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ENGINEERING & TECHNOLOGY**

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**INFORMATION
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2021 | 12th Edition



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From HOD's Desk



The Department of Information Technology Engineering has come up with another edition of its departmental magazine, "Login". It is good to see that today's generation has not lost its literary roots, despite the perpetual efforts of e-Technology to extinguish the flames of the written words. Innovation, orientation and an ever expanding base serve as a firm foundation for the latest development in the department of Information Technology Engineering. Login also gives an insight into the initiatives taken by the department to inculcate superior virtues in the students and encourage them to reach for the stars. The department endeavors to produce confident professionals tuned to real time working environment and aims to offer excellent academic environment with a team of highly qualified faculty members to inspire the students to develop their technical skills and inculcate the spirit of team work in them.

Reflecting upon all the activities taking place in the department, the face of the department has changed considerably whether it is the number of co-curricular activities to new course offerings, the environment continues to grow and evolve. I attribute this success to the winning combination of a dedicated faculty that works hard at imparting quality education, a well-planned syllabus and last but not the least, our students.

The strength of the department lies in the highly motivated students who understand the dynamics of the industry and hone their skills accordingly. The efforts my students have put into the successful creation of the magazine, under the mentorship of my learned faculty colleagues, is commendable. I hope you will enjoy reading about the exciting things that have been happening in the department.

Dr. Ashish Vanmali
Head of Department, Information Technology (VCET)

From Staff-Incharge's Desk



The department works with the objective of addressing critical challenges faced by the Industry, Society and the academia. Even more important is our unceasing commitment to our students, helping them to learn, grow, develop and achieve their goals in their pursuit to excel in their professional career

Magazine "Login" and Newsletter of our department facilitates our students and faculty members to publish their achievements and efforts. It provides a motivation to the students to see and follow the steps on the success path taken by their seniors. This also gives a reason to be proud of their classmates, seniors and faculty members.

The inhouse annual magazine reflects the success stories of our students and the faculty members. It is circulated to all students and faculty members containing information including placements, sport events, paper presentations, conferences etc. It also highlights the top-notch rankers in University and other competitive examinations, whereas the newsletter Rives insights of all the greatest accomplishments of the IT industries around the world.

Every day is a chance to begin again. Don't focus on the failures of yesterday, start today with positive thoughts and expectations. I wish and pray that our younger generations may always hold the lamp of love, peace, harmony and above all responsibility. You are here for reason, follow your passion, learn and change the world.

Prof. Bharati Gondhalekar
Staff-In Charge, I-TECH Committee.

From Chairperson Desk



"Technology requires knowledge and expertise more than it requires money" - Jonathan Raymond

I feel Jubilant to present to you the 12th edition of LOGIN, The Annual Technical Magazine of the Department of Information Technology, in which the I-TECH committee aspires to brief the

Students on how the technological advancements are changing society and what that means for the future. The I-TECH committee, through "LOGIN", attempts to provide the students with the latest advancements and researches in the field of Information Technology and also showcases how IT is fusing with many other industries giving rise to many astonishing developments. It also admires the co-curricular and extra-curricular achievements of the students.

I would like to extend my sincere gratitude to our honorable H.O.D., Dr. Ashish Vanmali, and our respectable staff-in-charge, Prof. Bharati Gondhalekar, for relentlessly guiding and encouraging the I-TECH committee, I would also like to thank the team members for their commitment and enthusiastic attempt in the making of this magazine.

The I-TECH committee will continue to enlighten the students with the latest technical extravaganza and surpass in the same with a better version of the magazine each year.

HAPPY READING!

Rahul Gandhi
Chairperson, I-TECH Committee

LOGIN

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Quantum Computing May Be Closer Than You Think

Five new quantum information science centers will marry the R&D strengths of academia, industry and U.S. national laboratories



Fully functional quantum computers and a new quantum industry may appear much sooner than many have anticipated—thanks to five new National Quantum Information Science Research centers just announced by the U.S. Department of Energy. This latest development in the recently launched National Quantum Initiative Act, signed into law in December 2018, comes with \$625 million in funding over five years.

It's a huge deal: for the first time, researchers from academia, U.S. national labs and industry will be working side by side aiming to speed up the fundamental quantum information science research. And more research should bring us closer to advanced quantum technologies

and the grandest goal of quantum information science, creating a fault-tolerant quantum computer that can indefinitely compute without errors.

Why do we need quantum computers? We need them to speed up the process of scientific discovery so that we can address some of our greatest global challenges, from designing new materials for more efficient carbon capture plants and batteries to better drugs and vaccines. Traditionally, material design has depended a lot on either happy accidents or a long and tedious iterative process of experimentation. Over the past half a century, classical computers have greatly accelerated this process by performing molecular simulations. Still, classical computers can't simulate complex molecules with enough accuracy, and that's where quantum computing will be able to help.

Quantum computers rely on the same physical rules as atoms to manipulate information. Just like traditional, classical, computers execute logical circuits to run software programs, quantum computers use the physics phenomena of superposition, entanglement and interference to execute quantum circuits. One day soon, they should be able to perform mathematical calculations out of the reach of the most advanced current and future classical supercomputers.

But to get there, we will need to build quantum machines that compute without errors. Quantum computers rely on fragile qubits, short for quantum bits, which are only of use when they are in a delicate quantum state. Any external disturbances or "noise," such as heat, light or vibrations, inevitably yanks these qubits out of their quantum state and turns them into regular bits.

