
THE
ALGORITHM
7TH EDITION

FROM THE EDITOR'S DESK

In today's world, technology is more than just a tool—it is a storyteller, a creator, and sometimes, even a disruptor. As we stand on the edge of this digital frontier, 'Algorithm' is here to capture the stories where tech and creativity collide, bringing you fresh perspectives on how innovation is defining the world around us.

From the clever strategies of Whitehat hacking to the cultural impact of Deepfakes, we examine how technology is not just a tool but a powerful force shaping modern society. In Computational Design, we see architecture reimagined through algorithms, while AI adoption raises important questions about ethics and responsibility. We also highlight the push for sustainability with Green Computing and explore the synergy between humans and machines in Hybrid Automation. Education is getting a high-tech makeover through Augmented Reality, and space exploration takes an exciting turn with Vyommitra, ISRO's humanoid astronaut. Finally, we celebrate the creativity unleashed at the intersection of art and technology, where the lines between innovation and imagination blur.

Before I close, I would like to extend heartfelt gratitude to our Computer Science department for their unwavering support. A special thanks to Vedika and Jashvi for their valuable contributions to making this magazine a success. I also owe a big thanks to our language editor, Mrs Smita Chandela, whose meticulous attention to detail ensured every article reads smoothly and clearly.

Each article is crafted to provoke thought, spark curiosity, and inspire a deeper appreciation for the technology shaping our world today. I hope you enjoy the read.

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THE IT COORDINATOR'S NOTE

"In a world that's increasingly driven by data, the line between convenience and vulnerability is as thin as a keystroke."

As a person who keeps technology going around smoothly in the school, I must mention how cyber safety is crucial when technology is rapidly evolving. The digital world is vast and holds many promises, yet it harbours significant risks, especially regarding the frauds of cyberspace and instances of data breaches. Phishing scams, identity theft, and ransomware attacks have reached high levels of sophistication in their approaches to jeopardise people's and companies' identities.

It is also very important that students know the basic safety measures that should be followed, like online suspicious emails, picking passwords that are tough to guess, and using that extra security step called two-factor authentication. Cybersecurity is not just a mere technical problem but a shared responsibility where awareness works as our best defence.

While all this is going on, the emerging technologies of AI, blockchain, and quantum computing are changing industries in their image, unlocking possible innovations for or through them. These emerging technologies are going to change the game in a big way, but such powerful technologies demand stronger cybersecurity, too. AI can do some amazing stuff, but it's like a double-edged sword – it can help us out, but it can also be used by hackers to cause even more trouble. Blockchain has an interesting security feature for transactions, but it's still in the early stages.

So, let's get pumped about the future, but let's not be naive about it either. Being informed about these technologies and their impact is like being aware of the both sides of a coin. We will have to alert and mindful about using IT responsibly. It's all about keeping that balance between playing with the new gadgets and making sure we do not leave the door wide open for trouble.

Nishant Vinayak Gupta
IT Coordinator

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The New Face of Fiction:
How Deepfakes Are Distorting Pop Culture

What started as an eerie technological experiment - 'Deepfakes', has morphed into a pop culture phenomenon, revolutionising how we consume media and raising unsettling questions. Can we trust what we see on our screens anymore? Deepfakes were mostly an internet novelty when they first appeared in the late 2010s. Early deepfakes, which employed artificial intelligence (AI) to swap faces in videos, were mostly used for lighthearted entertainment. For example, Reddit users would make fake movie mashups, etc. However, deepfake technology—which is driven by machine learning—matured swiftly, and it soon became apparent that it could be used for both digital fraud and imaginative narrative.

The resurrection of Carrie Fisher's Princess Leia for Star Wars' "Rogue One" (2016) may have been one of the most widely publicised examples of deepfakes. Fisher had already passed away. While some felt uncomfortable with bringing performers "back from the dead" without their permission, others applauded it as a heartfelt tribute. We are entering a world where actors don't even need to be alive to star in new projects since it is possible to replicate anyone's likeness. The idea of a world where everyone, living or dead, may appear on film has both thrilling and terrifying potential effects on entertainment.

