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ABSTRACT PROCEEDINGS

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Investigation of Cyber security Risk associated with ChatGPT and its Multimedia limitation

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Abstract:

The growing popularity of large language models, such as ChatGPT, has allowed the design of extremely sophisticated chatbots that can copycat human conversations with remarkable accuracy. However, the use of these chatbots also poses significant cyber risks that must be addressed. This research paper pursues to investigate the cyber risks associated with the use of ChatGPT, including potential vulnerabilities that could be exploited by malicious actors. In this research, an investigation was conducted to explore the cyber security risks connected with AI-based chatbots like ChatGPT. Chat GPT has the ability to create text-based content, but it does not have the capability to directly generate visual or multimedia content. Microsoft has made important progress by developing Visual ChatGPT, a language model that generates coherent and contextually appropriate responses to image-based prompts.

Keywords: Artificial Intelligence (AI), ChatGPT, Cyber security, Natural Language Processing (NLP), Multimedia, Visual ChatGPT

The Impact of Motor Fitness on Sports Participation and Development of New Sports in North-eastern States of India

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Abstract: Physical fitness plays a key role in shaping sports participation and nurturing the growth of new sports. This research paper explores the relationship between motor fitness and sports engagement in the North-Eastern states of India. North-East India is a region known for its rich cultural diversity and unique traditions. While cricket has historically dominated the sporting landscape in India, these states exhibit a diverse range of indigenous sports and athletic practices. The paper aims to explore how improvements in motor fitness can drive higher sports participation and the development of new sports in this region. The study discusses the potential for introducing and popularizing new sports based on students' fitness levels. The study had a mixed-methods research approach. Quantitative data on motor fitness levels were collected through standardized fitness tests conducted among secondary school children and Qualitative data were obtained through interviews with physical education instructors, coaches, and students. The findings of this research highlight the intrinsic connection between motor fitness, sports participation, and the potential for the development of new sports in North-East India. Improved motor fitness can increase sports engagement among students, thereby encouraging a culture of physical activity. Moreover, the region's rich cultural tapestry offers a wealth of opportunities for inventing sports that resonate with the local population. This research serves as a call to action for educational institutions, sports authorities, and community leaders to collaborate in nurturing a vibrant sports culture that influences the unique strengths of North-East India.

Keywords: Sports Participation; Secondary School Children; Motor Fitness; North-East India; Sports Development; Fitness Test.

Perceived Usefulness and Perceived Ease of Use in the Worth of Online Education System in Bangladesh

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Abstract: The prevalence of online education has experienced significant growth in tandem with the widespread adoption of digital technology across various domains. The primary factor for transforming the education sector into an entirely virtual format is the significant increase and influence of digitalisation, which the recent global pandemic has accelerated. This study examines the perceptions of perceived usefulness and perceived ease of use about the value of online education systems while also considering the implications of their adoption in Bangladesh. Furthermore, this study examines the relationship between perceived ease of use and the worth of online education usages, focusing on the mediating role of perceived usefulness. This investigation incorporates the diffusion of technology adoption theory to provide a comprehensive analysis. It examines the broader scope of the online education system, including its perceived usefulness and ease of use. The literature review examines the several components associated with the online education system, focusing on the positive and negative effects of perceived ease of use and perceived usefulness on online education. This work employs the SEM-AMOES technique to investigate the direct and mediated interactions among the hypothesised components. The sample utilised in this study was obtained through multistage cluster sampling. It consisted of 286 respondents, which was reduced to 265 after screening and sorting due to the presence of partial or missing data. Due to their high population density and diverse cultural characteristics, the study focused on two major cities in Bangladesh, Dhaka, and Chittagong. The research sample was selected to ensure representativeness and minimise potential biases by considering several criteria, such as gender, age, and education. The correlation between online education's perceived usefulness and worth has been significant. The findings indicate that each of the variables evaluated significantly impacts the worth of online education.

Keyword:: Perceived Usefulness, Perceived Ease of Use, Online Education System in Bangladesh, and technology adoption in online education

An investigative study of artificial intelligence on automation of pharmacovigilance process based on cost, benefit, risk and opportunity

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Abstract: Drug Safety has been an important process in the world of pharmaceuticals. Pharmacovigilance is the process which encapsulates the entire drug safety process consisting of multiple steps and sub processes. Artificial intelligence along with machine learning offers a great opportunity to automate and increase the efficiency of pharmacovigilance. Starting from collecting the adverse events then assessment and finally reporting, every step has an opportunity to benefit from Artificial Intelligence. It can also provide a lot of augmented solutions to problems like early signal detection for any adverse events related to the pharmaceutical products. This study aims to investigate and identify various artificial intelligence algorithms and machine learning models that can be applied throughout the lifecycle of a case event processing. It also evaluates the effort, benefit and any risk involved in the state of the case life cycle.

Keywords: Pharmacovigilance, Artificial Intelligence, Machine Learning, ICSR Automation, ML Models

Problems and Prospects of Small Tea Growers in Jorhat District-A Case Study

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Abstract: The small tea growers are a crucial and essential component of Assam's tea economy. Some of the factors that encouraged small and marginal farmers as well as the unemployed to start a tea plantation in Assam included the prevalence of lot of high land with good drainage, the availability of proven agro-technologically skilled labour, existence of the established and assured green leaf market, the advantages of a perennial plantation crop in comparison to the other seasonal, annual or biennial agricultural crops, the blessings of favourable climatic and soil conditions. This industry had extraordinary growth because it quickly took on the characteristics of a socio-economic revolution and served as a catalyst for social change in the state.It resulted in the construction of numerous tea factories in the small-scale industrial sector, creating job possibilities on the region's tea estates. The Jorhat district's small tea growing industry has enormous potential in terms of creating jobs, making money, and raising social standing. It can be a rewarding career and be extremely important in enhancing the socioeconomic standing of the economically underdeveloped region. The study's findings show that small tea growers encounter a variety of issues with regard to receiving support from organizations, having access to financing, maintaining production, processing and marketing tea leaves, etc. Therefore, the topic titled as the Problems and Prospects of the small tea growers in Jorhat district has taken up for the study and further investigation.