Overcoming this hurdle is beyond the limits of a single team, and we need scores of scientists from academia, the national labs and industry to get us there. This is where the new centers come in. At last, they will get the talent from all our R&D sectors to work together on quantum-related issues.

Take the problem of building a quantum system that would compute without errors. Our best theories estimate that to get there, we should build machines with tens of millions of

qubits on a single cooled-down chip. But we don't want to cool down quantum chips the size of football fields. To avoid it, we need many breakthroughs—meaning we have to invest in research at scale. Luckily, some of the latest results show that it's possible to reduce the number of qubits we need to implement error-correcting codes.

But even if we achieve this, we will have to overcome another hurdle: linking quantum processors, just like we connect today's computer chips inside data centers using intranets. This requires quantum interconnects that transfer the fragile quantum information stored in the processor's qubits into a different quantum format (say, photons) that “communicate” the data to another processor. Advances in this space must unite disparate technologies like superconducting qubits and fiber optics, while solving outstanding challenges in materials science and quantum communications.

Research teams could probably solve these problems, and many other challenges the quantum information science community is tackling, individually. But it would take decades, and we can't afford to wait this long. Partnerships and collaboration, through the new centers, will offer us the chance of making the quantum leap we need. With a long-term vision of establishing a robust national quantum ecosystem, academia, national labs and industry partners at last have a quantum roadmap.

Now it's up to all the partners in this joint effort to create a quantum ecosystem and industry. We'll need plenty of the wit, talent, creativity and enthusiasm of a skilled and diverse quantum workforce to make it happen.

SMIT MASTER

BE-IT

Deepfakes: five ways in which they are brilliant business opportunities



A visitor to The Dalí Museum in St Petersburg, Florida presses a doorbell beside a dark life-sized screen. A darkened figure wearing a dapper suit and sporting a pencil moustache slowly leaves his easel and comes toward her into the light. It is, of course, Salvador Dalí, who looks at the visitor and speaks about his art and his museum. When the visitor is about to leave, he appears again. He asks if she would like a picture, then whips out his mobile phone and takes a selfie with her.

The fascinating thing about this encounter is that it's actually Dalí himself. How is it possible that the great Spanish surrealist can interact with members of the public years after his death, even using a phone that didn't exist when he was alive? Welcome to the world of deepfakes, an unsettling technology with a high potential to deceive – and also some unexpectedly positive uses.

Deepfakes are a powerful new technique to create realistic yet fake video or audio content. To breathe life into Dalí, the museum used deep learning to enable a computer to seamlessly exchange the face of a living actor who was dressing and behaving like Dalí with a digitally generated image of the artist's face and expressions.

This involves a “training process” in which advanced machine-learning algorithms sift through footage of Dalí and the actor to learn to generate new real-looking facial images of both men. It also learns to take an existing image of either man and generate an image of the other that perfectly matches the facial expressions and head posture of the first one. This makes it possible to generate Dalí faces that match the actor’s movements, which are then automatically inserted into the new video – creating an illusion of Dalí himself. There’s more detail here for those who are interested.

Opportunity knocks

To date, most producers of deepfakes have exploited the dark side of the technology. This has ranged from satire, such as this April Fool’s Day clip showing Mark Zuckerberg announcing he is deleting Facebook; to reputation-damaging footage of Hollywood stars supposedly starring in porn films; to fraud, such as mimicking a chief executive’s voice to request the transfer of a large sum of money.

The risks from deepfakes are undeniable. Yet the Dalí example illustrates that it is impossible to be black and white about this technology. In our research, we group deepfakes into five categories: voice swapping, text-to-speech, video face swapping, full-body puppetry and lip-synching. In each category, we see clear business opportunities. Some are still to materialize while others are being realized already.

1. Ventriloquism 2.0

Voice swapping can change a person’s voice or make it imitate someone else’s. It can be manipulated to sound younger or older, male or female, and with different dialects or accents. Possible uses include an audio-book narrator speaking in the voices of different characters, or using a famous person as a narrator without them having to go to the trouble of reading out the entire story. It also opens up fascinating possibilities for virtual assistants like Siri. Rather than needing to record voice actors with different accents and genders, audio voice swapping makes it possible to do this with just one voice.

2. Giving voices back

It has been possible for many years to make a computer speak by typing text into an application. Now the deepfake technology exists to do this with a particular person’s voice even where they haven’t previously recorded the words in question. This is becoming a life-changing technology for people who have lost the ability to speak intelligibly, such as those who have had strokes or have a progressive disease such as amyotrophic lateral sclerosis. Other possible uses

of this audio-text-to-speech technology include correcting misspoken words in a voiceover rather than having to get the person to record it again.

3. ‘Are you talking to me?’

As we saw with the Dalí example, video face swapping can replace the face of one person in a video with the face of someone else. This has great potential in the movies.

4. Game On

Video full-body puppetry can transpose movement from one person’s body to that of another. Possible uses include more immersive video games in which players can insert themselves into the action, with their own gait and movement characteristics; and movies where non-dancer actors can seemingly dance using footage of professional dancers.