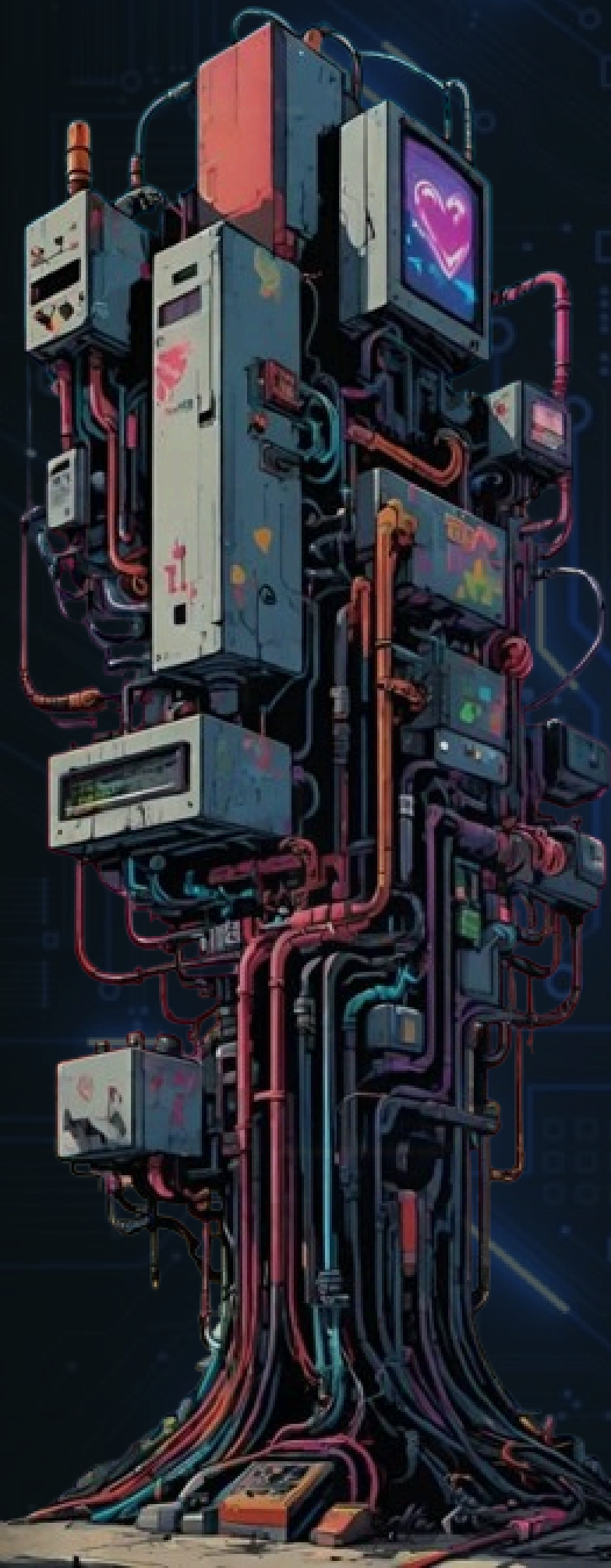
Deepfakes have also hurt celebrities. Recently, videos of Tom Cruise purportedly showing his "digital twin" pulling stunts and saying strange things, that Cruise would never say, went viral on TikTok. The videos were convincing enough to start discussions on the likelihood that we will live in a world in which it will be impossible to tell the difference between reality and a deepfake.

Deepfakes' negative aspects have sparked major worries about permission, privacy, and the improper use of artificial likenesses. Celebrities are suddenly confronted with the painful reality that their public image can be changed in ways they never intended, making them exposed to digital exploitation. Could we soon see fake videos of celebrities endorsing products they've never touched? Or are world leaders making dangerous statements that never happened?

In a world where deepfakes can entertain, deceive, and even manipulate, we are left with a critical challenge: balancing innovation with integrity. As deepfakes evolve, so too must our scepticism of the content we consume. Because, as we've learned, seeing is no longer believing. So, can you trust what you see? If deepfakes continue to weave themselves into the fabric of our pop culture, the answer may increasingly be: not always.

Meher Sethi
P/2527
X-B

Computational Design in **Architecture**



Computer Science has transformed architecture by introducing new tools and methods that improve design, construction, and management. Architects now use software like AutoCAD and Revit to create detailed 3D models, which allows them to visualize better and spot problems early. With BIM, stakeholders can access real-time information, and by making fewer errors. Building Information Modeling (BIM) represents architectural design. This teamwork among architects, engineers, and contractors, makes sure that the project runs smoothly and everyone is on the same page.

