FemBit

Year 2023-24 A Technical Newsletter by Department Of Computer Engineering
Government Polytechnic for Girls , Ahmedabad Date: 15/07/2024

About Institute & Department

Institute Vision

To carve a brighter prospect for the nation through excellence in technical education for fostering skills, ethical values and environmental consciousness among girls while undertaking existing and forthcoming challenges.

Institute Mission

To nurture technical and creative skills through quality education

To strengthen industries interaction

To impart real life problem solving skills.

Department Vision

To instill technical skills among students through excellence in education and develop them as computer professionals for forth coming challenges with moral values, environmental and societal consciousness.

Department Mission

To impart quality education for developing technical skills.

To create awareness on emerging trends and technologies.

To cultivate a sense of social responsibility with ethical and strong moral values.

Inside the Issue

Department

Computer Faculties

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Technical Articles

Digital Revolution: Technology, Power, & You

The digital revolution has already changed how people live, work, and communicate. And it's only just getting started. But the same technologies that have the potential to help billions of people live happier, healthier, and more productive lives are also creating new challenges for citizens and governments around the world. From election meddling to data breaches and cyber attacks, recent events have shown that technology is changing how we think about privacy, national security, and maybe even democracy itself. In this project, we examine challenges in five key areas that will shape the future of the digital age: justice system, impact on democracy, global security and international conflict, the impact of automations and AI on the jobs marketplace, identity, and privacy.

Why worry about a digital ID when you're walking around with a surveillance device in your pocket?

You're a college going student in India. When your alarm goes off at 7 am, you do what most people do: you pick up your phone. You check your social media. You look at your calendar, fire off a couple of messages, roll out of bed, and hop in the shower. As you head out the door to work, you pop in your ear buds, open your favourite music-streaming service and turn up your Spotify.
Each piece of data adds to vast digital dossier that is already hard for most people to comprehend, much less control. And it's not just your phone – your car, your thermostat, your fitness tracker, and the checkout where you swipe your debit card on your morning coffee run are all sending information about you back to headquarters, where it can be aggregated and analyzed.

Who *owns* your digital identity?

It's your photograph. Your location. Your playlist that you've had on repeat since you woke up this morning. The bits of information vacuumed up by the apps you rely on in your day-to-day life may not be part of your official identity, like a government ID number or an iris scan on file with the border patrol. But in some ways, they're even more powerful. Companies or governments who can access enough of them can not only piece together who you are, they can gain valuable information about your political affiliations and consumer preferences.

Should you have the right to be forgotten?

Let's say five years ago you were arrested for a minor offense. The next day, your mug shot appeared on a local news website. You paid a fine and eventually forgot about it. But the internet didn't. Now you've you're about to apply for a new job, and your mug shot still appears at the top of a popular search engine's results whenever someone types in your name. Should you have the right to request that your photo and search results be deleted? The European Union thinks so – its data protection rules include a "right to be forgotten" that allows people to ask websites to delete personal information that is outdated, or that they don't want others to see. But where does the right to be forgotten cross the line into stifling free speech?

Where should societies draw the line between privacy and security?

The information that people voluntarily give away about themselves online is just the beginning. In a growing number of cities around the world, just driving down the street or showing your face can result in your personal information being *involuntarily* scooped up by a computer.

Anshu Patel(226150307086), Semester 3

Edge computing is a distributed computing paradigm that brings computation and data storage closer to the location where it is needed, improving response times and saving bandwidth. This approach reduces latency, improves efficiency, and enhances the performance of various applications, particularly those requiring real-time processing and low latency.