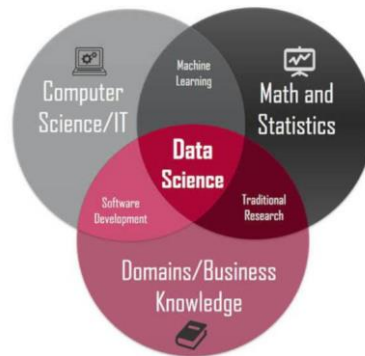
5. Subtitles RIP

Audio and video lip-synching can change mouth movements and spoken words in a video. It will soon be possible to make cost-effective, high-quality translations of movies, TV shows and other videos. A trained algorithm would imitate the original actor’s voice but in a different language, with the lip movement in sync with the new words. So while it’s clear that deepfakes can and are being used deleteriously, the same deep-learning technology is also opening up many innovative business applications. Many creative and productive possibilities are becoming apparent – and no doubt many others that people haven’t even spotted yet.

SHIVANI SHIRKE

TE - IT

Data Science Skills That Every Employee Needs



When data scientists look to others for improving their skills, they can get a better understanding of the company that exists around the data.

Analytics is about getting your team the data insights it needs to build better products and make the right decisions for your company. But if your team can't understand that data, then this is all for naught. Software like Amplitude can make your data easy to understand, but each member of your team still needs basic data skills to get the most value out of what they're looking at. These skills can help your team, regardless of whether that's in product or marketing or sales, interpret the data as it comes in. It also gives them the skills to work with your data scientists to propose new ideas for your product, as well as the confidence to work alongside them to improve the business. To do all of this, every employee should be able to...

1. Understand what correlation means - Correlations get a rough ride, but they are the backbone of data science. We always want to know how different variables change in relation to each other. For instance, your two variables might be the number of people completing your onboarding flow and the number of people retained after a month. If your onboarding flow is valuable and helps new users get to their 'a-ha' moment quickly, then you may guess that two numbers are *positively correlated*—when the first variable increases

2. Find the best sample size for your tests

Your hypothesis is that the font of your signup page footer is what is holding back your conversions. Your designer has chosen Roboto, whereas the latest growth hacks tell you Comic Sans is a conversion winner. You start your A/B test, and then nothing happens. Literally. It's not that you don't get good results, it's that you'll get no results. Your sample size will be too small.

3. Know why PPV matters

PPV, or **positive predictive value**, is a measure of the precision of your tests. It allows you and your team to know whether the behaviors you are measuring are predictive of the metrics you are interested in, such as retention.

You calculate PPV by taking the number of true positive samples in your experiment and dividing by the combined number of true and false positive samples.

$$\text{Positive Predictive Value} = \frac{\text{True Positives}}{\text{True Positives} + \text{False Positives}}$$

		Predicted condition			
		Predicted Condition positive	Predicted Condition negative	Prevalence = $\frac{\Sigma \text{Condition positive}}{\Sigma \text{Total population}}$	
True condition	condition positive	True positive	False Negative (Type II error)	True positive rate (TPR), Sensitivity, Recall, probability of detection $= \frac{\Sigma \text{ True positive}}{\Sigma \text{ Condition positive}}$	False negative rate (FNR), Miss rate $= \frac{\Sigma \text{ False negative}}{\Sigma \text{ Condition positive}}$
	condition negative	False Positive (Type I error)	True negative	False positive rate (FPR), Fall-out, probability of false alarm $= \frac{\Sigma \text{ False positive}}{\Sigma \text{ Condition negative}}$	True negative rate (TNR), Specificity (SPC) $= \frac{\Sigma \text{ True negative}}{\Sigma \text{ Condition negative}}$
		Positive predictive value (PPV), Precision $= \frac{\Sigma \text{ True positive}}{\Sigma \text{ Test outcome positive}}$	False omission rate (FOR) $= \frac{\Sigma \text{ False negative}}{\Sigma \text{ Test outcome negative}}$	Positive likelihood ratio (LR+) = $\frac{\text{TPR}}{\text{FPR}}$	Diagnostic odds ratio (DOR) $= \frac{\text{LR}^+}{\text{LR}^-}$
		False discovery rate (FDR) $= \frac{\Sigma \text{ False positive}}{\Sigma \text{ Test outcome positive}}$	Negative predictive value (NPV) $= \frac{\Sigma \text{ True negative}}{\Sigma \text{ Test outcome negative}}$	Negative likelihood ratio (LR-) = $\frac{\text{FNR}}{\text{TNR}}$	
		Accuracy (ACC) = $\frac{\Sigma \text{ True positive} + \Sigma \text{ True negative}}{\Sigma \text{ Total population}}$			

4. Think Like Bayes

Bayesian statistics differs from more orthodox “frequentist” statistics by treating the world as probabilistic. This means that instead of sharp decision boundaries (e.g. *this hypothesis is true/false*) you get *probabilities on whether your hypothesis is true or false* (e.g. *there is a 90% chance it’s true*).

Another fundamental difference is that Bayesian thinking allows you to use your knowledge of the world, called your *prior*, to build your initial model:

These probabilities can then be updated as more data comes in. This means that as you are running experiments, you can update your thinking depending on the evidence. **Bayes works like this:**

First, you take your hypothesis: *Changing the button on the signup page will increase signups.*

Then, you assign a probability to it being true, which is your prior: *Changing buttons on other pages has increased conversion rates, so I think changing this one will have an X% chance of success.*

Collect data and incorporate the implications of that data into your previous statement of the proposition's probability. This is your posterior.