Computer Science also plays an important role in structural analysis. This data ensures that the buildings are not only beautiful but also very strong and safe. Software tools that assess energy use and carbon footprint are important in computer architecture because they help designers create greener designs that safeguard the environment. Software that assesses carbon footprints and energy usage prioritizes sustainability. In conclusion, the integration of Computer Science in architecture promotes efficiency and creativity, leading to safer, smarter, and more sustainable buildings.

Ananya Agrawal
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IX-C

What are the potential drawbacks and challenges associated with the widespread adoption of artificial intelligence?

To fear that the data we put on the internet are all digital footprints that can be manipulated by AI and can risk or hack someone's bank account details or falsely accuse someone of a crime not committed by them and put their life in a critical situation. AI is capable of affecting an individual's mental health. From limiting people from thinking about new ideas to taking away their jobs is horrific.

Taking into consideration, the wise words from “Elon Musk”, Artificial Intelligence is **one of the biggest threats** to humanity. There are two sides to a coin, the integration of AI into various aspects of our lives brings about numerous advantages, but it is not without its share of disadvantages. One prominent concern centers around violating personal information, highlighting the ethical challenges and potential privacy infringements associated with AI systems.

Furthermore, the use of AI in various applications, such as facial recognition and predictive analytics, raises concerns about the potential misuse of personal data. Facial recognition technology, for example, can identify individuals based on their unique facial features. When employed without proper safeguards, this technology can be abused for intrusive surveillance, tracking individuals without their knowledge or consent, and infringing upon their right to privacy.

To address these challenges, there is a growing call for robust privacy regulations and ethical guidelines governing the development and deployment of AI technologies. Stricter data protection laws, transparency requirements, and accountability measures are essential to safeguard individuals' privacy in the age of AI.

In contemplating the future, while Artificial Intelligence brings about transformative advancements, it is crucial to recognise and address the disadvantages associated with potential personal information violation. By fostering ethical practices and implementing robust safeguards, we can ensure that the integration of a meticulously articulated AI respects the fundamental right to privacy.

Tanisha Tibrewal
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Remodeling the Virtual Panorama

Cloud Computing has revolutionised the way agencies and people store, manipulate, and process information. By offering on-demand access to a shared pool of configurable assets, cloud services have not only increased operational performance but also reshaped enterprise fashions across diverse sectors.

The adoption of cloud computing brings numerous advantages:

- **Cost efficiency:** Groups can reduce capital expenditures by moving their infrastructure to the cloud and choosing a pay-as-you-move version that scales with their desires.
- **Scalability:** Business enterprises can quickly scale resources up or down based totally on demand, making sure flexibility and powerful aid allocation.
- **Accessibility:** Cloud services may be accessed from anywhere with a web connection, facilitating faraway work and collaboration.
- **Better protection:** Legitimate cloud carrier carriers invest in sturdy protection protocols, imparting higher data protection compared to traditional in-house system challenges.

Despite its advantages, cloud computing isn't without challenges. Statistics, privacy issues, compliance with regulations, and ability downtime can pose full-size risks. Companies have to cautiously compare their cloud carrier issuer's security features and carrier-level agreements.

As Cloud Computing continues to conform, it remains a pivotal motive force of virtual transformation throughout industries. Embracing this era can permit businesses to leverage records extra efficiently, innovate hastily, and maintain an aggressive edge in an increasingly more digital marketplace. As the cloud era advances, its potential to reshape the future of computing and enterprise operations is undeniably vast.

Vaanya Gupta
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IX-B

GREEN COMPUTING: THE FUTURE OF IT

We humans are a species that has been evolving since the beginning. Our ancestors would never have imagined the inventions and discoveries we have made when they stayed here. However, in this course of multiple inventions, we have delved so deep into this new Era of technology that we have failed to understand its negative impact on Mother Earth.
The list is endless, including land, water, and air pollution, industrial emissions, etc. For instance, a smartphone takes around 12,760 litres of water for its production, manufacturing, making, etc. This is just a glimpse of what all waste is produced. Now, to help in being more sustainable and taking care of our ecosystem, "The US Environmental Protection Agency" introduced Green Computing.

