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DEPARTMENT OF ARTIFICIAL INTELLIGENCE AND DATA SCIENCE

TECHNICAL MAGAZINE

ACADEMIC YEAR 2024-2025 - ODD SEMESTER

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Message from the Head of Department

The Department of Artificial Intelligence and Data Science, established in 2022 at Akshaya College of Engineering and Technology, offers a four-year B.Tech. Degree program with an intake of 60 students. The department is striving towards the goal of providing innovative and quality education to the students to achieve academic excellence. The department is committed to equip students with the necessary knowledge and skills to excel in the rapidly evolving fields of Artificial Intelligence and Data Science, empowering them to become future leaders and innovators in the industry. The motto of the department is to provide quality technical education to make the students industry-ready. Our goal is to ensure that our engineering graduates are well prepared to play the roles of problem solvers, project leaders, entrepreneurs, and above all ethical citizens of a global society.

Dr. R. Mekala,
Professor & Head,
Department of Artificial Intelligence and Data Science

Vision and Mission of the department

Vision of the Department

To foster industry cooperation and impart cognitive learning in order to develop professionals who can adapt to the shifting demands of new trends in Artificial Intelligence and Data Science

Mission of the Department

DM 1 : To provide an Excellent infrastructure that keeps up with modern trends and technologies for students and educators.

DM 2 : To impart knowledge in cutting edge technology for Artificial Intelligence and Data Science with industrial standards.

DM 3 : To impart high-quality education embedded with moral and ethical principles.

DM 4 : To encourage lifelong learning and research that benefit society as a whole.

Program Educational Objectives (PEOs)

PEO 1 : Apply the knowledge of basic sciences, mathematics, Artificial Intelligence, data science and statistics to build a system that requires in analysis of huge volumes of data.

PEO 2 : Product Development: Design a model using Artificial Intelligence to solve the critical problems in real world.

PEO 3 : Higher Studies: To enable the students to think logically and pursue life-long learning and collaborate with an ethical attitude in a multidisciplinary team.

Program Specific Outcomes (PSOs)

PSO 1 : Create, select and apply the knowledge of AI and Data Science to solve societal problems.

PSO 2: Develop data analytics and data visualization skills, skills pertaining to knowledge acquisition, knowledge representation and knowledge engineering, and hence be capable of coordinating complex projects.

Program Outcomes (POs)

PO 1 : Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO 2 : Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO 3 : Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations

PO 4 : Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO 5 : Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO 6 : The Engineer and Society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO 7 : Environment and Sustainability: Understand the impact of the professional engineeringsolutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO 8 : Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO 9 : Individual and Team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO 10 : Communication: Communicate effectively on complex engineering activities with theengineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO 11 : Project management and Finance: Demonstrate knowledge and understanding of theengineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO 12 : Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Message From Editorial Team

Chief Editor:

Dr.R.Mekala, Professor & HoD-AI&DS

The department of Artificial Intelligence and Data Science is striving towards the goal ofproviding innovative and quality education to the students to achieve academic excellence.

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Our goal is to ensure that our engineering graduates are well prepared to play the roles ofproblem solvers, project leaders, entrepreneurs, and above all ethical citizens of a globalsociety.

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IOT (Internet of Things) In MEDICAL CARE

The Indian healthcare sector has experienced growth lately, although the nation trails behind in various health metrics. India, which is presently the second most populated country in the world, contributes to 20% of the global disease burden and experiences an infant mortality rate of 40 deaths per 1,000 live births, alongside a maternal mortality rate of 174 deaths for every 100,000 live births. Barriers to the expansion of the healthcare system consist of an aging and growing population, insufficient infrastructure and a deficit of healthcare workers, limited access to quality medical services in rural and remote locations, a rise in chronic diseases, and escalating healthcare costs. The Internet of Things (IoT) facilitated connectivity can elevate this struggling healthcare system into an integrated, efficient, and patient-focused framework. This will assist in shifting the present emphasis from curative care to health and wellness, thus lowering healthcare costs through comprehensive strategies. Through the incorporation of medical "things" - devices, intelligent sensors, Health applications, artificial intelligence (AI), and so on - through the Internet, the opportunities are limitless. For instance, IoT is utilized to monitor disease progression and treatments, assess patients' health status and adjust their medication as needed, analyze medication usage data for adherence to treatment strategies, and offer immediate updates on symptoms. Information to forecast and prevent health issues, allowing healthcare professionals to easily create tailored and proactive healthcare strategies, efficiently utilize medical techniques and medications, and offer the best care during sickness. The

healthcare sector in India is favorable for the adoption of IoT, with elements that back and enable IoT integration in healthcare. This encompasses a group of doctors, scientists, mathematicians, engineers, and usability designers coming together to enhance health outcomes for individuals. The adoption of electronic health records (EHRs) is also increasing in popularity. Smartwatches, fitness bands, monitoring patches, and heart rhythm monitors are examples of IoT-enabled gadgets that are currently available to collect and track healthcare information. Despite these positive developments, there are specific challenges associated with implementing IoT in healthcare. This encompasses the storage, management, and protection of vast quantities of health data. Concerns about patient privacy, particularly data privacy, arise from the integration of different devices that track, share, and send data for analysis. Moreover, there are legal and regulatory obstacles, as there is insufficient transparency and guidelines for data security concerning the accessibility or utilization of data. The challenge of incompatibility and non-interoperability among diverse medical and health monitoring devices arises from differences in their hardware, software, and firmware, lack of unified cloud services, various operating systems, outdated technologies, and more, which must be tackled. IoT is set to lead in a new age of comprehensive healthcare solutions, emphasizing preventive and therapeutic treatments. Health and wellness management systems concentrate on the collection, distribution, and examination of real-time health information to foresee and prevent health issues. This empowers healthcare professionals to effectively create personalized and preemptive healthcare strategies, efficiently utilize medical practices and medications, and offer the best treatment during health crises. These solutions feature customized alerts and reminders, tailored tips and suggestions according to health condition, guidance on nutritious eating options, emergency assistance, and more. IoT is making healthcare technology more accessible for individuals, featuring interfaces that help users grasp how an application can assist them in their daily routines. For example, an app that tracks blood pressure, body weight, body temperature, blood sugar, and more would be highly user-friendly, despite these measurements typically being taken with various smart devices that each serve different purposes.