Then, your posterior becomes your prior for the next iteration. Collect more data, repeat, and continue.

The best thing for non-data scientists about Bayesian thinking is that it's intuitive—you already do this. You have an idea of how something works in your head, and as new evidence comes in, you update your internal model.

5. Know the limitations of machine learning

Machine learning is a catch-all term for a number of different algorithmic and statistical methods. This is the cool tool *du jour*, with almost every new startup having some AI component. It even makes pretty pictures:

This image was created by the “dreams” of DeepMind, Google's machine learning tool. You don't have to understand the finer points of DeepMind, but it is a good idea to understand what machine learning is and what it is not, what it is capable of and what it is not. This can help you in two ways:

If you have an idea about some data, you'll be in a better position to know whether machine learning can help you understand that data better.

6. Clean Up Your Data

If there is just one item on this list that your data scientist would want you to learn, it would be this. You will instantly become their best friend if you present them with a clean dataset for their analysis. When you do, they can get to work faster, and you get answers faster. Learning to clean datasets makes everyone's life better.

7. Write SQL

SQL stands for Structured Query Language, and is the language of almost all databases. By speaking SQL, you are speaking the language of your data and your database. You will have all of your data at your fingertips.

8. Tell a good story

This is another data science skill that stands out as non-obvious. But if neither your data scientists nor you have this skill, then all the other skills are useless.

What's often forgotten about with data scientists is that they are not all robots (yet). Data science isn't all about the math. In fact, when it is, it's next to useless for the business as a whole. Data scientists need to build a convincing story with your data. This is why they are so indispensable. They need story-telling abilities to convince the audience of what the data shows.

SHRADDHA PAWAR

BE-IT

5 Ways AI is Changing our World for the Better

Man has long feared the rise of the machine – his own creation becoming smarter and more intelligent than he. But while artificial intelligence and machine learning are rapidly changing our world and powering the Fourth Industrial Revolution, humanity does not need to be afraid

Creating New Jobs

“Artificial intelligence will change the workforce,” affirms Carolyn Frantz, Microsoft’s Corporate Secretary. The bleak view of AI as a job killer is but one side of the coin: while 75 million jobs may disappear, as many as 133 million more engaging, less repetitive new roles are expected to be created. AI “is an opportunity for workers to focus on the parts of their jobs that may also be the most satisfying to them,” says Frantz.

Bridging Language Divides

Whether it’s teaching new languages in a personalized way or translating speech and text in real-time, AI-powered language tools from Duolingo to Skype are bridging social and cultural divides in our workplaces, classrooms and everyday lives. Digital translation services are not “perfect,” admits Microsoft education leader Mark Sparvell, but “they offer a means of understanding” that might not otherwise be possible.

Transforming Government

Less paperwork, quicker responses, a more efficient bureaucracy – AI has the power to drastically change public administration, but are governments ready? This tech comes with both risks and opportunities that need to be understood and evaluated. Academic Kevin Desouza believes gamification and role-playing could be the key to public servants analyzing complex cases, coming up with better solutions, and truly understanding the future of autonomous systems.

Delivering Health Care

AI has the potential to make health care “much more accessible and more affordable,” insists Paul Bates, director of NHS services at Babylon Health.

Babylon, an app that offers symptom checking and fast access to physicians if needed, is providing advice to more than one million residents in central London through an AI-powered chatbot. Patients can get an accurate, safe, and convenient answer in seconds – and save health care providers’ money too.

Creating Art

Computational creativity is drastically changing the nature of art. Software, more than a tool, is becoming a creative collaborator, merging computer scientist with artist. As Austrian artist Sonja Bäumel assures, “The exhibition space becomes a lab; art becomes an expression of science, and the artist is the researcher.”

RAHUL GANDHI
BE-IT

How AR Augments Modern Marketing Beyond the “Wow”

Tara is a democratic shopper. When she went shopping last December, she did not stop trying on a few pieces she liked. She encouraged her friends who had accompanied her to vote for each piece to help her buy what most preferred.



She did the same when she shopped last week. Staying safe at home, she simply logged in, picked what she liked, tried those on virtually and shared the images socially for a poll. Then and only then did she place the order online.

At the other end of Tara’s transactions are shops that had the option of forgoing business until the lockdown lifted and fears dissipated. However, business can’t wait. They took to augmented reality (AR) and bypassed the in-person sales roadblock altogether. In the process, they discovered a route that can supplement (and even boost) the traffic the main road is likely to deliver as and when it opens.

In play even before the virus did not spawn AR. It was in play long before, thanks to the many practical advantages it offered and still does.

Let us begin with Tara’s favorite shops. They do not have to maintain changing rooms. Nor do they need a large physical inventory and a fleet of employees to gather and rearrange items tried and discarded by customers. They now maintain a digital catalogue and are finding it faster and easier to adapt their sales strategy to the online, social market.



One of the early uses of AR was to bring static elements to life. Point your camera at the magazine ad and your phone will start playing a short film that would tell you more about the brand. Focus on the movie poster and the dinosaurs of Jurassic Park will lunge at you.

Taking it further, Hyundai created an augmented manual for drivers. When you “Ask Mercedes” something about your car, the augmented interface will tap the power of AI and give you a quick answer.