What is Green Computing?
Green Computing, often synonymously used for sustainable computing, usually involves techniques or applications which involve minimal environmental damage. Green computing practices focus on energy-efficient design, resource-conscious manufacturing, and virtualisation to minimise energy use and environmental impact.

The implications of green computing extend beyond just conserving energy and reducing waste. Businesses that adopt these practices often find that they save on operational costs and enhance corporate reputation, which can be critical in today's ecologically conscious market.
Green Computing not only promotes sustainability but also offers substantial benefits in terms of operational efficiency and compliance with environmental regulations.

Green Computing is integral to fostering a sustainable future by blending eco-friendly practices with technological advancements. By investing in energy-efficient hardware, virtualization, and renewable energy, businesses can dramatically reduce their environmental impact while optimizing operational efficiency.

Dia Choudhary
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IX-D

Ethical Hacking

What is Ethical Hacking?

Ethical Hacking involves testing computer systems and networks for cyber loopholes using techniques similar to malicious hackers ethically. Their goal is to close the open doors before the cybercriminals can exploit them, allowing organisations to protect sensitive information and hold the trust of clients.

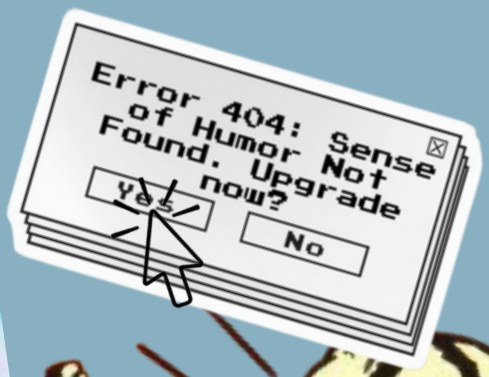
The White Hat Techniques

- **Network Scanning:** Imagine using a metal detector on the beach. White hat hackers scan networks to find "open doors" where bad guys could enter. If they find any, they let the company know to close them!
- **Password Cracking:** Assessing everyone's passwords and helping them create a secure and firm password following standard code and also strengthening password management practices. This is like guessing the secret code in a diary. White hat hackers check if passwords are strong enough. If they can guess a password, they help people create better ones that are harder to crack.
- **Source Code Review:** Think of source code as a recipe for your favourite dish. White hat hackers read through the recipe (the code) to find mistakes that could let bad guys in. They help fix any issues before anyone uses them!
- **Penetration Testing:** Imagine playing a video game where you try to break into a castle. White hat hackers do the same thing but with permission! They pretend to be bad guys to find weak spots in computer systems so real hackers can't sneak in.
- **Vulnerability Assessment:** Think of this like a treasure hunt for problems. White hat hackers search for bugs or mistakes in a system that could let bad guys get in. When they find these problems, they help fix them.
- **Social Engineering:** This is like trying to trick someone into giving you their secret code. White hat hackers send fake messages to see if people will accidentally share important information. This helps teach workers to be careful and not get tricked.

The prime players in combating cybercrime are hackers named ethical hacking and white hat hackers. They are the helpers who assist organisations in identifying, addressing and mitigating security risks through pen testing and social engineering. With time, the role of a clever, ethical hacker is becoming extremely important to safeguarding the digital world and confidential information.

Freya Amar Shah
P/2977
IX E

WORD SEARCH



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Hybrid automation in RPA

Robotics and automation are combined in Robotic Process Automation (RPA), a software system that manages repetitive operations, including data entry, transaction processing, and report preparation. Business process automation (BPA) uses a program or "bot" that mimics an employee's desktop activities by interacting with an interface in a manner similar to that of a human.

Combining the best features of both attended and unattended RPA, hybrid RPA offers the flexibility to automate operations involving a combination of autonomous and human intervention. It's the perfect solution for scenarios where some tasks can be completed automatically without oversight while others need human oversight or judgment.

Businesses may take benefit of the benefits of both attended and unattended automation with Hybrid RPA, creating a well-rounded automation approach that fits their unique requirements. With the help of this strategy, organisations can increase efficiency and agility by optimising a variety of processes across several departments.

For retail, a hybrid RPA is a great choice because it can greatly simplify inventory management. While unattended bots manage inventory replenishment and order fulfilment procedures, attended bots help store staff with responsibilities like order tracking and stock level updates.

