL, and sophisticated algorithms, among other components. In the near future, ophthalmologists should be able to use automated devices from AI, ML, and DL to diagnose and treat eye problems promptly. In fact, intraocular lens calculations, image reading, corneal topography mapping, and illness diagnostic validation have all been accomplished in the ophthalmology field using AI, ML, and DL. Globally, age-related macular degeneration (AMD), glaucoma, and diabetic retinopathy (DR) are the three most prevalent causes of permanent blindness. Many diseases, including as DR, AMD, glaucoma, and other ocular ailments, may be objectively diagnosed and their course can be tracked by ophthalmic imaging. In ophthalmic practice, optical coherence tomography (OCT) and fundus digital photography are the two imaging modalities employed for diagnostic purposes. Notably, OCT has emerged as the most used imaging modality in developed world ophthalmology settings. The need for these pictures is growing due to changes in the population's demography and lifestyle, an increase in average lifespan, and shifts in the prevalence of chronic illnesses such glaucoma, diabetes, DR, AMD, and obesity. Additionally, a significant issue in many nations is the scarcity of retina experts and qualified human graders. As a result, it is obvious that processing such photos will be expensive, time-consuming, and prone to human error given the present trends in population increase. Consequently, it will become unavoidable in the near future to use unmanned automated applications systems for the diagnosis and treatment of DR, AMD, glaucoma, and other ocular illnesses. We give a summary of the possible effects of the existing AI, ML, and DL techniques and their applications on ocular illness early diagnosis and therapy, including glaucoma, AMD, DR, and glaucoma.

Artificial intelligence (AI) and machine learning (ML) have the potential to revolutionize medical treatment due to the unparalleled progress in data aggregation and deep learning algorithms. Particularly in the area of orthopedics, big data may be leveraged to enhance the many aspects of treatment that orthopedic surgeons give by offering vital insights. This review's objectives are to critically assess the most current and innovative orthopedics literature on machine learning (ML) and discuss how it can affect musculoskeletal treatment in the future.

By emphasizing the ideas and technologies of Industry 4.0, which emphasize interconnection, digitization, and automation, it is ensured that micro- and macro-economic entities continue to expand. Within this framework, projects pertaining to Smart Production and Smart Logistics are considered to be greatly facilitated by artificial intelligence. This study does a thorough analysis of the scientific literature on deep learning, machine learning, and artificial intelligence with a focus on smart logistics management in commercial settings. In addition, the authors present a conceptual framework based on the systematic literature review results, which offers valuable implications based on current research findings and insights to be used for initiating and directing future research initiatives in the fields of deep learning (DL), machine learning (ML), and artificial intelligence (AI) in smart logistics.

Artificial intelligence in the form of machine learning (ML) has the potential to revolutionize the twenty-first century. Growing dataset sizes and recent, quick advancements in the underlying architecture and techniques of computers have improved computer proficiency in many domains. These include operating a car, translating across languages, using chatbots, and outperforming humans at challenging board games like Go. Here, we go over the principles and techniques behind machine learning and highlight particular methods of optimization and learning. The uses of ML in medicine are then summarized. Specifically, we highlight recent diagnostic accomplishments—as well as cautions—in the areas of pathology, radiography, dermatology, and general microscopy.

In recent years, advances in machine learning, deep learning, and artificial intelligence have completely changed the area of advanced robotics. The fields of advanced robotics are changing as a result of AI, ML, and DL, which are improving robot intelligence, efficiency, and ability to adapt to challenging jobs and surroundings. In advanced robotics, AI, ML, and DL are used in a variety of applications such as natural language processing, autonomous navigation, object identification and manipulation, and predictive maintenance. Collaborative robots, or cobots, are being developed using these technologies to work alongside people and adjust to changing jobs and circumstances. In order to give passengers and transportation businesses safety, efficiency, and convenience, sophisticated transportation systems can make use of AI, ML, and DL. Additionally, the development of factory assembly robots is greatly aided by AI, ML, and DL, which allows the robots to operate more effectively, safely, and intelligently. They also have a wide range of uses in aviation management, which aids airlines in increasing productivity, cutting expenses, and raising customer happiness. Additionally, taxi businesses may benefit from the use of AI, ML, and DL in order to provide their clients safer, better, and more effective services. The paper addresses several applications of the systems in robot modification and provides an overview of recent advances in AI, ML, and DL in advanced robotics systems. To close the gaps between current studies and published papers, more study on the uses of AI, ML, and DL in advanced robotics systems is also recommended. It is feasible to research and alter the performances of advanced robots in various applications in order to improve productivity in advanced robotic industries by analyzing the applications of AI, ML, and DL in advanced robotics systems.