How can the tedious experience of waiting for a bus make you reach for a Pepsi? Because Pepsi had converted the walls of the bus stop using AR to depict captivating movie-like visuals. You might miss your bus, but you are unlikely to miss telling your friends about the wall that Pepsi brought to life.

Adding value to B2B marketing

AR may provide an engaging experience in consumer marketing, but it has great utility even in the B2B domain.

Imagine you are selling a complex product to a demanding client. AR can help your customers see and interact with the product, just the way they want—from drone’s viewpoint to up close and even through (cross-section). When you leave nothing to the imagination in a room full of decision makers, it becomes a lot easier for you to close the deal, without flying them all the way to your factory.

Does your customer want a say in the very design of the product or its customization? AR makes it easy for all to see the what-if scenario, making it possible to visualize the advantages

and the otherwise unanticipated problems. That helps you make productive use of WYSIWYG (what you see is what you get).

As seasoned marketers know, customer loyalty is won or lost more after the sales than during. When the customer has no time to flip through the pages or scroll infinitely in search of the solution they seek, AR can provide a show-and-tell solution that is more likely to ensure a repeat order than a fat discount.

“Camera marketing” must be thought through

In a pre-corona report published in April 2018, the *Boston Consulting Group* (BCG) noted that “one specific form of camera marketing, the use of augmented reality (AR), is quickly gaining traction.”

It observed that AR application consumers “are a particularly attractive segment for advertisers: most are millennials (aged 19 to 34) or Generation Z consumers (aged 18 or younger).

They use their smartphones and cameras continually throughout the day, communicating via images and video as much as they do through text and voice. This behavior opens up an entirely new method for engaging with consumers—an interactive approach where the advertiser is a participant in the ‘conversation’ or activity rather than a company delivering a message.”

PARSHVA VORA

RISHIKESH DESHMUKH

BE-IT

NFTs: What Are They, And How Do They Work?

The NFT market is growing at an exponential rate. But what exactly is an NFT? Here we take a closer look at one of the investing world's emerging fancies.



The market for NFTs, or non-fungible tokens, is rising fast.

Research firms L'Atelier BNP Paribas and NonFungible.com found that NFTs were a \$250 million market in 2020, with investments up 299% year-over-year.

And in March, the cryptocurrency blockchain marketplaces on which you can buy and sell NFTs grew exponentially to \$1 billion in sales, according to CryptoSlam, a non-fungible token collectibles data aggregator that counts Mark Cuban as an investor.

Investors are curious about NFTs and want to see for themselves what they are all about. As a result, NFTs have become an exceedingly popular blockchain technology and are growing in popularity.

In April, CNN reported Brady will serve as co-chair on the new NFT platform, Autograph, which will sell digital sports media, including NFTs from the seven-time Super Bowl champion himself.

The Tampa Bay Buccaneers quarterback is just the latest in a growing number of high-profile celebrities, including Tesla (TSLA) and SpaceX CEO Elon Musk and pop singer and songwriter Boy George, to get in on the NFT craze.

But what is an NFT exactly, and what does it do? Read on as we help get you up to speed.

What Is an NFT?

Non-fungible tokens are unique, identifiable digital assets whose exchange between the creator and the buyer, via the financial transaction of a cryptocurrency such as ethereum, is logged for anyone to view.

NFTs aren't just the asset itself – the GIF, JPG, MP3, etc. – but also a digital certificate of authenticity for an increasing number of collectibles ranging from art and music to trading cards.

"NFTs are a signature or an autograph ... and what you're buying is the authenticity of the assets," says Dave Nadig, Director of Research at ETF Trends.

When you buy an NFT, you are buying a verifiable digital token that represents your ownership of the asset on that blockchain. Almost any digital image can be bought and used as an NFT.

The "non-fungible" part of the name means they are not mutually interchangeable and cannot be replaced or exchanged with one another. No two NFTs are alike. That sets them apart from fungible “tokens” such as cryptocurrency (and even traditional currency) that can be exchanged for one another.

How Do NFTs Work?

The majority of NFTs reside on the Ethereum cryptocurrency’s blockchain. Similar to Bitcoin, Ethereum's blockchain creates permanent digital records of all transactions using that cryptocurrency. And it also creates an irrefutable ledger of NFT transactions.

The creator of the NFT retains the copyright for it, as well as the right to duplicate it as many times as they want. The creator may produce multiple copies of the original – and if the buyer of the NFT wants to make copies, they need to get permission from the creator – and each is considered a unique NFT.

Similar to physical collectibles, replications will not be as valuable as the original, and supply and demand will impact how much the NFT is worth.

And in some cases, the creator will receive royalties each time an NFT is sold, though there is currently not a universal system in place. For instance, holders of EulerBeats Originals – an NFT audio-visual platform – get a set 8% of the print price of each copy sold of their original token.

On digital asset marketplace Rarible, meanwhile, creators can determine how much in royalties they will receive each time their NFT is copied and sold on the secondary market.

Can NFTs Be Taxed?

NFTs are considered "collectibles." And collectibles – which can include art, cards and rare items – are labeled alternative investments by the IRS.

If sold at a gain, NFTs are subject to the long-term capital gains tax rate for collectibles, which is 28%. The Taxpayer Relief Act of 1997 lowered the maximum capital gains rate on proceeds from the sale of most assets to 20%, but left the maximum rate of 28% on gains from the sale of collectibles.

What Are NFTs Worth?