Riddhisha Chhabra
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IX-D

Augmented Reality in Education

Augmented Reality(AR) in education allows a person to be immersed in realistic experiences, which makes the learning process more active, effective and meaningful. It refers to the digital information and interactive learning environment. It enhances the educational experience by overlaying digital content such as images, sounds, videos and 3D models as well as physical objects and devices like AR glass.

AR has emerged as a transformative technology in various fields, with education being one of the most promising areas. It is used in many different industries and for many different objectives, such as collaboration, increased visualisation, interactive learning, and hands-on experiences. It is an application that can be used in the classroom to help students learn more effectively and to better represent a variety of works while also maintaining their experiences and learning progress at the appropriate level.

This technology is likely to be seen in our real-world applications as it bridges the gap between theoretical knowledge and practical application, which helps a student visualise deeper into their career. Through apps such as Google Expeditions, one can bring history to life by enhancing engagement with the past as well as embarking on field trips to various historic sites.

Overall, it holds immense potential to revolutionise education by making learning more interactive, engaging, and effective. Its benefits are significantly enhancing the understanding and retention of knowledge in students. It promises to redefine the educational landscape, paving the way for a more interactive and immersive learning experience.

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IX-E

Vyommitra

ISRO has designed an unprecedented humanoid robot called Vyommitra that will assist and test the systems for its upcoming Gaganyaan manned space mission. Vyommitra, being a female robot astronaut, will play a crucial role in simulating human functions while ensuring safety and functionality in outer space.

This Female Robot Astronaut, said the Minister, is equipped with the capability to monitor Module Parameters, issue Alerts and execute Life Support operations. The advanced robot astronaut is designed to monitor module parameters, give out alarms and execute life-support activities.

The Robot has been designed with aspects to mimic the human form while simulating their biological functions as well as interacting with the important systems involved during space missions with a view to developing better safety and functioning in space missions.

Vyommitra is classified as a semi-humanoid robot, which means it has the form of a human but with an easily simplified form minus the functionality to propel itself using legs, thus making it very efficient in microgravity.

This streamlines its meaningful activity to make it specific in mission deployment in space. That very notion of putting Vyommitra through such pre-mission tests will explain to an extent the meaning behind human interaction with spacecraft systems. ISRO would then gather precious data for further human spaceflight missions. The design Vyommitra is uniquely engineered to be specific, with focused functionality, emotional capabilities, and a testing role exclusively tailored to the unique requirements of the Gaganyaan mission.

Khyati Singh
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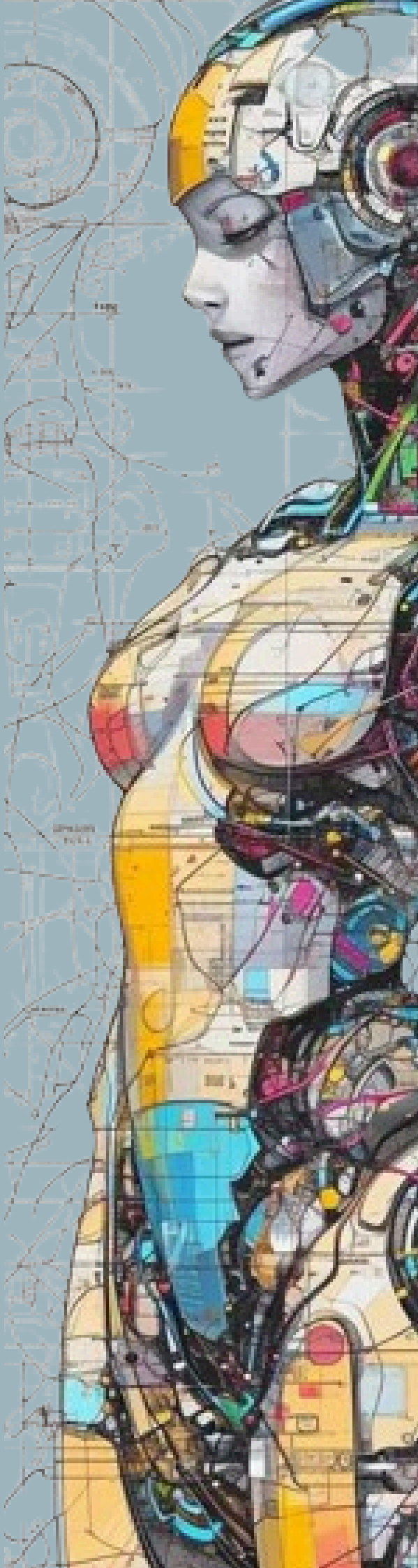
IX-D



The Intersection between Art and Technology

The boundaries between technology and traditional artistic expression are becoming less clear as a result of the merging of computer science and art, which is promoting a new creative age. This junction is a revolutionary force that is rewriting the rules of what art may be and how it is made.