India's Legal Banking Framework: A Chronological and Logical Study

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Abstract: India has a long history of banking regulations, with the establishment of the Reserve Bank of India in 1934 and the enactment of the Banking Regulation Act in 1949 being the key milestones. While there were legislations pertaining to banking affairs before and after the establishment of RBI and before and after independence, the actual concept of banking business was formalized with the enactment of the Reserve Bank of India Act in 1934. Although earlier legislations such as the Negotiable Instruments Act of 1881 and the Banker Books Evidence Act of 1891 were relevant to the banking industry, they did not cover the entire concept of pure banking. The government passed several other Acts, such as the IFCI Act of 1948, the Export-Import Bank of India Act of 1981, the NABARD Act of 1981,and many more to address banking affairs. Each legislative effort had its own logic and created a chronology of the banking history of India. This study aims to examine the chronology of the banking history of India, and the rationale behind the enactments including all regulations from pre-independence to post-independence periods, in order to provide a comprehensive understanding of India's legal banking framework.

Crime analysis through machine learning: Bangladesh perspective

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Abstract: The crime rate of Bangladesh is rapidly increasing with its growing population which is affecting human lives and society negatively. With the evolution of the society the types, patterns and trends of the crime is also changing and becoming more complex day by day. To get the best results it has become a crucial task to analyze the crime data for understanding the future trends or patterns. Analyzing crime data has become an extensive process that yields valuable insights for law enforcement. Machine Learning methods can perform a remarkable role in disclosing the future trends or patterns of crime. This paper illustrates Machine-Learning based crime analysis. Here, Bangladesh crime data for last 9 years is analyzed using different means of data-processing. Various Machine Learning regression models are implemented such as Linear, Polynomial, Random Forest, Decision Tree, K-Nearest-Neighbour, Extra Tree and Elastic Net Regression. Finally, it is discerned that Extra Tree, Elastic Net and Linear Regression provides a better accuracy in analyzing and predicting crimes of Bangladesh when the training and testing are 62% and 38%. The purpose of crime analysis is to support or assist the officials to minimize and control the occurrence of crimes in near future. This analysis may assist Bangladesh Police and law enforcement agencies or authorities to predict, solve and prevent future crimes.

A Study on Why do the Digital Application Developers in Bangladesh Believe that 'Prevention is Better than Remedy' When it Comes to the digital privacy on Children and Adolescents?

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Abstract: Children's and teenagers' digital privacy and security are among the least mentioned topics in Bangladesh and the global south. Where mature and adult individuals are largely unaware of best practices for utilizing digital gadgets and tools, one can hardly expect youngsters to be any better. The act of sharing personal information about minors online raises serious concerns about the possibility of exploitation. Advertisers and social media platforms frequently exploit this shared data to collect user data, allowing them to customize personalized adverts and, in some cases, bombard consumers with unwelcome communications [1]. So far, research has focused on raising awareness and implementing best practices in this area from the perspectives of parents and children [2,3]. This paper demonstrates that digital application developers may play an essential role in the design and development of services. They can provide an additional protection or layer of engagement, particularly for commonly used apps. These include determining age based on speech and/or image recognition, remote monitoring of children's communication, keyword-based surveillance, AI-based usage tracking, and so on. Our research suggests that this can improve privacy and security in general, as well as raise awareness among parents and children. Our research also demonstrated that understanding local culture and norms might occasionally help children stay safe in the virtual realm.

Keywords: Children, Privacy, Digital tools, App Developers, Cyber Awareness

Developing a Network-Independent Accurate Smart Energy Meter with Real-Time Data Sharing for Active Monitoring and Management of Consumption

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Abstract: Energy in era of modern civilization, its precise measurement and efficient utilization are paramount. However, traditional energy metering systems have long grappled with issues of inaccuracy, delayed billing, and the labour-intensive process of manual meter reading. These challenges pose financial burdens and hinder optimal energy consumption. We address these persistent issues by introducing an accurate energy metering and management system with real time data monitoring capability for both user and service provider. At the core of this revolutionary energy metering solution lies an ESP8266 microcontroller, seamlessly integrated with a PZEM-004T sensor, a current transformer, and a Miniature Circuit Breaker (MCB). The PZEM-004T sensor, in tandem with the current transformer coil, serves as a comprehensive unit for measuring vital electrical parameters, including voltage, current, active power, and power consumption (kWh). The ESP8266 microcontroller functions as the system's central hub, collecting and processing data from these sensors, and facilitating real-time data transmission to user's devices using the Wi-Fi technology and uploading it to the server which help the service provider to monitor the abnormal power consumption and detect possible energy theft to take necessary actions. The implemented energy metering system has demonstrated remarkable efficiency and accuracy in measuring energy consumption. Through the integration of the ESP8266 microcontroller and PZEM-004T sensor, voltage, current, and power factor were measured with accuracy of 99.5% which lies under the category of Class A Energy Meter as per Government Standard. This enhanced accuracy ensures that users receive highly reliable data regarding their energy usage, contributing to improved decision-making and optimized energy consumption. One of the standout achievements of the system is its ability to provide real-time energy consumption data. Users can now access up-to-the-minute information on their energy usage through their smartphones or personal computers. This real-time measurement capability empowers consumers to make immediate adjustments to their energy consumption habits, fostering greater awareness and control. Additionally, the system facilitates seamless data transmission to the electricity distribution board, enabling more efficient management of energy resources and demand. The integration of these real-time measurement features marks a significant advancement in energy management technology, with implications for both individual users and the broader energy ecosystem.

Keywords: Smart Energy Meter, Energy management, ESP8266, PZEM004T, Current Sensor.

Exploring Speaker Adaptation Techniques in Speech-Based Disaster Management Systems: A Comprehensive Investigation

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Abstract: Disaster management systems are essential tools for ensuring that communities can respond effectively to natural disasters and other emergencies. These systems leverage advanced technologies and data analytics to help emergency responders and government officials make informed decisions and take prompt action in the face of a crisis. One key challenge faced by disaster management systems is the need for speaker adaptation. In many cases, these systems rely on voice recognition and natural language processing technologies to process and analyze incoming data from emergency calls, social media, and other sources. However, these systems may not be able to accurately recognize speech from all speakers, particularly those with non-standard accents or who are speaking in noisy or chaotic environments. In this paper we give a brief a survey on speech based disaster management system, challenges in speaker adaption system and traditional vs recent speaker adaptation approaches.