Some investment analysts believe a signed NFT that holds a patent, copyright or is unique can generate value as an investment tool.

"In my mind, these are psychological assets like any other collectible," says Nadig. "These are collectibles, and the value is determined by what someone is willing to pay."

NFTs themselves have no value, but instead assign value to an underlying asset. So whatever the underlying asset that the NFT validates can change in value with changes in consumer's tastes, says Kim Caughey Forrest, Chief Investment Officer of Bokeh Capital Partners.

And while you can buy some NFTs for as cheap as a buck, the ceiling for NFTs' value is quite high.

In March, for instance, digital artist Beeple sold an NFT through Christie's for \$69.3 million including fees – a record for a digital-only piece of artwork. A handful of other NFTs have sold for seven digits.

SAMRUDDHI GAMRE

VANASHREE GAIKWAD

TE-IT

Impact of Apple ad tracking changes will hinge on app developers, exec says

Apple's changes only come into effect when app developers either sell data to third-parties for targeting ads, or buy third-party data to mix with their own to target ads.

Apple's iOS 14.5 update released with better privacy controls .The impact of Apple Inc's new privacy controls over digital advertising tracking is likely to depend greatly on how app developers implement a new pop-up notification, Apple's user privacy chief told Reuters.

Apple on Monday started enforcing a rule introduced last year requiring developers to use a pop-up notification seeking permission to gather data that can be used to track users across third-party sites and apps.

Facebook Inc has said the rules could harm its customers. Some mobile advertising analysts believe fewer than one in three users will opt-in, which could diminish the effectiveness and profitability of ad targeting.

Erik Neuenschwander, Apple's user privacy chief, said in an interview that opt-in rates are likely to hinge on how developers make their case to users before showing the prompt, and the language used in a space Apple reserves for developers to give a reason for seeking permission.

In past years when Apple introduced new permission pop-ups for items like microphone access, the rates varied with whether users perceived value in granting permission, he said.

"A lot of it is based on the case that the developer makes," Neuenschwander said. "What we have found through all the other permissions that have been coming into iOS over the years, is that (communication) is the major contribution the developer can make to making sure the user gets an informed choice."

Developers do not have to use the pop-up to show ads based on first-party data, such as what news stories a user has read in an app.

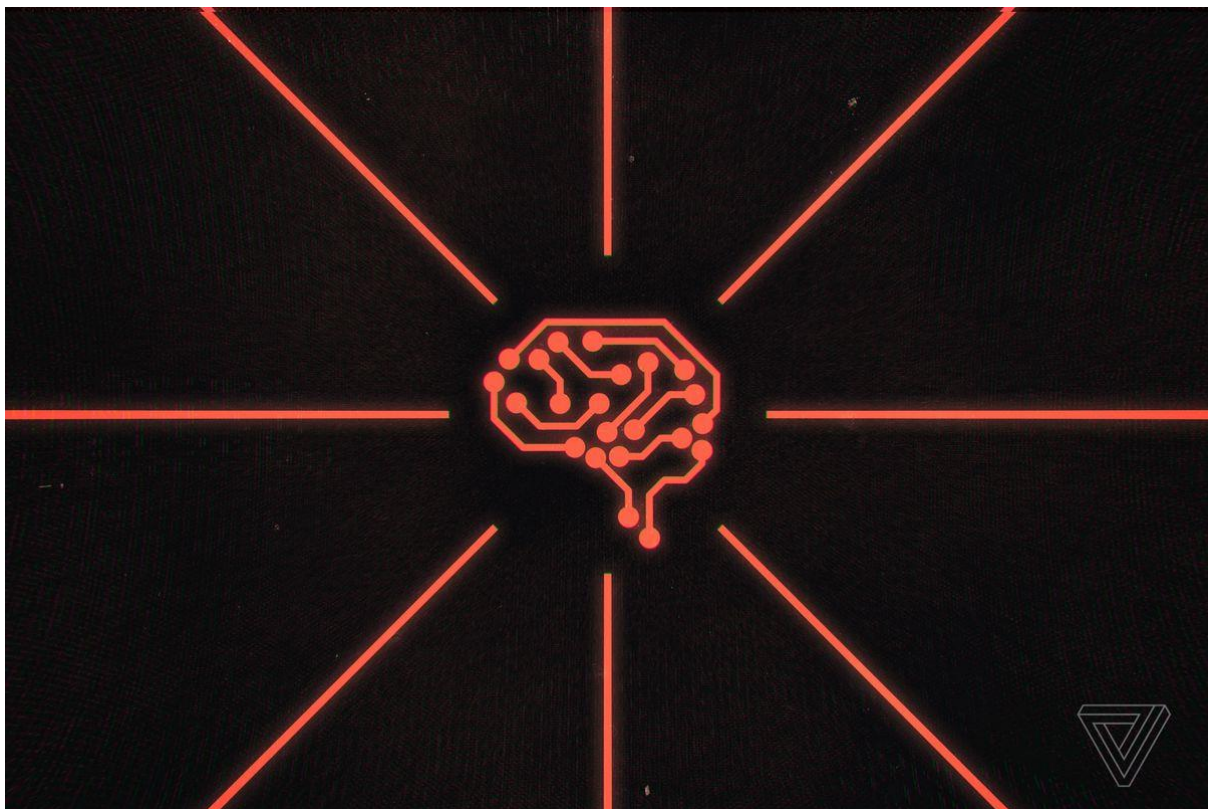
"We're in favour of advertising - we do some advertising ourselves," Neuenschwander said.