The healthcare sector in India is favorable for the adoption of IoT, with elements that aid and promote IoT integration in healthcare. This

encompasses a group of doctors, scientists, mathematicians, engineers, and usability designers coming together to enhance health results for the population. The adoption of electronic health records (EHRs) is also increasing in popularity. Smartwatches, fitness trackers, monitoring stickers, and heart rhythm monitors are instances of IoT-powered devices that currently exist to collect and track healthcare information.

Despite these positive developments, there are some challenges associated with implementing IoT in healthcare. This encompasses the storage, management, and protection of vast quantities of health data. Concerns regarding patient privacy, particularly data privacy, arise from the integration of multiple devices that observe, share, and send data for processing. Moreover, there are legal and regulatory obstacles due to insufficient transparency and data security protocols regarding data accessibility and usage. The lack of compatibility and interoperability among diverse medical and health monitoring devices regarding their hardware, software, and firmware, alongside fragmented cloud services, varying operating systems, outdated technologies, etc., represents another challenge that must be tackled. IoT is set to bring forth a new age of comprehensive healthcare solutions, emphasizing preventive and therapeutic care.

IoT is making healthcare technology more accessible for individuals, featuring interfaces that simplify how users comprehend the benefits an application offers them in their daily routines.

For example, an all-in-one app that tracks blood pressure, body weight, body temperature, blood sugar, and more would be quite user-friendly, even if these metrics have historically been monitored with various smart devices featuring different functions.

By,

Senthil Raja.V,

Serjin Hubert.J.H.

INTELLIGENT HOMES – DOMESTICATION OF IOT

The IoT has transformed how we perform everyday tasks, making our lives more convenient as we can manage devices nearby with just a touch on our smartphones. Before IoT, individuals would have to get up physically to perform tasks around the home, like turning on the water heater or switching on the lights. IoT also encompasses mobile devices; as they can interact with others and handle data, they are omnipresent devices. Everyone has a smartphone with them throughout the day. You can manage items with a mobile device. Nowadays, you can find advanced smart refrigerators equipped with built-in cameras, allowing you to view their contents while shopping. In the future, refrigerators will be able to sense when you're running low on supplies and will send a necessary grocery list to your smartphone. Shops could then offer recommendations to include food and other items, taking into account past purchases and typical buying behaviors. While walking through the supermarket, notifications will be sent to your phone to guarantee you won't need to return to the store a second time. Utilizing IoT can significantly reduce expenses for companies functioning in the economy. Organizations utilize IoT for creative management and for monitoring distributed data. Consequently, they can manage the latter from remote locations while supplying data to applications and information storage.

IoT allows the advantage of anticipating events in advance. Due to the low cost of IoT, it is now feasible to monitor and control activities that were

previously unreachable. The financial facet is the greatest advantage as this innovation might take over the tasks of those in charge of monitoring and adhering to regulations. As a result, costs can be reduced and streamlined. Smart homes exemplify the adaptation of IoT (Internet of Things) technology, merging interconnected devices to improve convenience, security, and efficiency. These systems enable remote management of appliances, lighting, and HVAC via mobile applications or voice assistants. Smart homes with IoT capabilities enhance energy efficiency through automation and real-time tracking. Security solutions such as smart locks and cameras offer homeowners reassurance. Gadgets such as smart fridges and sensors enhance everyday life by providing predictive upkeep and notifications. The swift expansion of IoT is transforming contemporary residences into linked, smart environments.

By,

Yeddula Ganesh,

Santhosh.M.

BLOCKCHAIN

By 2030, blockchain is expected to create $3.1 trillion (approximately $9,500 per individual in the US), and since the technology is on track for broader adoption by 2023, companies ought to begin exploring it now. This is particularly true as large multinational firms and digital behemoths aim to seize bigger market shares by integrating blockchain elements such as distributed ledger technology to strengthen a centralized business model. Blockchain enables individuals who might not be acquainted to conduct transactions securely and directly—ideally without requiring a lawyer, bank, broker, or government to facilitate the agreement. The blockchain verifies participants' identities, authenticates transactions, and guarantees that all adhere to its regulations. The extensive variety of assets available for trading and the range of participants involved - including machines - generates significant commercial opportunities. For instance, when the technology reaches full maturity and works alongside complementary technologies like AI and IDT, autonomous agents representing a driver could directly negotiate insurance rates with various car insurance providers using information gathered from sensors. Governments have been investigating possible applications, and while many are still in their early stages, a few intriguing use cases have surfaced.

For instance, a county in Utah, United States, has investigated the use of blockchain for its local elections. Blockchain solutions are also fostering

greater accountability and enhancing the capacity to assess the actual impact of policies. In the financial services sector, blockchain creates possibilities for international payments, trade finance, improved securities settlement, and more secure identity verification systems. However, the true change will take place through the establishment of new digital assets and the decentralization of finance. Like all technologies, blockchain faces its own set of challenges. For instance, existing regulations might require alterations or new implementation to support blockchain applications, and financial reporting along with compliance remains ambiguous. The technology also suffers from a lack of legal, tax, and accounting frameworks, insufficient interoperability, scalability issues, and there are limited or ineffective governance models and standards in existence. Numerous iterations of blockchain are being developed within current operating frameworks, where the initial goal was to challenge and remove centralized organizations, functions, procedures, and business models through open-source and democratized participation. The launch and timing of bitcoin appeared deliberately aimed at disrupting the banking and financial sectors. Nevertheless, given customer attitudes, viable solutions, and restricting technology, achieving success as originally planned appears improbable. In various sectors where blockchain might cause significant changes, companies that are cautious about risks are tightly managing the risk elements, leading to gradual enhancements rather than revolutionary disruptions. A deficiency in executive comprehension is another significant barrier. Businesses aiming to employ blockchain technology can eliminate the need for a central authority entirely. Realizing significant change in this sector will require time because of the typical adoption and technical challenges previously discussed - yet the possibilities for blockchain-complete and improved-blockchain solutions are already driving blockchain enthusiasts to develop new and influential business models.

By,

Vijay.S,

Dhanush.A.