Recent years have seen a notable advancement in the commercial use of artificial intelligence and machine learning, especially in fields like textual analysis, picture identification, natural voice processing, language translation, and self-learning. These fields had previously seen a lack of progress, making it seem as though intellect was a need for these abilities. These commercial advancements, however, have shown their optimum performance in single-task applications when occasional frank mistakes and unsatisfactory outputs are acceptable. Anesthesiology is not like other fields of medicine. Rather than being a single cognitive act, it incorporates a demand for high dependability as well as a demanding cycle of interpretation, physical action, and reaction. For the practicing anesthesiologist, this overview explains the fundamentals of artificial intelligence and machine learning and shows how basic equations may produce decision-making behaviors. The introduction of pertinent clinical issues demonstrates how machine learning may be used to address them, perhaps ushering in a new age of machine-assisted research in the field of anesthesiology.

Innovation and adaptation are critical to the industrial sector. New technologies should enable sustainable production as a result of this advancement. Global perspectives on smart production application technologies are necessary to advance sustainability through smart production. In order to achieve sustainable manufacturing, a variety of AI-based approaches, including machine learning, have already been created in the sector owing to significant research efforts in the field of artificial intelligence (AI). Therefore, the current study set out to conduct a thorough analysis of the scientific literature about the industrial applications of machine learning (ML) and artificial intelligence (AI). In reality, with the advent of Industry 4.0, machine learning and artificial intelligence are seen as the main forces behind the transformation in smart factories. Classifying the literature by publication year, authors, scientific sector, nation, institution, and keywords was the aim of this review. The SCOPUS database and Web of Science were used for the analysis. Moreover, NVivo 12 and UCINET software were utilized to finish them. In order to show how the field has changed from 1999 to the present, a study of the literature on ML and AI empirical investigations produced in the past century was done. Eighty-two papers underwent classification and evaluation. The first noteworthy outcome is the higher volume of American-published publications and the growing interest following the introduction of Industry 4.0.

The chronic, complex disorders known as autoimmune diseases. Finding patterns in medical data and using them to forecast patient outcomes for better clinical care is achievable using machine learning (ML), a subfield of artificial intelligence. Here, we reviewed the use of machine learning techniques to autoimmune disease clinical issues. MEDLINE, embase, and the whole databases for computers and applied sciences were used to conduct a systematic review. "Artificial intelligence" or "machine learning" together with the search term(s) for autoimmune disorders in the title, abstract, or key phrases were included in pertinent publications. Exclusion criteria included publications before 2001, non-autoimmune disease comorbidity research and review papers, studies not written in English, and no genuine human patient data. Out of 702 studies, 169 satisfied the inclusion criteria. The most widely utilized machine learning techniques were random forests and support vector machines. The most prevalent ML models used data on inflammatory bowel illness, rheumatoid arthritis, and multiple sclerosis. Only a little percentage of research (7.7%, or 13/169) integrated several forms of data during the modeling procedure. In 8.3% of publications (14/169), cross-validation was supplemented with an additional testing set for a more thorough model assessment. Adopting best practices for ML model validation, cross-validation, and independent testing may be beneficial for the discipline. In straightforward circumstances, several models produced good prediction outcomes (e.g., categorization of cases and controls). Future advancements in prediction model complexity might be attained by integrating various data kinds.

Research on drug creation and development is crucial for chemical scientists and pharmaceutical businesses. However, there are obstacles and difficulties that affect medication design and development, such as low effectiveness, off-target delivery, time consumption, and excessive cost. Big and complicated data from clinical trials, proteomics, microarray, and genomes all represent a challenge to the drug discovery process. Drug research and discovery heavily rely on artificial intelligence and machine learning technologies. Stated differently, the field has been brought up to date by deep learning algorithms and artificial neural networks. Numerous drug discovery processes, including peptide synthesis, ligand- and structure-based virtual screening, toxicity prediction, drug monitoring and release, pharmacophore modeling, quantitative structure–activity relationship, drug repositioning, polypharmacology, and physiochemical activity, have made use of machine learning and deep learning algorithms. Historical data supports the use of deep learning and artificial intelligence in this domain. Furthermore, newly created modeling algorithms received crucial help from innovative data mining, curation, and management strategies. In conclusion, developments in deep learning and artificial intelligence present a great chance for a methodical approach to medication discovery and design that will ultimately benefit humanity.

The term artificial intelligence (AI) has gained a lot of traction recently due to revolutionary developments in technology and remarkable experimental outcomes, particularly in the area of image processing and analysis. Specialties in medicine that rely heavily on pictures, such as radiology, pathology, or cancer, have taken advantage of this and invested significant resources in research and development to bring AI's promise to clinical settings. As artificial intelligence (AI) gains popularity for common medical imaging analytic tasks including diagnosis, segmentation, and classification, knowledgeable practitioners are crucial to the safe and effective usage of clinical AI applications. This review's objective is to outline the fundamental technological underpinnings of artificial intelligence (AI), as well as cutting-edge machine learning techniques and how they relate to medical imaging. We also talk about the newest developments and potential paths for future study. This will make it easier for the reader to comprehend how AI techniques are now a necessary part of every workflow for medical image processing and open the door for the application of AI-based solutions in clinical settings.