"You won't see Apple prompt to track because we design our applications and our systems such that they don't track users," he added. "That's the approach that we're taking, but we still leave open the fact that others can take other approaches."

**GRANTHALI JADHAV
AAKANKSHA JADHAV
TE-IT**

The EU is considering a ban on AI for mass surveillance and social credit scores

Leaked regulation suggests strong new laws on AI uses



The European Union is considering banning the use of artificial intelligence for a number of purposes, including mass surveillance and social credit scores. This is according to a leaked proposal that is circulating online, first reported by *Politico*, ahead of an official announcement expected next week.

If the draft proposal is adopted, it would see the EU take a strong stance on certain applications of AI, setting it apart from the US and China. Some use cases would be policed in a manner similar to the EU's regulation of digital privacy under GDPR legislation.

GDPR, but for artificial intelligence

Member states, for example, would be required to set up assessment boards to test and validate high-risk AI systems. And companies that develop or sell prohibited AI software in the EU — including those based elsewhere in the world — could be fined up to 4 percent of their global revenue.

According to a copy of the draft regulations include:

- A ban on AI for “indiscriminate surveillance,” including systems that directly track individuals in physical environments or aggregate data from other sources
- A ban on AI systems that create social credit scores, which means judging someone’s trustworthiness based on social behavior or predicted personality traits
- Special authorization for using “remote biometric identification systems” like facial recognition in public spaces
- Notifications required when people are interacting with an AI system, unless this is “obvious from the circumstances and the context of use”
- New oversight for “high-risk” AI systems, including those that pose a direct threat to safety, like self-driving cars, and those that have a high chance of affecting someone’s livelihood, like those used for job hiring, judiciary decisions, and credit scoring
- Assessment for high-risk systems before they’re put into service, including making sure these systems are explicable to human overseers and that they’re trained on “high quality” datasets tested for bias
- The creation of a “European Artificial Intelligence Board,” consisting of representatives from every nation-state, to help the commission decide which AI systems count as “high-risk” and to recommend changes to prohibitions

Perhaps the most important section of the document is Article 4, which prohibits certain uses of AI, including mass surveillance and social credit scores. Reactions to the draft from digital rights groups and policy experts, though, say this section needs to be improved.

“The descriptions of AI systems to be prohibited are vague, and full of language that is unclear and would create serious room for loopholes,” Daniel Leufer, Europe policy analyst at Access Now, told *The Verge*. That section, he says, is “far from ideal.”

Leufer notes that a prohibition on systems that cause people to “behave, form an opinion or take a decision to their detriment” is unhelpfully vague. How exactly would national laws decide if a decision was to someone’s detriment or not? On the other hand, says Leufer, the prohibition against AI for mass surveillance is “far too lenient.” He adds that the prohibition on AI social credit systems based on “trustworthiness” is also defined too narrowly. Social credit systems don’t have to assess whether someone is trustworthy to decide things like their eligibility for welfare benefits.

On Twitter, Omer Tene, vice president of nonprofit IAPP (The International Association of Privacy Professionals), commented that the regulation “represents the typical Brussels approach to new tech and innovation. When in doubt, regulate.” If the proposals are passed, said Tene, it will create a “vast regulatory ecosystem,” which would draw in not only the

creators of AI systems, but also importers, distributors, and users, and create a number of regulatory boards, both national and EU-wide.

This ecosystem, though, wouldn't primarily be about restraining "big tech," says Michael Veale, a lecturer in digital rights and regulations at University College London. "In its sights are primarily the lesser known vendors of business and decision tools, whose work often slips without scrutiny by either regulators or their own clients," Veale tells *The Verge*. "Few tears will be lost over laws ensuring that the few AI companies that sell safety-critical systems or systems for hiring, firing, education and policing do so to high standards. Perhaps more interestingly, this regime would regulate buyers of these tools, for example to ensure there is sufficiently authoritative human oversight."

It's not known what changes might have been made to this draft proposal as EU policymakers prepare for the official announcement on April 21st. Once the regulation has been proposed, though, it will be subject to changes following feedback from MEPs and will have to be implemented separately in each nation-state.

TEJAL ILLE

TE-IT

Will Popularity Spell Doom for Bitcoin?

Cryptocurrencies, from Ethereum to Bitcoin to Dogecoin, seem to be all the rage these days. Altcoins (i.e., lesser-known cryptocurrencies) have become increasingly mainstream. The increasing fracturing and pluralism in the cryptocurrency space has meant that few people are directly trading with any particular currency. Most users go through trading and wallet platforms where the platform—not their own computers—hosts the cryptocurrency. Additionally, transactions are increasingly processed via third parties as well, not directly on the cryptocurrency platform.



This separation between the user and the direct cryptocurrency platform has enabled a new option: a payment gateway for a website that collects payments in a number of different cryptocurrencies using a single set of tools. PayPal, one of the top gateways, recently launched a multi-cryptocurrency extension to their payment/payment gateway service. Following that, NOWPayments announced a Shopify plugin that allows participating merchants to accept payment using 70 different cryptocurrencies.

More people joining the bandwagon sounds like good news for cryptos, right? However, what few people seem to realize is that the explosion of cryptocurrencies, combined with a unified

payment channel, undermines one of their core value propositions: preventing bankers and governments from inflating the currency.