CYBER WARFARE

Cyber warfare is commonly defined as a cyber-attack aimed at a nation. It has the capability to wreak havoc on governmental and civil infrastructure and disturb essential systems, leading to harm to the nation. It is a conflict that occurs online and involves the intruding of computer systems and networks belonging to other countries. These aggressors possess the resources and skills to initiate large-scale Internet-oriented assaults on other countries to inflict harm or interrupt services, like disabling a power grid. This enables countries with a limited military presence to be equally powerful as other nations in cyberspace. The primary goal of cyberwarfare is to achieve a superiority over adversaries, be they countries or rivals. A country can perpetually attack the infrastructure of other nations, appropriate defense secrets, and collect data on technology to close the gaps in its industries and military. In addition to industrial and military monitoring, cyber warfare can damage the infrastructure of other countries and result in loss of life in those nations. For instance, an assault may interrupt the electricity network of a large metropolis. Traffic disruptions would occur. The trade of products and services can be halted. Patients are unable to receive the required care in emergency circumstances. Internet

access might also be interrupted. By impacting the power grid, the assault can influence the daily lives of average citizens.

In addition, sensitive data that has been compromised can enable attackers to extort government personnel. The data could enable an attacker to impersonate an authorized user and gain access to confidential information. Should the government fail to safeguard against cyber-attacks, citizens might doubt its capability to ensure their protection. Cyber warfare has the potential to undermine a nation and impact the citizens' trust in their government. A significant cyber-attack example is the Stuxnet malware, which was created to harm Iran's nuclear facility. Stuxnet malware did not take control of targeted computers to gather information. It was created to harm physical devices that were managed by computers. It employed illicitly obtained digital certificates, making the attack look authentic to the system. As demonstrated earlier, cyber warfare has the potential to harm important assets and disrupt the entire economy of a nation. It is advisable to implement essential steps to guarantee the safety of our data. Here are several methods we can employ to achieve this: Develop a policy that explicitly defines company regulations, job responsibilities, and anticipated outcomes. Limit entry to networking closets, server areas, and fire suppression systems. Employees must undergo comprehensive background checks. Carry out routine backups and verify data restoration from these backups. Utilize advanced routers, firewalls, and various security devices. Utilize high-level antimalware and antivirus programs. Instruct users and staff on safe practices. Secure all confidential company information, including emails. Cyber-attacks will persist. They are inexpensive and can be surprisingly efficient. In today's rapidly evolving digital landscape, cyber threats are undeniable; thus, it is especially crucial to understand how to protect against them and promote awareness about Cyber Security.

By,

Varun.M.S,

Mohamed Faizal.

CLOUD COMPUTING

Cloud computing refers to a broad concept that encompasses providing hosted services through the internet. These services fall into three primary categories or forms of cloud computing: infrastructure as a service (IaaS), platform as a service (PaaS), and software as a service (SaaS). A cloud may be either private or public. A public cloud offers services to all users on the internet. A private cloud is a specialized network or data center that provides hosted services to a restricted group of users, along with specific access and permission configurations. Whether private or public, cloud computing aims to deliver convenient, scalable access to IT services and computing resources. Cloud infrastructure encompasses the hardware and software elements necessary for the effective functioning of a cloud computing framework. Cloud computing can alternatively be regarded as utility computing or computing on demand. An internet network connection connects the front end, comprising the accessing client device, browser, network, and cloud software applications, with the back end, which includes databases, servers, and computers. The back end acts as a storage unit, holding data that the front end retrieves. A central server oversees the interactions between the front and back ends. The main server depends on protocols to enable the transfer of data. The main server depends on protocols to enable data exchange. The main server utilizes software and

middleware to handle the connection between various client devices and cloud servers. Generally, a specific server is allocated for each separate application or task. Cloud computing is largely dependent on virtualization and automation technologies. Virtualization allows for the straightforward abstraction and delivery of services and foundational cloud systems as logical units that users can demand and make use of. Automation and related orchestration features give users significant self-service ability to allocate resources, link services, and deploy workloads without needing direct assistance from the cloud provider's IT personnel. Private cloud solutions are provided from a company's data center to internal users. In a private cloud, an organization creates and sustains its own foundational cloud infrastructure. This model provides both the flexibility and ease of the cloud, while maintaining the management, control, and security typically found in local data centers. Internal users may or may not incur charges for services via IT chargeback. Popular private cloud technologies and providers consist of VMware and OpenStack. Customers are only charged for the central processing unit cycles, storage, or bandwidth they utilize. Prominent public CSPs (Cloud Service Providers) consist of AWS (Amazon Web Services), Microsoft Azure, IBM, and Google Cloud Platform (GCP), alongside Oracle, IBM, and Tencent. A hybrid cloud merges public cloud services with an on-site private cloud, facilitating orchestration and automation between them. Businesses can execute mission-critical tasks or sensitive programs on the private cloud while leveraging the public cloud to manage workload surges or increases in demand. However, there are additional obstacles that cloud computing needs to address. Individuals are quite doubtful regarding the security and privacy of their data. Globally, there are no established standards or regulations governing data provided by cloud computing. Europe has data protection legislation, whereas the US, as one of the leading technologically advanced countries, lacks any such laws. Users are also concerned about who has the ability to share their data and who owns it. However, once global standards and regulations are established, cloud computing will transform the future.

By,

Sai Charan Kumar Reddy,

Ashwanth.F.L.