Developing an Assamese AI Chatbot for Educational Institutions using Bi-GRU Model

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Abstract: AI chatbots are useful for providing educational resources in regional language, but face challenges due to scarcity of data available for public in internet platform. This paper describes the development of Assamese AI chatbot for Educational Institution. Assamese is one of the languages spoken in the north east state of India. In this paper we have presented the Bi-GRU model for Assamese chatbot. The paper compares the performance of the Bi-GRU model with other model such as FFNN, RNN, LSTM and GRU and reports that the Bi-GRU model achieved the highest accuracy of 89.87%. This paper also describes the development of dataset for Assamese language, which was used to train and test the chatbot. This paper also discusses the challenges and limitations of developing an AI chatbot in Assamese language and suggests some directions for the future research.

A Comparative Study of Detection of Various Eye Disease Using Deep Learning Methods

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Abstract: Eye disease detection is a challenging task. Even though a lot of research has been carried out in the field of eye disease detection, it can still be said to be in nascent stage. Detection of eye diseases like diabetic retinopathy (DR), diabetic macular edema (DME), glaucoma (GI) and cataract (Ca) is the need of the hour. The research that is carried out in the field of eye disease is mainly targeted for only one eye disease or two in some cases using retinal images. In this paper, we will be doing a comparative study of the research done on the above-mentioned eye diseases and select the best deep learning techniques like convolutional neural network to train and test these models by using retinal images. These selected models will be used to further create an eye disease detection system to detect diabetic retinopathy (DR), diabetic macular edema (DME), glaucoma (GI) and cataract (Ca) eye diseases.

Keywords: Image processing, Medical images, Eye disease detection, Diabetic retinopathy, Diabetic macular edema, Glaucoma, Cataract

Education and Learning Technology: It's Importance in Teacher Training Institution

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Abstract: In the ever-evolving landscape of education, the integration of technology has become imperative, reshaping the way students learn and teachers instruct. Teacher training institutions are at the forefront of this transformation, recognizing the significance of education and learning technology in preparing educators for the 21st century.

The adoption of technology in teacher training institutions is a multifaceted concept, encompassing a wide array of tools and methodologies. This area of study delves into the importance of technology in these institutions, highlighting its role in enhancing teacher preparation. Technology fosters personalized learning experiences. Through the use of digital resources, teachers-in-training can access a wealth of instructional materials and tailor their learning to their needs. Online platforms, interactive simulations, and educational software allow for individualized learning paths, promoting a deeper understanding of pedagogical concepts. Technology equips future educators with the skills necessary to engage tech-savvy students. As classrooms become increasingly digitized, teachers must be proficient in educational technology to create a dynamic and interactive learning environment. Teacher training institutions must impart these skills to ensure that graduates are well-prepared to meet the demands of modern classrooms. Another vital aspect is the ability of technology to bridge geographical and cultural divides. Online platforms enable collaboration and communication between students and educators from diverse backgrounds, fostering a global perspective on education. This interconnectivity broadens the horizons of teacher trainees and promotes inclusivity in teaching methods. Moreover, the importance of data-driven decision-making cannot be overstated. Education technology provides tools for collecting, analyzing, and interpreting student data. Teacher training institutions can train educators to use this data to monitor student progress, identify learning gaps, and adapt instruction accordingly, thereby improving the overall quality of education.

Education and learning technology is of paramount importance in teacher training institutions. Its role in providing personalized learning experiences, preparing teachers for the digital era, promoting global collaboration, and facilitating data-driven decision-making cannot be understated. Teacher training institutions that embrace technology stand at the vanguard of educational advancement, ensuring that future educators are well-equipped to meet the evolving needs of the 21st-century classroom.

Study of Amphibian Abundance and Habitat Selection in Nongkhyllem Wildlife Sanctuary of Meghalaya, India

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Abstract: A study was conducted to find out the amphibian abundance and species-specific habitat selection pattern in Nongkhyllem Wildlife Sanctuary of Meghalaya, India during 2022-23. Extensive survey was done during evening hours using the existing forest trails for terrestrial habitats and the aquatic bodies along with the riparian areas. Both *Visual Encounter Survey* and *Active Search methods* were followed and the number of individuals of each species was recorded with respect to their habitats. The study found 22 amphibian species belonging to five families, Bufonidae, Mycrohylidae, Dicroglossidae, Ranidae, and Rhacophorida, showcasing a diverse array of amphibian life. Among the documented amphibians, the study observed *Minervaryanepalensis*and *M. syhadrensis* as the most abundant and widely distributed amphibian in the sanctuary. The amphibian community structure revealed 55% males, 36% females, and immature (unsexed) 9 %. It was also observed that the 36.57% amphibian species exhibited preference for moist terrestrial habitat followed by 26.29% aquatic habitat; while, 37.14% of amphibian species preferred both riparian and aquatic habitats. Amphibian species in the protected area are facing several anthropogenic threats, deforestation (32.17%) being one of the major causes followed by agricultural practices (21.7%) and sand mining (14.78%). Awareness amongst the fringe villagers and participatory conservation and protection measures are immediately to be adopted for maintaining a healthy sustainable amphibian community

Spectral Properties of Complete and Cyclic Graphs and Their Application

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Abstract: In this paper, we investigate the various spectral properties of two classes of graphs: the Complete Graph K_n and the Cyclic Graph C_n; having n number of vertices with $n \geq 1$. We also explore the characteristic properties of the Laplacian matrix of complete and cyclic graphs, which are the sub-graphs of K_n. Spectral property in graph theory is the study of the properties of Laplacian matrix or adjacency matrix obtained from a graph. This paper primarily centres its attention on the relation between the eigenvalues of the Laplacian matrix and to establish the connectivity of a graph.