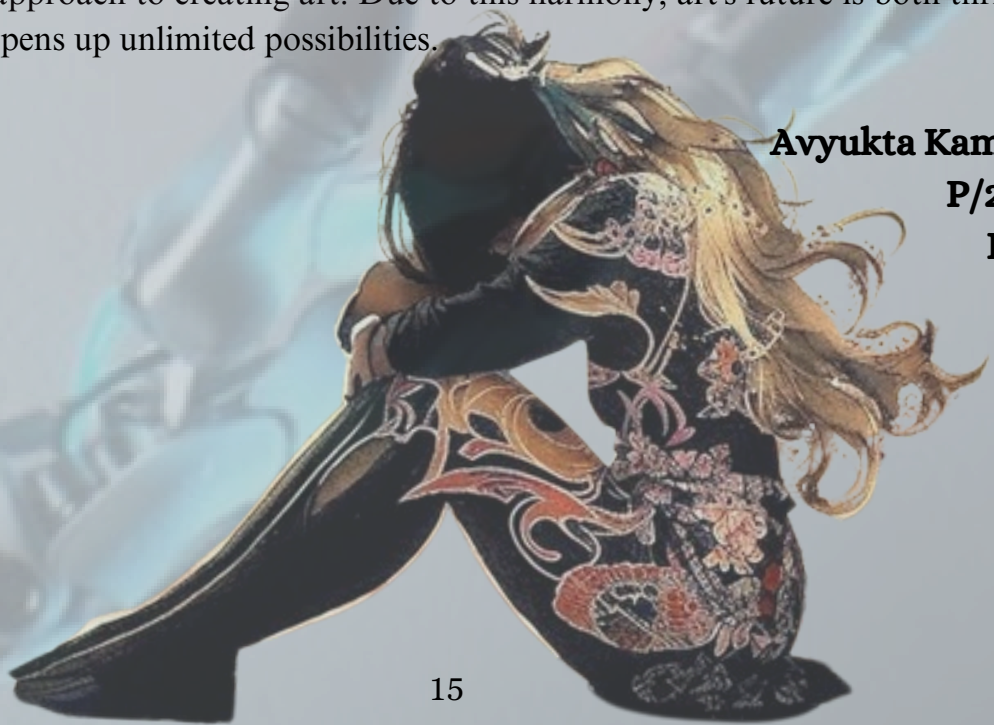
Data structures and algorithms are tools that computer science provides artists with new ways to create and express themselves. One well-known example is digital art, where artists use tools like Adobe Photoshop or Corel Painter to create pieces of art that can be just as delicate and detailed as traditional paintings. Computer-generated imagery (CGI), which lends fictitious locations and characters a level of realism never previously seen, has also completely changed the cinema industry. Two films that best demonstrate the storytelling potential of computer-generated graphics are Toy Story and Avatar.

Beyond the visual arts, music has been greatly impacted by computer science. Musicians can compose, edit, and produce their music entirely on a computer with programs like GarageBand and Ableton Live. The limits of music creation are being explored by algorithm composition, in which software creates music according to a specified set of principles. When human creativity and technological accuracy work together, amazing creations that were unthinkable before are produced.

This junction also stands out in the realm of Virtual Reality (VR) art experiences and interactive installations. Artists can engage audiences in ways that traditional art is incapable of by using technology and coding to create immersive settings. As the viewer is frequently required to actively participate in these encounters, the art is dynamic and always evolving.

In short, the combination of computer science and art represents a revolution in both our understanding of and approach to creating art. Due to this harmony, art's future is both thrilling and unpredictable. It opens up unlimited possibilities.

Avyukta Kamalia
P/2908
IX-C



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