PHISHING

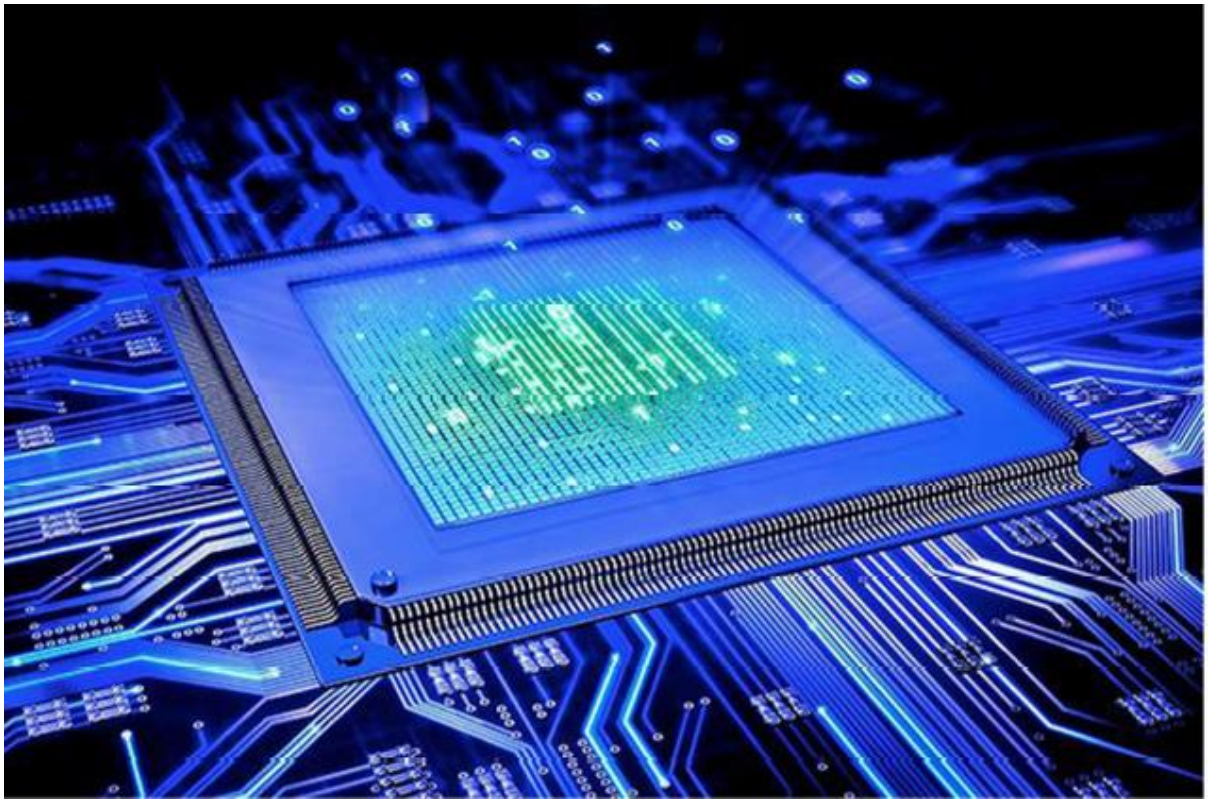
Now picture receiving a message from the Prime Minister's office of India, informing you that you have the chance to work alongside Mr. Narendra Modi; how would you respond? I would be extremely happy until I receive another message in the mail stating that I will need to pay a specific amount to seize the chance. And now, this is going to be extremely disappointing for me. This cybersecurity incident is commonly referred to as phishing in casual terms. Phishing is a cyber-crime where an individual is approached via email, phone, or text by someone impersonating a legitimate organization to entice people into offering confidential information like personal identification details, banking information, credit card numbers, and passwords. There are numerous methods to earn quick cash, and hackers opt for this route of phishing. They profit from the tiny fraction of recipients who reply to the message. Certain individuals transfer harmful code onto the computer utilized by the operator. Let's be honest: the future is here. We currently inhabit a cyber society, so we must stop overlooking it or acting as if it doesn't influence us. In 2021, RiskIQ estimated that companies globally lose $1,797,945 every minute because of cybercrime, with an average breach costing a business $7.2 each minute. Ninety-six percent of phishing attempts come through email. An additional 3% occur through harmful websites and merely 1% through phone calls. The rise in phishing attacks indicates that email communication systems are infested with

cybercrime. According to Symantec research, in 2020, 1 out of every 4,200 emails was identified as a phishing email. When discussing these losses, it isn't solely a monetary issue; businesses suffer their hard-earned reputations, and some individuals unfortunately lose their entire savings simply by clicking on the link. In cyber security, there are three key Ps: Perception, Protection, and Precision. Awareness or understanding of various forms of phishing such as Instant Messaging, Spamming, and Web-based Delivery is essential. It is necessary to not engage with insincere links. Protection is achieved by securing websites with a legitimate Secure Socket Layer (SSL) certificate starting with 'HTTPS.' Another method of safeguarding involves utilizing reputable security software such as McAfee and Avast. Regarding precision, whenever you get such emails, ensure you pay attention to the attachments and hyperlinks to verify their authenticity. If an offer seems too good to be real, trust your gut and refrain from responding to the email. Trust in technology is beneficial, but having control is even better. Understanding your cyber environment today is as essential as grasping a foreign language.

By,

Guru Vishnu,

Varshini.P.



AI MODELS IN MICROPROCESSOR PERFORMANCE

In contemporary computer processors, computations are executed at a rate of about 3 trillion cycles per second. Monitoring the power used by these extremely rapid transitions is crucial for preserving the chip's performance and efficiency. If a processor consumes excessive power, it may overheat and lead to damage. Abrupt changes in power demand can lead to internal electromagnetic issues that may throttle the entire processor's speed. Computer engineers can safeguard their hardware and enhance its performance by using software that predicts and prevents these unwanted extremes from occurring. However, these plans incur expenses. Staying up to date with contemporary microprocessors often demands valuable additional hardware and processing capability. AP0LL0 nears an optimal power estimation algorithm that is both precise and swift, and can be seamlessly integrated into a processing core with minimal power expenditure, stated Xie. Due to its applicability in various processing units, it has the potential to become a standard element in upcoming chip designs.The power of AP0LL01s is derived from artificial intelligence. The algorithm that was created by Xie and Chen utilizes AI to pinpoint and