Computing Techniques in Health Care and Medical Science

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Abstract: Computer Science and technology now significantly improving the advance health care system. It is not only influencing medical research but also enhancing healthcare program and process to reach to more people at the same time people from rural and remote fringe area also getting same access of information of community medicine, prevention and social medicine. Interdisciplinary efforts between both the technique of computer science and medical science redefining the medical study and research which maintaining a balanced equilibrium across all the institute of the nation from the Institute of national importance to institute in semi urban area to the institute of the rural area. Medical science is a field which keep changing its data and develop everyday so updating all the updates from research work across the world, information technology playing now a great role to carry forward to all the doctors, scientists and healthcare stuff in prompt manner. Earlier all the print media printed books needed to make new edition after every single change of the data, which now a day's minimizing due to online editions. It is cost effect free medico. But at the same time, misinformation is also equally available on online resources, so it is very important to know the authenticity of the resources. In the field of investigation, computer programming contribution- is simply -immense contribution.

Machine Learning to Fog and Edge Computing:
A Survey and Threat Analysis

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Abstract: The traditional centralized cloud computing is facing significant difficulties due to the fast growth of mobile internet and Internet of Things applications. These challenges include delays in data transfer, low efficiency in utilizing available spectrum, and communication that cannot adapt according to the specific machine type. Driven by the determination to tackle these obstacles, a novel technology is causing a shift in the role of centralized cloud computing towards edge devices within networks. There has been a rise of various edge computing technologies from diverse origins, aiming to reduce latency, enhance SE (security and efficiency), and facilitate extensive communication between machines. Given the widespread growth and advancement of cloud technologies, the current cloud computing model is insufficient in meeting the essential needs for providing services to applications like smart grid, health-care systems, and augmented reality. These requirements include low latency, mobility support, and context awareness. Fog and edge computing have emerged as solutions that address these needs, offering exceptional performance and reliability. Machine learning involves identifying various aspects such as automated processes, improved decision assistance, and diagnostic capabilities within operational setups. This study reveals the existing study that focuses on various applications of machine learning, analyzing potential risks, and finding solutions related to the edge paradigm as a whole. It also emphasizes the unresolved problems and challenges that may persist in the coming decades.

Keywords: Cloud computing model, Fog computing, Edge computing, IoT, Vulnerabilities, Threats, Countermeasures.

An Empirical Look into Why Companies Go for Voluntary Delisting

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Abstract: The terms "listing, delisting, and relisting" serve as vital in dealing with the procurement of capital over stock exchanges. The Securities and Exchange Board of India's (SEBI) guidelines apply to both voluntary delisting, which firms have the choice to do, and mandatory delisting, which is governed by the operation of law. When a listed company disregards the guidelines set forth by the SEBI, the stock exchange in concern shall delist the company compulsorily at the SEBI's recommendation. Most often, smaller companies choose to voluntarily delist their stocks because they cannot afford the costs associated with listing fees, there is nominal trading on the stock exchange, or there is an opportunity for merger and amalgamation. Therefore, it is paramount to comprehend the exact reasons for the companies' voluntary delisting decisions. The cost of listing shares is objectively analyzed in the current study, along with listing fees for listed firms and projected listing costs for delisted companies.

Keywords: Voluntary Delisting Stocks, SEBI, Listing Cost, Projected Listing Cost, Merger and Amalgamation.

JEL Codes: G32, G38, G39, G39, G34

Block chain and its Application in Cloud & Edge Computing: A Survey

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Abstract: Block chain is the new emerging technology that can be used broadly. It is a distributed ledger system that enables for safe and transparent transaction recording. To maintain the privacy of the data we can implement block chain techniques. Cloud Computing is a fast-evolving technology to adapt new techniques. With the help of block chain, we can enhance the privacy of the cloud data centres. Nowadays, billions of data are present in cloud data centre. Cloud computing helps in avoiding the hectic maintenance of the server issues. Here, the different devices from different network can store data and application through the internet. These services are based on the pay per use policy. Cloud computing generally highly relies on its centralization computing, which is contradictive with decentralization setting of block chain. In block chain, information is stored and manages in a decentralized manner. Most decision are based on all the participating node of the networks spread all over the world. Edge computing is a new computing model that deploys computing and storage resources (such as cloudlets, micro data centres, or fog nodes, etc.) at the edge of the network closer to mobile devices or sensors. Cloud computing and edge computing are two technologies which provide rapid and simple access to computer resources over the internet. In this paper, we analyse and compare cloud and edge computing in terms of their benefits, drawbacks, obstacles, and potential for adopting block chain technology. We additionally take at multiple existing frameworks and models that combine block chain with cloud and edge computing for a wide range of applications such as Internet of Things (IoT), Industrial IoT (IoT), service monitoring, privacy protection, and resource allocation. At last, we will discuss some outstanding study refers to and future prospects in this increasing topic.

Keywords: Cloud Computing, Block chain, Edge Computing, Data Center, Internet of Things, Virtualization

A Comparative Analysis of Q-Learning and SARSA Algorithm for Computation Offloading in Edge Computing Environment

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Abstract

In the era of IoT and real-time data processing, edge computing has emerged as a key technology that allows devices to conduct activities closer to the data source, lowering latency and increasing system efficiency. A crucial component of edge computing is computation offloading, which entails choosing whether to carry out operations locally on the edge device or offload those to a distant cloud server. The optimization of computation offloading choices has drawn significant attention to reinforcement learning (RL) algorithms like Q-Learning and SARSA. In this study, Q-Learning and SARSA, two well-known RL algorithms, are compared and contrasted in the context of compute offloading in edge computing environment. The study examines how well these algorithms perform in relation to a number of critical variables, such as latency, energy use, and overall system effectiveness. We test the algorithms' adaptability to changing task demands and dynamic network circumstances in a simulated edge computing environment. According to our research, SARSA and Q-Learning both show significant advantages depending on the situation. When stability and predictable decision-making are important, Q-learning frequently performs well, but SARSA has promise when dealing with dynamic, uncertain network situations. In addition, the research analyses potential hybrid strategies that would combine the advantages of the two methods for better edge computing scenario decision-making.