Applications of Edge Computing

IoT (Internet of Things):
Edge computing is crucial for IoT applications, where sensors and devices generate massive amounts of data that need to be processed quickly for real-time decision-making. Examples: Smart homes, industrial automation, and connected cars.
Healthcare: Enables real-time monitoring and analysis of patient data from wearable devices, leading to faster response times and improved patient outcomes. Examples: Remote patient monitoring, telemedicine.
Smart Cities: Facilitates efficient management of urban infrastructure and services through real-time data processing from various sensors and devices deployed throughout the city.
Examples: Traffic management, energy consumption monitoring, public safety systems.
Retail:
Enhances customer experiences by enabling personalized services and real-time analytics within stores. Examples: Real-time inventory management, personalized marketing.
Gaming and Augmented Reality (AR)/Virtual Reality (VR):Reduces latency for a smoother and more immersive user experience in gaming and AR/VR applications. Examples: Cloud gaming, AR/VR applications in training and education.
Benefits of Edge Computing are Reduced Latency by processing data closer to its source, edge computing minimizes the delay in data transmission, which is critical for real-time applications.
Bandwidth Optimization:
Reduces the amount of data transmitted to central servers, saving bandwidth and reducing associated costs.
Improved Reliability:
Local processing ensures that applications can continue to function even when the connection to the central server is slow or intermittent.
Enhanced Security and Privacy:
Keeping data closer to the source can enhance security and privacy by reducing the exposure of sensitive data to potential threats during transmission.
Challenges and Considerations
Security:
While edge computing can enhance security by keeping data local, it also introduces new security challenges, such as securing numerous edge devices and ensuring data integrity across distributed networks.
Management Complexity:
Managing a distributed network of edge devices can be more complex than centralized systems, requiring robust monitoring and management solutions.
Interoperability:
Ensuring that various edge devices and systems can work together seamlessly is a significant challenge, necessitating standardized protocols and interfaces.
Scalability:
As the number of edge devices grows, scaling the infrastructure to handle the increased data load and processing requirements can be challenging.

Future of Edge Computing

•5G Integration:
The deployment of 5G networks is expected to accelerate the adoption of edge computing by providing faster, more reliable connectivity, which is essential for real-time applications.
AI and Machine Learning:

Integrating AI and machine learning at the edge can enhance data processing capabilities, enabling smarter and more autonomous systems.

- Industry Adoption:
- As industries continue to adopt edge computing, innovative applications and use cases will emerge, driving further advancements in

technology and infrastructure.

Conclusion

Edge computing represents a significant shift in how data is processed and managed, bringing computation closer to the data source to improve efficiency, reduce latency, and enhance security. As technology advances and the demand for real -time processing grows, edge computing will play an increasingly critical role in various industries, from healthcare to smart cities. While challenges remain, ongoing developments in connectivity, AI, and infrastructure are set to drive the evolution and adoption of edge computing, unlocking new possibilities and transforming the digital landscape.

Chauhan Ritika(236140307014) Semester 1

Quantum Machine Learning

Quantum computing will intersect with machine learning, enabling businesses to leverage quantum algorithms for pattern recognition, optimization, and predictive analytics. Quantum machine learning algorithms will unlock new insights from large datasets, accelerate model training processes, and enable more accurate predictions in various domains. Business owners should explore the integration of quantum machine learning into their data analytics and decision-making workflows to drive innovation and competitive advantage.

Quantum machine learning holds the promise of transforming the landscape of data analysis and artificial intelligence. While significant challenges remain, the potential benefits of faster processing, enhanced capabilities, and novel approaches are driving intensive research and development. As technology advances and quantum systems become more practical, QML is poised to revolutionize various industries, offering solutions to problems that are currently beyond the reach of classical computing. The future of QML is both exciting and pivotal, with the potential to unlock new frontiers in technology and innovation.

Zeel Pandya(236140307068) Semester 1

India at the forefront : Digital Revolution

The digital revolution has already changed how people live, work, and communicate. And it's only just getting started. But the same technologies that have the potential to help billions of people live happier, healthier, and more productive lives are also creating new challenges for citizens and governments around the world.

India is at the forefront of the digital revolution, leveraging on digital public infrastructure, a vibrant financial technology (FinTech) ecosystem and a conducive policy environment to emerge as the fastest-growing digital economy in the world, wrote officials of the Reserve Bank of India (RBI) said in the Report on Currency and Finance (RCF) for the year 2023-24 which was released on Monday.

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Digital technologies are unlocking opportunities in financial inclusion, fiscal transfers and cross-border trade and remittances, it added in the report.

The theme of the Report is "India's Digital Revolution".

As per the report the positive role played by the regulatory framework has led to increasing confidence of consumers in digital financial products, boosting operating and technical efficiencies of financial institutions.

However, digital technologies also present challenges related to cybersecurity, data privacy, vendor and third-party risks, customer protection, upskilling and reskilling of human resources, complex financial products and business models, the report highlights.

“India is leading the global digital revolution, emerging as a frontrunner on the back of its robust digital public infrastructure, rapidly evolving institutional arrangements, and a growing tech-savvy population,” Shaktikanta Das, Governor, RBI said in the forward.