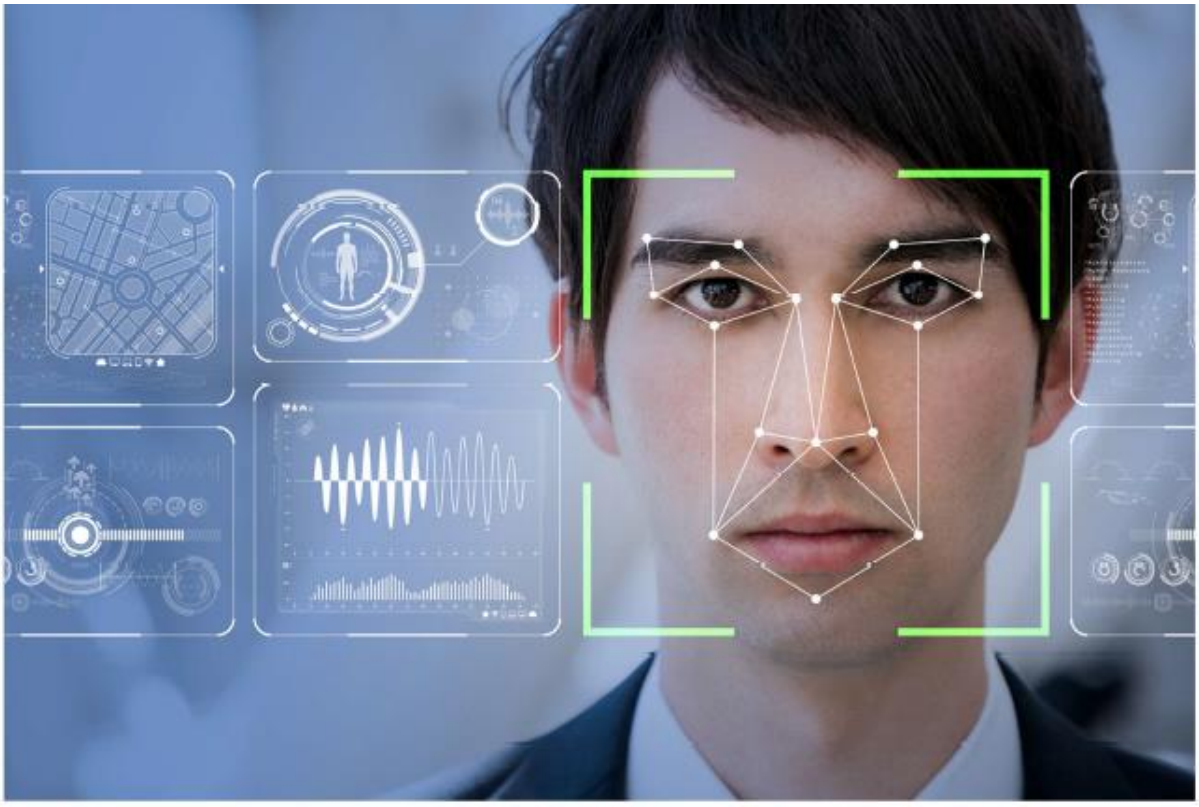
choose only 100 signals from a processor's millions that relate most closely to its power usage.

Modern computer processors perform calculations at a speed of approximately 3 trillion cycles every second. Tracking the energy consumed during these very swift transitions is essential for maintaining the chip's performance and efficiency. If a processor uses too much power, it could overheat and cause damage. Sudden fluctuations in power demand can result in internal electromagnetic problems that might slow down the entire processor's performance. Computer engineers can protect their hardware and improve its performance by employing software that forecasts and prevents these undesirable extremes from happening. Nonetheless, these strategies involve costs. Keeping abreast of modern microprocessors frequently requires significant extra hardware and processing power. AP0LL0 approaches a highly accurate and rapid power estimation algorithm that can easily be integrated into a processing core while consuming little power, Xie remarked. Because of its utility in different processing units, it could become a standard component in future chip designs. The strength of AP0LL01s comes from artificial intelligence. The algorithm that was developed by Xie and Chen employs AI to identify and select just 100 signals from a processor's millions that are most relevant to its power consumption.

By,

Sethupathi.T,

Sirivela Madhava.



AI LIGHT-FIELD CAMERA READS 3D FACIAL EXPRESSIONS

In contrast to a traditional camera, the light-field camera features micro-lens arrays positioned before the image sensor, enabling the camera to be compact enough for a smartphone, while capturing both the spatial and directional details of light in a single capture. The method has garnered interest because it can recreate images in various forms such as multi-view, refocusing, and 30 image capture, leading to numerous possible uses. The collaborative research team utilized a vertical-cavity surface-emitting laser (VCSEL) in the near-infrared range to enhance the precision of 30 image reconstructions that were previously reliant on ambient light. When an external light source illuminates a face at angles of 0, 30, and 60 degrees, the light field camera decreases image reconstruction errors by 54%. Moreover, by placing a light-absorbing layer for visible and near-infrared wavelengths between the micro-lens arrays, the team was able to reduce optical crosstalk and enhance image contrast by 2.1 times. The team managed to surpass the constraints of current light-field cameras and successfully created their NIR-based light-field camera (NIR-LFC), specifically optimized for the reconstruction of 30 facial expression images.

Utilizing the NIR-LFC, the group obtained high-quality 30 reconstruction images of facial expressions conveying different emotions, irrespective of the ambient lighting conditions. The facial expressions in the collected 30 images were identified using machine learning with an average accuracy of 85% -- a statistically significant number in comparison to when 20 images were utilized. Additionally, by assessing the interrelationship of distance data that fluctuates with facial expressions in 30 images, the team was able to pinpoint the information leveraged by a light-field camera to differentiate human expressions. It could emerge as the new platform for quantitatively assessing human facial expressions and emotions. It may be utilized in multiple areas such as mobile health, onsite diagnosis, social understanding, and human-computer interactions.

By,

Pula Anunn,

Rubanraj.

FAITH IN AI

Numerous individuals believe that the swift advancement of technology frequently surpasses the growth of the social frameworks that implicitly direct and oversee it, like law or ethics. AI illustrates this point as it has rapidly become ubiquitous in the daily lives of countless individuals. This rapid growth, alongside the relative intricacy of AI compared to more familiar technologies, can foster fear and distrust of this essential aspect of contemporary life. Identifying who has doubts about AI and how those doubts manifest is information that would be beneficial for developers and regulators of AI technology, yet such inquiries are challenging to measure. A team of researchers from the University of Tokyo, headed by Professor Hiromi Yokoyama of the Kavli Institute for the Physics and Mathematics of the Universe, aimed to measure public opinions on ethical concerns related to AI. The team aimed to address two specific questions through survey analysis: how attitudes vary based on the scenario shown to a respondent and how the respondent's own demographics influenced their attitudes. Ethics cannot truly be measured, so to assess views on the ethics of AI, the team utilized eight themes prevalent in numerous AI applications that pose ethical challenges: privacy, accountability, safety and security, transparency and explain-ability, fairness and non-discrimination, human control over technology, professional responsibility, and the advancement of human values. The group referred to these as "octagon measurements," drawing inspiration from a 2020 study conducted by Jessica Fjeld and her team at Harvard University. Survey participants were presented with a set of four

scenarios to evaluate based on these eight criteria. Every scenario examined a distinct use of AI. They included: AI-generated art, customer service AI, autonomous weaponry, and crime forecasting. The participants in the survey also provided the researchers with details about themselves, including age, gender, job, and education level, along with an assessment of their interest in science and technology through a separate series of questions. This data was crucial for the researchers to identify which traits of individuals would align with specific attitudes. Previous research has indicated that risk is viewed more unfavourably by women, older individuals, and those with greater subject expertise. I anticipated observing something unique in this survey, considering how prevalent Al has become, but unexpectedly, we observed comparable trends here, stated Yokoyama. One observation that aligned with expectations was the varying perceptions of the different scenarios, particularly the notion of AI weapons, which was greeted with significantly more scepticism compared to the other three scenarios. The team anticipates that the findings may pave the way for developing a universal metric to assess and contrast ethical concerns related to AI. This survey focused on Japan, yet the team has already started collecting data in various other nations. According to Assistant Professor Tilman Hartwig, a global standard would enable researchers, developers, and regulators to more effectively assess the acceptance of particular AI applications or their effects and respond appropriately. One thing I found while creating the scenarios and questionnaire is that numerous subjects related to AI need substantial clarification, even more than we had anticipated. This illustrates that there is a significant disparity between perception and reality regarding AI.