Keywords: Computation offloading, Mobile Edge computing, Reinforcement learning,Q-learning,SARSA,

A Comparative Study on Artificial Intelligence Based Voice AssistanceSystemUsing Machine Learning

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Abstract

In the era of technological advancement, voice assistant systems have become an integral component of human-computer interaction, profoundly reshaping daily lifestyles. This paper is dedicated to the design and implementation of an Artificial Intelligence (AI)-based voice assistant system framework, leveraging AI methodologies. This paper harnesses Natural Language Processing (NLP) and speech recognition algorithms to facilitate seamless communication between users and various devices. Employing AI, the voice models assistant system enhances its ability to comprehend user inputs, accurately interpret user commands, and deliver contextually relevant responses. This paper explores a range of Machine Learning algorithms to enhance speech accuracy and language understanding and provide a comparative study and form a traditional taxonomy that aims to enhance user experiences by providing a more personalized, efficient, and interactive mode of interaction.

Keywords: Voice Assistant System, Machine Learning, Artificial Intelligence, Natural Language Processing (NLP).

Advanced Technologies in Self-Driving Vehicles: A Prototype Exploration

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Abstract: Self-driving cars, defined as autonomous vehicles capable of independent operation without human intervention, hold the potential to spearhead a technological revolution in the forthcoming decade. This study aims to elucidate the mechanisms by which self-driving cars circumvent accidents attributed to human drivers and how they navigate various environmental conditions, including traffic congestion and adverse weather. The prototype presented in this research employs a combination of hardware components, including Raspberry Pi and H-bridge drivers, as well as two DC motors, to facilitate vehicle automation. Several advanced technologies are integrated into the system, such as GPRS for location access, sonar sensors for obstacle detection and avoidance, image processing algorithms for pedestrian identification, stereo vision cameras for image processing, and machine learning algorithms for enhancing the intelligence of the autonomous system. Furthermore, the prototype leverages Google Maps to automate the car's route selection, prioritizing paths that are both free from traffic congestion and minimize travel distance. These route decisions are guided by specific algorithms designed to optimize navigation efficiency. In the event of an accident, the system incorporates an accelerometer to detect impact, triggering an immediate alert mechanism. This alert includes the dissemination of real-time location data to a designated contact person via both mobile messaging and email. Geo coding techniques are employed in conjunction with the Twilio application to ensure efficient communication. The deployment of self-driving cars not only promises enhanced safety through the elimination of human intervention but also offers the potential to reduce road accidents significantly. Additionally, these autonomous vehicles hold promise for addressing urban transportation challenges, such as traffic congestion, and find applications in military services.

Keywords: Self-Driving Cars, Vehicle Automation, Urban Transportation, Machine Learning, Obstacle Detection, Route Optimization, Human-Computer Interaction

Decoding Hand Gestures: A Machine Learning Framework for Sign Language Recognition

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Abstract: Sign Language is a critical method of correspondence for people with hearing impedances. Recognizing and interpreting hand gestures continuously is a fundamental challenge in empowering consistent correspondence between hard of hearing or nearly deaf people. [1] This paper presents a complete AI framework for communication through sign language recognition, focusing on the decoding of hand gestures. Our framework enhances various Machine Learning techniques and deep learning algorithms to automatically detect and interpret hand gestures in real-world scenarios. In this work will discuss the pipeline involved, starting with data collection and pre-processing, hand gesture detection, feature extraction, and, ultimately, sign language interpretation. [2] The framework incorporates Convolution Neural Networks (CNNs), Recurrent Neural Networks (RNNs), and attention mechanisms to handle the temporal and spatial aspects of sign language. In our further studies, we will explore the potential applications of this framework, including real-time translation of sign language into text or speech, enabling more comprehensive communication in various domains, such as education, healthcare, and accessibility services. After doing a comparative study the highlighted challenges and future directions in sign language recognition, such as enhancing accuracy for complex gestures and expanding the framework's support for additional sign languages. This paper presents a robust and versatile machine learning framework for decoding hand gestures in sign language, contributing to the advancement of inclusive communication technologies for the deaf and hard-of-hearing community. Our framework paves the way for more accessible and inclusive interactions between individuals using sign language and those who rely on spoken or written language.

Secure File Sharing in Cloud Using Elliptic Curve Cryptography

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Abstract: File sharing is the public or private sharing of files or folders on a computer connected to a network. Files can be easily shared outside a network via removable media, but the term file sharing almost always refers to sharing files on a network. File sharing allows several people to use the same file data. The file sharing module is a crucial component of any modern system that enables users to easily distribute and transfer files between different devices. It provides a seamless and convenient way to share various types of files. The module allows users to send files directly to others by utilizing popular cloud storage services. The file sharing module revolutionizes the way we handle and distribute files, making collaboration and information exchange more efficient and effortless. With this module, users can access their files from anywhere, ensuring flexibility and accessibility. It simplifies the process of sharing and accessing files, eliminating the need for physical transfers. However, it's essential to prioritize security and privacy when sharing sensitive information. As Cyber criminals have been exploiting the cloud using various vulnerable methods and one among them is weak encryption methods. In order to solve these problems, some kind of new approach is needed and therefore we proposed secure sharing of data in the cloud using Elliptic Curve Cryptography. In this paper we have shown the implementation of secure file sharing in cloud using Elliptic Curve Cryptography to achieve greater protection for cloud data transmission.

Computing Techniques in Health Care and Medical Sciences

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Abstract

This article seeks to concentrate on the concept of using computer science and artificial intelligence (AI) in health care and medical sciences. Whether the use of computer has revolutionized or going to revolutionize health care and medical sciences? How the relationship of man and machine (AI) is ascertained? Further, this paper intends to analyse the extent of probable use of AI in health care.