Patel Khiloni (216140307053) Semester 6

Chain it with Blockchain

Blockchain is a decentralized digital ledger technology that records transactions across a network of computers in a way that ensures data security, transparency, and immutability. Each record, or block, is linked to the previous one, forming a chain. The distributed nature means no single entity controls the entire blockchain, enhancing trust and security. Blockchain operates by validating and recording transactions through a consensus mechanism (e.g., Proof of Work or Proof of Stake). When a transaction occurs, it is broadcast to a network of nodes. These nodes verify the transaction's authenticity and, once validated, add it to a block. This block is then appended to the existing chain in a way that is cryptographically linked to the previous block.

Cryptocurrency: Bitcoin, the first major application of blockchain, revolutionized the concept of digital currency. Other popular cryptocurrencies include Ethereum, Litecoin, and Ripple.

Smart Contracts: These self-executing contracts with the terms of the agreement directly written into code enable automation and trust without intermediaries (e.g., Ethereum blockchain).

Supply Chain Management: Blockchain improves transparency and traceability in supply chains, helping to track goods from origin to destination.

Finance: Blockchain facilitates faster and more secure financial transactions, cross-border payments, and the development of decentralized finance (DeFi) platforms.

Healthcare: Blockchain can securely store and manage patient data, enhancing privacy and data -sharing capabilities.

Voting Systems: The technology has the potential to create more secure and tamper-proof electronic voting systems.

Blockchain technology is evolving beyond cryptocurrencies into areas like Web3, where decentralized platforms and services are being created. Innovations such as more energy-efficient consensus protocols (e.g., Proof of Stake) and interoperable blockchains are helping address challenges and expand the use cases of the technology.

5G Expansion

The next emerging technology trend is 5G! The fifth generation of mobile networks, 5G, promises significantly faster data download and upload speeds, wider coverage, and more stable connections. The expansion of 5G is facilitating transformative technologies like IoT, augmented reality, and autonomous vehicles by providing the high-speed, low-latency connections they require. This technology is crucial for enabling real-time communications and processing large amounts of data with minimal delay, thereby supporting a new wave of technological innovssation.

The expansion of 5G technology is a significant leap forward in telecommunications, promising faster data transfer speeds, reduced latency, and the potential to enable new applications across industries. Here’s an overview of the key aspects of 5G expansion:

1. Increased Speed and Bandwidth

Data Transfer: 5G networks are designed to be up to 100 times faster than 4G, with theoretical peak speeds of up to 10 Gbps.

Technical Articles

Capacity: 5G offers greater bandwidth, allowing for more devices to connect simultaneously without congestion, supporting IoT devices and smart city applications.

2. Lower Latency

Reduced Lag: Latency in 5G can be as low as 1 millisecond, which is crucial for real-time applications like autonomous vehicles, augmented reality (AR), and telemedicine.

Enhanced Performance: This low latency improves the experience for applications that require quick response times, such as gaming and virtual reality (VR).

Infrastructure and Deployment Challenges

Small Cells: Unlike 4G, which relies on large cell towers, 5G requires a dense network of small cell stations due to its reliance on higher-frequency millimeter waves that don't travel as far.

Cost and Investment: Significant investment in infrastructure is needed, which poses challenges for network providers, particularly in rural and underserved areas.

Applications and Use Cases

Smart Cities: 5G can support large-scale sensor networks for traffic management, public safety, and efficient energy use.

Healthcare: It enables remote surgeries and real-time health monitoring with reliable, high-speed connectivity.

Industry 4.0: Manufacturing and logistics benefit from 5G with enhanced automation and real-time data processing.

5. Global Rollout and Variability

Different Paces: Countries vary in how quickly they are deploying 5G. Some have rolled out national networks, while others are still in early stages.

Regulatory Concerns: Spectrum allocation and international standards need alignment to ensure seamless global connectivity.

Security and Privacy Concerns

Potential Risks: The rapid deployment raises concerns about network security and potential vulnerabilities, leading to a need for stronger cybersecurity measures.

Vachhani Krisha(226140307140), Semester 4

Technical Articles

Generative AI

Generative AI: The Future of Content Creation

Generative AI, the latest breakthrough in artificial intelligence, is poised to revolutionize the world of content creation. By leveraging advanced language models and image generation capabilities, this technology is empowering creators, businesses, and individuals to produce high-quality, personalized content at unprecedented speed and scale. From writing to visual design, the potential of generative AI is limitless, and its impact on the creative industry is set to be profound.

Generative AI refers to a type of artificial intelligence that can produce content, such as text, images, music, or even code. It uses complex models like neural networks to learn from existing data and create new outputs that mimic human creativity. Popular examples include OpenAI's GPT models, DALL-E, and other machine learning models capable of producing high-quality content.