By,

Pavithra.R,

Mahendra Reddy.

AUTONOMOUS VEHICLES: FUTURE AHEAD

The participants in the survey also provided the researchers with details about themselves, including age, gender, job, and education level, along with an assessment of their interest in science and technology through a separate series of questions. This data was crucial for the researchers to identify which traits of individuals would align with specific attitudes. Previous research has indicated that risk is viewed more unfavourably by women, older individuals, and those with greater subject expertise. I anticipated observing something unique in this survey, considering how prevalent Al has become, but unexpectedly, we observed comparable trends here, stated Yokoyama. One observation that aligned with expectations was the varying perceptions of the different scenarios, particularly the notion of AI weapons, which was greeted with significantly more scepticism compared to the other three scenarios. The team anticipates that the findings may pave the way for developing a universal metric to assess and contrast ethical concerns related to AI. This survey focused on Japan, yet the team has already started collecting data in various other nations. According to Assistant Professor Tilman Hartwig, a global standard would enable researchers, developers, and regulators to more effectively assess the acceptance of particular AI applications or their effects and respond appropriately. One thing I found while creating the scenarios and

questionnaire is that numerous subjects related to AI need substantial clarification, even more than we had anticipated. This illustrates that there is a significant disparity between perception and reality regarding AI.

What advantages do autonomous vehicles offer?

Self-driving cars offer several advantages that contribute to their eco-friendliness. Diminishing traffic congestion {30% less vehicles on the road).Cutting transportation expenses by 40% (regarding vehicles, fuel, and infrastructure). Enhancing walkability and quality of life. Liberating parking areas for alternative purposes (educational institutions, recreational spaces, community facilities). Lowering urban CO2 emissions by 80%.

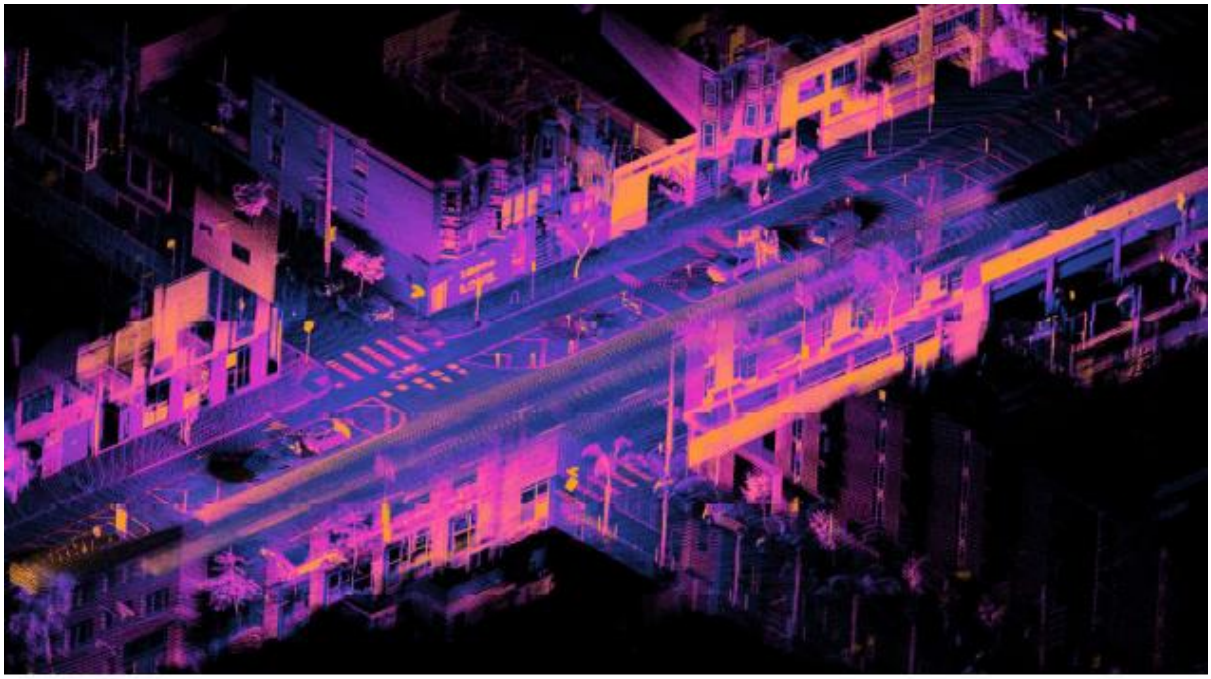
Issues with Autonomous Vehicles?

Today, we witness driverless cars becoming a reality after more than fifty years of continuous research and development efforts. However, numerous obstacles exist in creating a completely self-sufficient system for autonomous vehicles. Sure! Please provide the text that you would like me to paraphrase. Road Status: Road conditions can be very erratic and differ from one location to another. In certain areas, there are broad, smooth, and clearly marked highways. In various locations, the state of the roads has significantly worsened. The lanes lack markings, there are holes in the road and elevations. And tunnel roads where outside signals for guidance are rather unclear and similar.

By,

Naveen Prashanth.K.S,

Neela Yeswanth.