Critical Evaluation of Pre-processing Data in Machine Learning

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Abstract: Machine Learning is a field of Artificial Intelligence that allows system to learn from the past experiences without being explicitly programmed. Its uses are varied from prediction of agricultural products to disease detection. Data Preprocessing in machine learning is the process of preparing raw data that may contain noise or missing values by cleaning and organizing it, which make it suitable for building and training machine learning models. Data pre-processed before applying to the Machine Learning algorithm is a crucial step in the ML workflow. The data collected may not be sufficient, poor in quality, overfitting or underfitting and may have bias in dataset. Handling the missing values, removing the outliers and scaling the data can prevent the overfitting or underfitting and can lead to model that generalize better to new data. Preprocessing data improves the accuracy of the model by cleaning and formatting it with removing the inconsistent data and picking the relevant information only. It reduces the time and resources required to train the model, find the most compacted and informative set of features called feature extraction to enhance the efficiency of the classifier which also enhances the interpretability. A humble attempt is made in this paper to critically analyse the steps of preprocessing of data which may give the best result in training and testing a model in machine learning algorithm.

Keywords: noise, missing values, overfitting, underfitting, feature extraction

Potato Leaf Disease Detection using Deep Learning with Optimized Hyper-parameter and Adequate Pre-processing

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Abstract: Crop diseases have a big impact on global food security and agricultural productivity. It is essential to identify diseases quickly and accurately in order to minimize crop losses and maximize resource utilization. This study is focused on potato leaf disease detection. Here we use preprocessing techniques to improve image quality and minimize noise. Using the annotated dataset, a deep learning model based on CNN architecture is created and trained to identify specific features indicative of crop health and illnesses. To attain high accuracy and reduce false positives, the CNN model goes through extensive optimization and fine-tuning. In order to utilize pre-trained CNN models and expedite training while assuring the model can generalize well to various crops and disease kinds, transfer learning techniques are investigated. Extensive testing is carried out utilizing a broad dataset, including different crops and geographical regions, to assess the system's effectiveness. The system's efficacy in spotting agricultural illnesses is measured by looking at its accuracy, precision, recall, and F1-score. We have implemented potato leaf disease detection model proposed in [1], and use it as the reference model for our analysis. This model has achieved an accuracy of 93.2 % whereas our proposed model has remarkably shown an accuracy of 98.04 %. Our proposed model shows an improvement of 5.16%, which is quite significant. We have carried out our research on open-access image database, viz. Plant Village and Mendeley image resource. The dataset consists of images of three classes i.e. Healthy, Early Blight and Late Blight of potato leaf disease. The proposed model will be useful for farmers, agricultural professionals, and extension personnel to quickly and effectively diagnose crop diseases. Automation of disease identification aids in early intervention and prompt implementation of the proper control measures, which eventually results in improved crop yields, decreased financial losses, and increased food security. A user-friendly web application will be developed for crop disease detection. A probability score indicating the possibility of disease existence will also be integrated to the system as future scope of work.

Boro Language Library: Promoting Cultural Heritage

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Abstract: The ever-changing technology and the ever-ending catching up we do to keep ourselves updated all these years have changed and evolved many of us in different aspects. But as well we are leaving behind many that can't cope. One of those aspects especially is literature in many Scheduled Tribe communities like Boro residing in Assam, Northeast India. This paper aims to solve one of the ever-growing and challenging issues of the deteriorating mother tongue vocabulary due to the dawn of smart-phones. It proposes a personal dictionary that tries to provide a stopgap and to improve the vocabulary of individuals inside of that community. At this time, there is a lack of a better dictionary in the app market/play store written in Boro or one that even properly defines the word in terms of proper grammar in the said language. So, to promote the language in the native community, this dictionary will contain libraries that define Boro words, Boro to Boro translation along with proper definitions with the grammatical part. It will also have the feature to show search logs or history so, that there would be a quick option to look back at the meaning and check the logs of what an individual has learned/gained. It is a known fact that we tend not to keep track of the vocabulary of what we have learned, these words never come to the tip of the tongue even if one is familiarized with it. Moreover, as there are only a handful of applications for android trying to do the same, this should be one of a kind Boro-to-Boro mobile dictionary experience tailored for language preservation and revitalization.

A Study of Machine Learning Approach to Detect Depression and Diagnosis in bipolar disorder

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Abstract: Bipolar disorder, a multifaceted mental health condition, has a global impact on numerous individuals. Major depression disorder is responsible for the highest rate of disability and illness, impacting approximately 10% of the global population. Continuous monitoring is necessary for effective management. Machine Learning has been recognized as a highly effective method for analyzing the vast volume of data in the field of healthcare. Machine learning techniques are being used in the field of mental health to anticipate the likelihood of developing mental disorders. In this paper, we have named various machine learning algorithms employed for identifying and diagnosing depression. The various classes categorize the machine learning algorithms. A universal framework for identifying depression that encompasses data retrieval, preliminary processing, training machine learning algorithms, identifying issues, categorization, and assessing effectiveness. Furthermore, it provides a summary that allows for the identification of the goals and constraints of various research projects.

Graphical Partition of Some Specific Graphs with Applications in Social Network, Biological Networks and in VLSI design

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Abstract: In this paper, the specific graphs are drawn from the finite and the natural numbers. Here the graphs are connected, simple, and undirected. All the vertices of the graphs are assigned and designed by some specific integers such as triangular numbers or square numbers. First, we derived the functional construction of the triangular graph and square graph with the help of the triangular and the square numbers, then we discussed some theoretical investigation and there-after found the graphical partitions of triangular and the square graphs, finally focused some algorithms for finding the partitioning of the triangular and square graphs and then forwarded some real-life applications relating to our theoretical investigation.

An Efficient Smart and Secured Home Automation

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Abstract: The term IoT(Internet of Thing) refers to the collection of interconnected devices that communicates with the computing systems and connects as well as exchange data with the other communication systems allowing the physical world to be controlled and monitored. IoT is the foremost thing that captures our minds when it features Home Automation. The work engages with different intelligent Home Automation that makes a comfortable environment for the home. Smart Home technology is becoming ubiquitous with its wireless technology that made the life of human being easier and effortless. The work focuses on the concept of home automation that can be controlled and monitored using smart phones. Automation is the method of controlling the devices without much human interaction. The research accentuates on the mechanism where our daily essential gadgets can be dexterously and potently used in a more comforting way with added characteristics. This project aims at controlling home appliances from every corner of the world along with improved home security and also promotes a capable architecture of both short range and long range using multiple communication technologies like Wi-Fi and Bluetooth connectivity. The systems can be controlled and monitored by the user using web based interface platforms like IFTTT and cloud-based smart phone applications like Blynk. This paper proposes home automation as well as home security systems using Arduino Uno, nodeMCU, various sensors and other related devices that present a trend of simple technology that is economic yet flexible in monitoring and controlling systems. The proposed system is based on a multimodal application as it melds Google Assistant along with web based applications to refine user convenience.