Generative AI models are typically trained on vast amounts of data using machine learning algorithms. Techniques such as deep learning and neural networks enable these models to recognize patterns and relationships in the training data. Once trained, these models can generate content based on prompts or inputs from users.

Key types of generative AI include:

- Language Models: Create human-like text, respond to queries, write articles, or code (e.g., ChatGPT, Bard).

- Image Generators: Create images from text prompts or modify existing images (e.g., DALL-E, Midjourney).

Music Generators: Compose music based on a given style or genre.

Code Generators: Assist developers by creating code snippets or entire programs (e.g., GitHub Copilot).

3. Applications of Generative AI:

Content Creation: Generative AI is widely used to create blog posts, articles, social media content, and product descriptions, helping individuals and businesses produce high-quality content quickly.

Art and Design: Artists and designers use AI to generate creative concepts, images, and visual content that can inspire or be used directly in projects.

Entertainment: Scriptwriting, video game storylines, and character generation are some creative applications in film and gaming industries.

Coding and Development: AI-powered tools assist developers in writing and debugging code, streamlining the software development process.

Education: Generative AI can create personalized learning experiences, generating study guides, quizzes, and teaching materials tailored to individual needs.

Customer Service: Chatbots and virtual assistants use generative AI to simulate human conversation and improve user experience.

Marketing and Advertising: Generative AI assists in producing targeted ad copy, email campaigns, and market analysis.

Bhanushali Priyanshi(216140307055),

Semester 6

Outstanding Students
GTU Exam Winter 2023 (Sem 1,3 ,5) & Summer 2024(Sem 2,4,6)

1st SEMESTER

SPI OUT OF 10

236140307014	CHAUHAN RITIKA PARESHKUMAR	10
236140307065	PANCHAL NAMASVI DIPAKBHAI	10
236140307068	PANDYA ZEEL NEERAJBHAI	10

2nd SEMESTER

SPI OUT OF 10

236140307065	PANCHAL NAMASVI DIPAKBHAI	10
236140307014	CHAUHAN RITIKA PARESHKU-MAR	9.8
236140307068	PANDYA ZEEL NEERAJBHAI	9.6
236140307034	KADAMBANDE MAHI PRASHANT	9.8

3rd SEMESTER

SPI OUT OF 10

226140307116	RAVAL DHRUVI NITINKUMAR	10
226140307065	MOMIN TAHSEEN GULZARAHMED	10
226140307086	PATEL ANSHU GAURANGKUMAR	9.95

4th SEMESTER

SPI 10 OUT OF 10

226140307128	SIDDIQUI AYANAM HAFIZMIYA	9.9
226140307115	RATHVI HETVI MANOJBHAI	9.9
226140307086	PATEL ANSHU GAURANGKUMAR	9.81

5th SEMESTER

SPI OUT OF 10

216140307065	BHURIYA JANVI RAMESHBHAI	9.71
216140307055	BHANUSHALI PRIYANSHI KHIMJIBHAI	9.33
216140307078	SHAIKH BUSHRA ASIF	9.38

6th SEMESTER

SPI OUT OF 10

216140307055	BHANUSHALI PRIYANSHI KHIMJIBHAI	10
216140307078	SHAIKH BUSHRA ASIF	9.78
216140307018	VAGHASIYA TANVI VIJAYBHAI	9.78

Events @ Department

Techotsav 2024

Techotsav 2024 is a dynamic three-day technology festival scheduled from April 24th to 26th, featuring a diverse array of events designed to engage participants in various aspects of technology and innovation. On the first day, activities include "Byte & Write," a coding and writing competition, and "Tech Titans," a tech quiz, both held in L1, alongside "Game Storm" and "Cyber Shelter," gaming and cybersecurity challenges in L2. The second day focuses on showcasing creativity and ideas with the "Innovation Expo" and "Ideas Symposium," both taking place in MR. The final day features "Robo Rampage," a robotics competition in LRUC, followed by "Logic Link," a logic puzzle contest, and "Pro Gamers," a competitive gaming event, both in L2, concluding with "Tech Detective," a mystery-solving competition in LRUC. This event promises to highlight technical skills and innovative thinking through a variety of engaging and competitive activities.