AI'S ABILITY TO UNDERSTAND 3D SPACE USING 2D IMAGES

All programs obtain visual data from cameras. Thus, if we desire Al to engage with the world, we must guarantee that it can understand what 20 images reveal about 30 spaces. In this study, we concentrate on a specific aspect of that challenge: how we can enable AI to correctly identify 30 objects—like people or vehicles—in 20 images and position those objects accurately in space. Although work might be significant for self-driving cars, it also has relevance for manufacturing and robotics. In the realm of autonomous vehicles, many current systems depend on lidar -- a technology that employs lasers to gauge distance -- for navigation. Nonetheless, lidar technology comes at a high cost. Due to the high cost of lidar, autonomous systems often lack numerous redundancies. For instance, installing numerous lidar sensors on a mass-produced autonomous vehicle would be excessively costly. However, if a self-driving car could utilize visual data to traverse its environment, it would allow for redundancy to be integrated. Since cameras are much cheaper than lidar, it would be financially practical to add more cameras, creating redundancy. Integrating it into the system to enhance safety and increase robustness. This is a real-world example. The primary breakthrough of this study: that one can obtain 30 data points from 20 objects. MonoCon is capable of recognizing 30 objects within 20 images

and enclosing them in a "bounding box," which clearly indicates to the AI the outermost limits of the pertinent object.

MonoCon relies on a significant body of prior research focused on assisting AI programs in extracting data from images. Numerous efforts educate the AI by "displaying" it 20 images and positioning 30 bounding boxes around items in the picture. These boxes are cuboidal shapes, possessing eight vertices -- consider the corners of a shoebox. During training, the AI receives 30 coordinates for each of the eight corners of the box so that it "understands" the height, width, and length of the "bounding box," along with the distance from each corner to the camera. The training method utilizes this to train the AI in estimating the sizes of each bounding box and guides the AI to determine the distance from the camera to the car. Following every prediction, the trainers rectify the AI, providing it with the accurate answers. With time, this enables the AI to become increasingly proficient at recognizing objects, enclosing them in a bounding box, and assessing their dimensions. According to Wu, what differentiates our approach is the way we educate the AI, which enhances prior training methods. Similar to earlier attempts, we position items within 30 bounding boxes during the training of the AI. Nonetheless, besides requesting the AI to estimate the distance from the camera to the object as well as the sizes of the bounding boxes, we also ask the AI to determine the positions of each of the eight points of the box and its distance from the centre of the bounding box in two dimensions. We refer to this as 'auxiliary context,' and we discovered that it aids the AI in more precisely identifying and forecasting 30 objects from 20 images. The suggested approach is inspired by a famous theorem in measure theory, the Cramer-Wold theorem.

By

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Lekkala Gouthami Sree.

DEEP FAKE

Deep fake (also written as deepfake) refers to a form of artificial intelligence utilized to produce realistic images, audio, and video deceits. The phrase, which refers to both the technology and the generated fraudulent content, is a blend of deep learning and fake. One instance of usage involves a health charity in the UK employing a deepfake to have David Beckham sends a message against malaria. This message was also communicated in nine languages. Deepfake content is produced by employing two opposing AI algorithms -- one known as the generator and the other as the discriminator. The generator, responsible for producing the fake multimedia content, prompts the discriminator to assess if the content is genuine or fabricated. Together, the generator and the discriminator create what is known as a generative adversarial network (GAN). Whenever the discriminator correctly recognizes content as being fake, it gives the generator important insights on how to enhance the next deepfake. The initial step in setting up a GAN is to determine the intended output and develop a training dataset for the generator. After the generator achieves a satisfactory level of output, video clips can be provided to the discriminator. As the generator improves its ability to produce realistic video clips, the discriminator enhances its skill at locating them. On the other hand, as the discriminator improves at identifying fake videos, the generator enhances its ability to produce them.

Until lately, video content has been harder to change in any significant manner. Since deepfakes are generated using AI, they do not necessitate the significant talent required to produce a realistic video in other ways. Sadly, this implies that nearly anyone can produce a deepfake to advance their preferred agenda. For instance, a deepfake might be employed to disseminate misleading information through a presidential candidate. Microsoft, on the other hand, has developed an AI-driven deepfake detection tool for this objective. The tool is capable of automatically examining videos and images to generate a confidence score indicating whether the media has been altered. Another potential risk posed by deepfakes is that individuals may accept these videos as genuine, leading to a loss of trust in all video content once they discover it's fake. Businesses regard deepfakes as a source of worry and interest, and it’s clear why. Nearly anyone can utilize deepfake technology to create a realistic video of an individual expressing things they never actually said. However, this emphasis on negative consequences has caused many companies to miss a new opportunity. In the end, these technologies focus on generating realistic yet artificial data that can possess genuine worth. There are uses across various sectors, including entertainment, education, health, and life sciences. By utilizing the right technological and ethical strategies, synthetic data abilities can generate considerable business worth. And today, a significant portion of that value remains unused. Similar to any technology, generative methods pose risks for both businesses and society. When organizations utilize them to tackle business difficulties and prospects, they need to do so with responsibility.

As deepfakes increasingly proliferate, society as a whole will probably have to learn to identify deepfake videos just as internet users have become skilled at recognizing other forms of fabricated news. A few signs reveal the presence of deepfakes: Present-day deepfakes struggle to convincingly animate faces, leading to videos where the person fails to blink, blinks excessively, or does so in an unnatural way.

By,

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NFT (NON FUNGIBLE TOKEN)

NFT refers to a non-fungible token, indicating that within those distinctive artworks lies a singular and non-replaceable piece of data recorded on a digital ledger through block-chain technology to verify ownership. Fundamentally, the same or comparable technology employed for crypto-currencies such as bit-coin and ether is utilized to ensure the individuality of each NFT and to establish ownership. In contrast to a unit of bit-coin, every NFT is entirely distinct, making it impossible to trade one-for-one. The file contains additional details that enhance its status beyond mere currency and allows it to encompass, well, just about anything, honestly. Consequently, NFTs (Non-Fungible Tokens) have emerged as collectible digital assets that possess value, similar to the way physical art retains its worth. Any form of easily replicable digital file can be kept as an NFT to mark the original. Duplicate. The NFTs you probably have encountered or learned about are often created from psychedelic futuristic motion graphics, but NFTs can originate from any type of photography, art, music, or video content. Even tweets and memes have been converted into NFTs. You can create NFTs from any unique item that can be stored digitally and has value. They resemble any other collectible, such as a painting or an antique action figure, but rather than purchasing a tangible object, you are paying for a digital file and verification that you possess the original version. If you strolled into a gift shop within an art gallery, you would see multiple replicated prints of renowned artworks, indeed there are certain NFTs that

function similarly. Some sections of the block-chain are legitimate, but they do not possess the same worth as the original.