Emotion Detection and Analysis on Online Communication Media

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Abstract: In the digital age, the nuances of human emotions are reflected in online communication, giving rise to a new field of emotion detection and analysis. This research paper explores the diverse landscape of emotions in digital interactions and reveals the methodologies, challenges, applications and ethical dimensions of this interesting field. Emotion detection methods use natural language processing (NLP) techniques, sentiment analysis, machine learning algorithms and advanced neural networks. Challenges and limitations arise from the complexity of language, the contextual nature of emotions, subjectivity, and the variety of language expressions that span cultures and languages. Applications reveal the transformative impact of emotion analytics across domains such as social media sentiment analysis, customer feedback, psychological research, and countering hate speech. The benefits of emotion detection extend to personalized marketing, mental health promotion, shaping user experiences and decision-making processes. Case studies illustrate practical applications of emotion detection in anti-cyber bullying, better customer interactions and Improvement of mental health, focusing on both successes and challenges. Future directions includes multimodal emotion analysis, emotion-aware artificial intelligence, and real-time emotion detection as technology evolves to create empathetic digital interactions. In summary, this research paper reveals the complex journey of emotion detection and analysis in online communication, illuminates the complex tapestry of emotions that shape our digital interactions, and offers a glimpse into a future where technology resonates with human emotion.

Smart Plant Monitoring Platform

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Abstract: The rapid modernization and burgeoning global population have engendered numerous consequential challenges, including limited land resources, water contamination, soil degradation, elevated temperatures, and water scarcity. These transformative shifts have also perturbed traditional agricultural practices and plant growth. Addressing these escalating global issues necessitates innovative solutions, particularly through precision farming and the utilization of IoT (Internet of Things) technology. The advent of a platform capable of providing timely insights into various field parameters such as soil moisture, humidity, and temperature can substantially mitigate these challenges. Achieving this goal hinges on the application of IoT in agriculture, with a specific emphasis on smart farming. We propose the integration of sustainable sensors, cloud-based analytics, weather prediction, IoT infrastructure, cloud computing, big data processing, and predictive analysis. This comprehensive approach enables real-time monitoring, data collection, and analysis through sensor and IoT connectivity. Additionally, cloud computing and advanced analytics efficiently process vast datasets, while accurate weather predictions facilitate informed decision-making. Furthermore, a mobile application will offer remote access to field status and enable irrigation control based on real-time data. These technological advancements collectively present a holistic solution for enhancing resource management efficiency, optimizing irrigation practices, and ultimately improving agricultural outcomes. In an era marked by modernity and hectic lifestyles, this mobile application provides a valuable tool for individuals seeking to monitor and nurture their plants or gardens, even in their absence or from a remote location.

Keywords: Smart Plant Monitoring, Precision Farming, IoT Technology, Agricultural Sensors, Cloud-Based Analytics, Remote Field Management, Real-time Data Monitoring

A REVIEW ON DEEP LEARNING TECHNIQUES FOR TOMATO LEAF DISEASE RECOGNITION

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Abstract: The tomato is one of the most significant and extensively utilized crops in the world. The type of fertilization used affects the tomato's volume. Leaf disease is the primary factor influencing crop output in terms of both quantity and quality. Consequently, it is essential to accurately classify and diagnose these ailments. Treating these infections as soon as possible would minimize their influence on tomato plants and guarantee maximum yield. The different tactics employed in tomato leaf illness identity are carefully examined with the use of deep learning techniques. In the field of computer vision, deep learning has also become increasingly important for delivering better performance results for tomato leaf disease identification. With the use of collected data, the deep learning approach may be able to detect leaf illnesses and prevent severe production losses. This paper presents the superiority of deep learning models for Tomato leaf disease recognition and comparative analysis between the deep learning methods to check out the performance of the deep learning models for identifying the tomato leaf disease.

Smart Grid using IoT and Edge Computing

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Abstract: A smart grid is an electrical grid system that includes a variety of operations and energy measures such as advanced metering infrastructure (smart meter), load control switches and smart appliances, renewable energy resources (rechargeable batteries) etc. Power consumption and continuous power supply is a major challenge in modern IoT devices. In smart grid using IoT edge computing, IoT devices are deployed throughout the grid infrastructure. These devices collect real-time data on energy consumption, grid performance, and environmental factors. Instead of sending all this data to a centralized server, edge computing comes into play. The data is processed and analyzed locally, at the edge of the network, reducing latency and enhancing efficiency. This allows for real-time decision-making and control, such as optimizing energy distribution, detecting faults, and predicting maintenance needs. The processed data can also be used for advanced analytic, enabling grid operators to make informed decisions for better energy management. It's a combination of smart devices, local processing, and intelligent algorithms working together to create a more efficient and responsive energy grid. This is paper is aimed to discuss about various techniques used in IoT devices and their pros and cons in energy saving operations.