Events @ Department

Sr. No	Title	Company
1	Android:Event handling	Brainy Beam
2	Android	Brainy Beam
3	Android with SQLlite Database	Brainy Beam
4	K-NN Algorithm	Brainy Beam
5	Feature Subset Selection & sklearn Library	Brainy Beam
6	Workshop on Graphics & UI/UX Design	Red & White Multimedia Education
7	Machine learning	Brainy beam
8	Seminar on GTU Robotics	GTU Robotics Club
9	Web Designing Using Python	Tops Technologies
10	Workshop on Cyber security	Freelancer
11	IBM Orientation	IBM
12	Cloud Computing	Brainy beam
13	Software Development Lifecycle & Agile model	Freelancer

Event Photos

Web Designing Using

Android Event Handling

GTU Robotics Seminar

Industrial Visit @ E-infochips

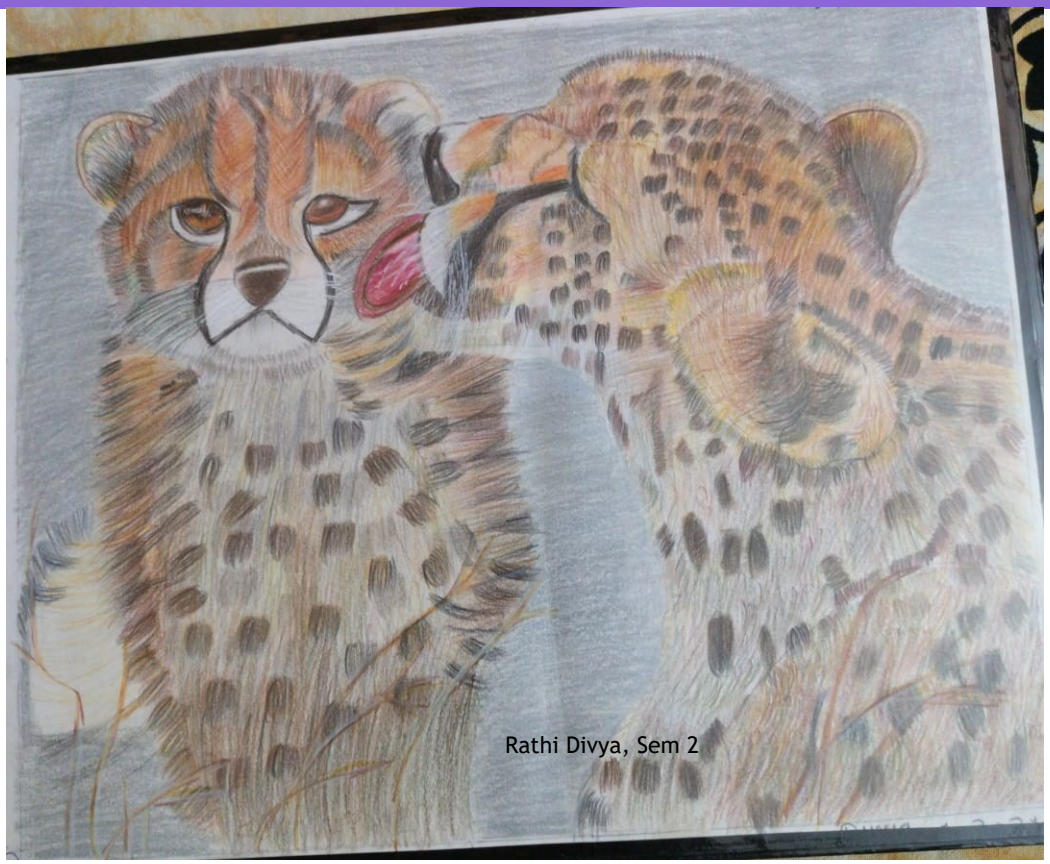
Students Achievement

Riya Shah of Sem 4 obtained a certificate from John Hopkins University for competing a course on Psychological First Aid.

One Student Kikani Helly secured ranks among top 10 students in various GTU exams.

		SPI	Remarks
206140307008	KIKANI HELY NILESHBHAI	10	4th Rank in Computer Branch GTU Top 10 in Summer 2023
206140307008	KIKANI HELY NILESHBHAI	10	8th Rank in All Branch GTU Top 10 in Summer 2023
206140307008	KIKANI HELY NILESHBHAI	10	10th Rank in All Branch GTU Top 10 in Winter 2022
206140307008	KIKANI HELY NILESHBHAI	10	6th Rank in Computer Branch GTU Top 10 in Winter 2022

Students Creativity Corner



Rathi Divya, Sem 2

Students Creativity Corner

Kunjal Panchal, Sem 4

Rathi Divya, Sem 2

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Under

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Education Department

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Affiliated with Gujarat Technological University

Ahmedabad

A Newsletter Of The Department Of Computer Engineering at The Government Polytechnic for Girls

Ahmedabad

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Newsletter Editorial Committee....