NFTs will include a license for the digital asset they refer to, but this does not automatically grant copyright ownership. The copyright holder can duplicate the work, and the NFT holder receives no royalties. NFTs are currently trending among artists, gamers, and businesses in various industries. Actually, each day introduces a new participant to the NFT marketplace. For artists, entering the NFT realm offers an additional opportunity for marketing their artwork and gives fans a means to back it. At the same time, NFTs are transforming the idea of in-game transactions in video games. Until now, any digital items purchased within a game remained the property of the game company, with players acquiring them for temporary use during gameplay. However, NFTs indicate that asset ownership has transferred to the true purchaser. This implies that they can be traded on the gaming platform with additional value determined by their previous owners throughout the process. Complete games are now being created solely focused on NFTs. The NFT market is generating significant profits, but you may have heard that it also involves considerable controversy, particularly regarding its environmental impact. The generation of block-chain assets, including NFTs, requires an enormous amount of computing power - and consequently a vast amount of energy. Some are concerned about the actual effect the trend might have on the environment. Crypto-Art., a platform established to assess the carbon footprint of NFTs (currently not operational), determined that an NFT artwork titled Coronavirus used a remarkable 192 kWh during its creation. That amounts to the total energy consumption of one resident of the European Union over a two-week period.

By

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CRYPTOCURRENCY MINING

The majority of individuals perceive crypto mining merely as a method for generating new coins. Crypto mining, however, also includes verifying crypto-currency transactions on a block-chain network and recording them on a distributed ledger. Crucially, crypto-currency mining stops the double-spending of digital currency within a distributed system. Similar to physical currencies, when a member uses crypto-currency, the digital ledger needs to be refreshed by deducting from one account and adding to another. Nonetheless, the issue with a digital currency is that digital platforms can be easily tampered with. Consequently, only verified miners can modify transactions on Bit-coin's distributed ledger. This assigns miners the additional duty of protecting the network against double-spending. At the same time, new coins are created to incentivize miners for their efforts in safeguarding the network. Due to the absence of a central authority in distributed ledgers, the mining process is essential for transaction validation. Miners are thus motivated to protect the network by taking part in the transaction validation process, which enhances their likelihood of earning newly minted coins. Crypto mining resembles the extraction of valuable metals. Just as precious metal miners extract gold, silver, or diamonds, crypto-currency miners will initiate the circulation of new coins. In order for miners to earn new coins, they must use machines that tackle intricate mathematical problems presented as cryptographic hashes. A hash is a shortened digital signature of a piece of data. Hashes are created to protect

data sent over a public network. Mining race against each other to find a hash value produced by a crypto-currency transaction, and the initial miner to solve the puzzle is allowed to add the block to the ledger and claim the reward.

Every block employs a hash function to point to the preceding block, creating a continuous chain of blocks that traces back to the initial block. Consequently, network peers can effortlessly confirm if specific blocks are legitimate and if the miners who approved each block accurately solved the hash to earn the reward. As time progresses and miners utilize more sophisticated machines, the complexity of equations on the network grows. Simultaneously, the competition between miners escalates, leading to a greater scarcity of the crypto-currency as a consequence. Mining crypto-currencies necessitates computers equipped with specialized software intended for solving complex cryptographic mathematical problems. In the early days of technology, crypto-currencies such as Bit-coin could be mined using just a basic CPU (Central Processing Unit) chip on personal computers. Throughout the years, though, CPU chips have become inefficient for mining the majority of crypto-currencies because of the rising difficulty levels. GPU mining is yet another technique for mining crypto-currencies. It enhances computational strength by uniting a collection of GPUs within a single mining rig. For GPU mining, a rig necessitates a motherboard and cooling system. Due to the rising expenses associated with GPU and ASIC mining, cloud mining is gaining more popularity. Cloud mining enables individual miners to take advantage of the resources of large corporations and specialized crypto mining operations. The skilled miners who earn the highest rewards are always analysing the market and refining their mining techniques to enhance their results.

By,

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Arthi.M.

MORAL PRINCIPLES

A person's character and habits reveal much about their ethics. It concerns the substance of moral evaluation. The mind-set of individuals is shaped according to the prevailing moral and ethical standards. A child must learn which behaviours are acceptable in society. This should be carried out to ensure there is a correct route that one must take. When an individual understands what is right and wrong, making choices based on that knowledge will aid in their development. The people around him have a profound influence on one character. Therefore, it is essential to create a pleasant and welcoming atmosphere. In addition to personal growth, strong ethics also benefit one's career. Regardless of whether you own a business or work as an employee, strong ethics consistently provide an advantage in navigating any circumstance. Instances of work ethics involve adhering to the guidelines and regulations established by the authorities. Appropriate conduct, neat attire, and courteous language are encompassed in this; every individual you engage with deserves to be treated with respect. Ethics directs us to speak truthfully and uphold our commitments. Every individuals unthinkingly adhere to the moral standards set by society. They adhere to practices deemed positive according to moral standards. Nonetheless, some individuals challenge these values and follow what they believe to be right or wrong.

By,

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DEEP LEARNING STRUCTURE

Deep Learning utilizes multilayer neural networks that can autonomously recognize key features and learn from vast datasets to address intricate challenges. Are you a Deep Learning enthusiast? Want to build your own neural networks or leverage transfer learning to utilize existing models? Here is a compilation of the most thoroughly documented, endorsed, and valuable deep learning frameworks!

TensorFlow: Created by the Google Brain team, this is one of the most popular frameworks for constructing neural networks. Straightforward abstraction, quantifiability, and compatibility with applications make it one of the simplest options!

Keras: This accessible and open-source library is great for research because it provides easy APIs, modularity, and the ability to extend functionalities.

PyTorch: This amazing framework provides scalable distributed training and performance enhancement in both research and production with the "torch distributed" backend.

Theano: This framework is closely linked with NumPy and focuses on the CUDA cores provided by NVIDIA.

DeepLearning: This framework is recommended for users of Java, Scala, C++, and C. It is most recognized for distributed training that takes place in clusters.

Caffe: Caffe is developed in C++ and provides a Python interface, commonly applied for image identification and categorization.

Chainer. Crafted entirely in Python, it is most renowned for operating across several GPUs with minimal effort.

Microsoft CNTK: This framework is optimized for speed and efficiency, constructing a neural network through a sequence of computational steps using a direct graph.

By,

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