Enhancing Agricultural Water Resource Management with IoT-Based Soil Moisture Monitoring and Irrigation

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Abstract: Inefficient water resource management within the agricultural sector remains a persistent challenge, resulting in suboptimal irrigation practices, diminished crop yields, resource wastage, and heightened manual labor demands. Conventional approaches to soil moisture monitoring and irrigation suffer from limitations such as inadequate real-time data accessibility and remote control capabilities. This journal paper introduces an innovative solution that harnesses the potential of Internet of Things (IoT) technology, specifically utilizing the Blynk IoT platform, to ameliorate these pressing concerns. The Soil Moisture Monitoring and Irrigation System with Blynk IoT is engineered with the primary objective of empowering farmers and horticulturists to remotely oversee soil moisture levels, receive prompt notifications, and automate irrigation processes grounded in precise and reliable data. The system boost key features including high-precision soil moisture sensors, seamless integration with the Blynk IoT platform, automated irrigation activation contingent upon predefined moisture thresholds, and a robust network security mechanism to forestall unauthorized access. This system confers an array of advantages to its users. It facilitates water conservation by circumventing unnecessary irrigation, augments crop yield through the meticulous management of soil moisture, yields time and labor efficiencies through automated procedures, and affords the convenience of remote monitoring and control via the intuitive Blynk app interface. Moreover, its scalability and expandability render it adaptable to a spectrum of agricultural settings and operational scales. In summation, the Soil Moisture Monitoring and Irrigation System with Blynk IoT signifies a sophisticated and effective solution for soil moisture management in agriculture. Its alignment with the burgeoning demand for sustainable and technology-driven farming practices makes it a valuable asset in enhancing resource management, conserving water, and elevating crop productivity while embracing environmentally conscious agricultural paradigms.

Keywords: Soil Moisture Monitoring, Irrigation Management, Water Resource Management, IoT, Blynk Platform, Sensor Technology, Sustainable Farming

Assessment of Radiation Concentration in Rocks and Soil: Implications for Environmental Health and Safety

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Abstract: This article aims to investigate the theoretical and computational aspects of assessing radiation concentration in rocks and soil. The primary focus is on natural radioactivity stemming from radionuclides like ^{238}U, ^{232}Th, and ^{40}K. Radionuclides are commonly found in rocks, widely utilized in construction activities, and also prevalent in natural soil, constituting a significant source of gamma radiation exposure. Our research investigates the distribution of ^{238}U, ^{232}Th, and ^{40}K within rocks across diverse regions of India, revealing regional disparities in their concentrations. This study sheds light on the potential environmental hazards and health risks associated with these radionuclides. Notably, K-40 emits beta electrons, readily absorbed by the human body. In contrast, the ingestion of ^{238}U can lead to accumulations around vital organs such as the kidneys and bones, while ^{232}Th can find its way into the food chain, raising health concerns, including the risk of cancer. To assess the uptake of radioactive isotopes from the environment, we calculate discrimination factors (DF). Furthermore, we measured the transfer factors (TF), with a particular focus on the transfer of Sr-90 in interactions between plants and soil as well as between animals and plants. The near-perfect transfer ratios, approaching 100%, raise significant environmental concerns.

Keywords: Radionuclide, Soil, Rock, Transfer Factor, Discrimination Factor, Safety

Modulation Instability in Graphene Quantum Dot under Electromagnetically Induced Transparency

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Abstract: We analyze theoretically the modulation instability of a weak probe pulse under the regime of an electromagnetically induced transparency (EIT) in a one-dimensional photonic crystal with grapheme quantum dots nanostructure. A three-level ladder type configuration driven by the weak probe field and two strong control fields is applied to achieve the EIT condition. At the probe wavelength 1.55 μm, the existence of third-order (or Kerr) susceptibility is found to be as large as $10^{-11} m^2/V^2$ identified in quantum dot nanostructure under the EIT scheme. Such giant Kerr nonlinearity interplays with the dispersion in the system to produce modulation instability with high sensitivity at much low power. The instability can be modulated under EIT window by manipulating the two control fields, which may offer a wide range of applicability of such systems for fabrication of different nonlinear optical devices.

Keywords: Quantum Dots, Electromagnetically Induced Transparency, Kerr susceptibilities, Modulation Instability,

Morphological Investigation of Biosilica Diatoms Collected from Assam and Meghalaya

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Abstract: In this paper, we have investigated the naturally obtained biosilica diatoms collected from North-Eastern India. Diatoms are a major group of ubiquitous monocellular microalgae that live in moist and shady places where the amount of sunlight is very low. The motivation for the project came from the structural equivalence of diatoms and photonic crystal fibers. We started our project with collection of the diatom samples from different water bodies nearby USTM. For preliminary observation of presence of diatoms, we went for light microscopy. To separate out the diatoms from other microorganisms, dirt and clean the pores present in the diatoms we performed acid digestion method. The extracted diatom samples are then sent for SEM and EDX. The SEM image reveals the presence of pinnate diatoms in the samples and EDX further confirms the availability of Silicon and Oxygen, which indicates that the diatoms are morphologically as well as optically equivalent to the photonic crystal fibers (PCFs). Being naturally obtained and morphologically equivalent to PCFs, the diatom possesses immense possibility of replacing the costly PCFs from optical devices.

Keywords: Diatom, Acid Digestion, SEM, EDX, Photonic Crystal Fibers

Internet Addiction and its Psychological Effect on College Students

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Abstract: The internet has become an integral part of human life with an importance that cannot be overemphasized. It gives access to timely, accurate, and relevant information. The use of the internet has increased drastically in recent years. The number of active internet users has increased globally. As of January 2023, there were 5.16 billion internet users worldwide, which is 64.4 percent of the global population Internet has drastically affected human behavior, and it has positive and negative effects; however, its excessive usage exposes users to internet addiction. In recent times a growing number of cases have shown a psychological dependency associated with gambling, sex, the internet and this can result in feelings of guilt, shame, hopelessness, despair, failure, rejection, anxiety, and humiliation. The present study was intended to investigate the psychological effect of internet addiction on college going students

Keywords: Internet addiction, Psychological effects

Image Classification System Using CNN and Keras System

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Abstract: The Technology and Optimization is a top platform for sharing cutting-edge research in energy optimization and engineering .With Image recognition, a vital part of computer vision, identifies objects and features in digital images using algorithms like Optical Character Recognition, Pattern Matching, Facial Recognition, License Plate Identification, and Scene Change Detection. Simultaneously, Image Classification endeavors to bridge the gap between computer and human vision, allowing machines to categorize images. Our proposed "Image Classification using Deep Learning concept CNN and Keras" system harnesses Neural Networks and measures classification accuracy on both GPU and CPU platforms.

Keywords: Image recognition, machine learning model, image classification, face detection.