This is an especially significant problem for Bitcoin. It was established with a hard cap of about 21 million bitcoins. The reason was straightforward. Governments and banks have a habit of devaluing their currencies by simply creating more money. This is, ultimately, one of the problems of “fiat” currency that Bitcoin was created to solve. If the system physically prevents anyone from adding money, then governments and banks can’t artificially inflate the currency. Many lesser known cryptos follow the same policy.

However, because the new generation of payment gateways allows users to purchase with any of a number of different cryptocurrencies, the governments and banks can now easily inflate. Instead of printing more Bitcoin, they will just start new cryptocurrencies. Each individual currency can advertise that it is “limited” and “inflation-proof” if it has a hard cap. But the ability to transact in any of them means that it is now easier than ever to print money.

With government-managed fiat currencies, the money supply can only be expanded through elected officials or their appointees. But crypto money supply can be expanded at the whim of anyone who has access to the payment gateways. All they need to do is allow another type of crypto and voilà! more money is printed.

So, ironically, the success of cryptocurrencies has actually undermined one of its core value propositions. Widespread acceptance greatly reduced the gap between fiat and crypto but it also makes cryptocurrencies more vulnerable to inflationary pressures than fiat. While both currencies can now be inflated easily, fiat is at least checked by government regulations and restrictions on who can inflate and under what circumstances. In the case of cryptocurrencies, any individual or group who can convince a payment processor to add a new crypto to gateway’s accepted list can now inflate the money supply.

HARDIK YEWALE

CHINMAY INGALE

TE-IT

3 Tech Trends Reshaping the Healthcare Industry

It might seem ironic that one of the greatest paradigm changes in the healthcare sector is being driven by one of the greatest health crises the world has ever seen, but it really isn't.

Healthcare has always been one of the most important sectors of society. Throughout history, people have explored a variety of means to prevent and cure disease and to achieve better health and longevity.

As computer-driven technology has become increasingly sophisticated and more widely available, it's not surprising that entrepreneurs are finding ways to bring the latest technologies to bear in solving health issues of all kinds. Those who are successful will reap immense benefits for themselves and society at large for the simple reason that good health is something individuals, communities, and nations are willing to pay a premium for. For investors, entrepreneurs and customers who want to stay informed, here are some of the technologies having the most impact on the healthcare sector.

3. Telehealth

At first glance, it might seem ironic that one of the greatest paradigm changes in the healthcare sector is being driven by one of the greatest health crises the world has ever seen, but it really isn't. That's what technology and tech entrepreneurs do — step in to provide solutions to problems. Although the concept of calling or teleconferencing with a doctor is not new, the recent movement restrictions have shifted the concept from being a novelty to a necessity.

Today, there are a variety of platforms that allow people to get on video calls with their doctor where the provider can conduct a comprehensive analysis of their symptoms, give a diagnosis and even prescribe drugs or procedures. Most hospitals have shifted to a hybrid care model which is increasingly popular for basic consultations, with in-person care reserved for follow-ups and urgent procedures. Using a hybrid system has been very effective. Several large organizations, including Harvard Medical School, have seen successful outcomes for patients while reducing costs drastically and making healthcare more accessible as a result.

2. AI & machine learning

Wearables have become more popular over the years and have provided lots of useful data for people to track their health. That data is a goldmine of information for healthcare providers as well. Providers can tap into the data to get a comprehensive view of a person's health over years, down to the day, hour and minute. By applying advanced algorithms to these data sets, medical professionals can make diagnoses that are both faster and more accurate.

AI is already being applied in various areas of healthcare, including vaccine development, simulation-driven drug discovery, thermal screening and diagnostics applications. The creation of advanced hardware to make self-care more convenient and effective, including products such as t-shirts with health sensors and Myst dental care devices which provide automated full-mouth toothbrushing, are great examples of AI at work. In addition to health technology, data-based and AI-driven prediction will also likely be used by more and more insurance companies to better identify risks and further optimize the plans they offer. Among other applications, machine learning has been applied to read x-rays and also to develop algorithms that help oncologists offer deep insights on biopsy reads.

3. Virtual reality

VR has traditionally been the realm of gamers, and most people instinctively associate the technology with gaming and entertainment generally. However, there are quite a few health applications, including healthcare for seniors, that use VR. Virtual reality can help seniors visit their favorite places and childhood neighborhoods and enjoy scenic locations. This serves as a form of memory care therapy and is very useful in boosting socialization and overall psychological health among seniors.

Virtual reality is also being used as a sort of tech anesthetic, helping to distract patients undergoing painful treatments in situations where using anesthetics wouldn't be ideal. It is also being used to provide education, by giving vivid tours of the human body (or even tumors) to explain procedures to patients and their families.

Another thing VR is increasingly used for is the planning process of complex surgeries. To ensure that the processes go smoothly, the staff involved in the surgery can use VR to explore visualizations of the patient's organs, thus helping them to prepare for potential obstacles, prevent loss of life and increase the chances of a successful operation.

JAINIL SHAH

AJAY SHAH

SE-IT

Intra College Achievements 20-21

Sr. No.	Participants	Year	Event	Achievements
1	Insha Mulla, Divya Sakre, Mrunmayi Patankar	SE	Mock The Voice	Winner
2	Reeya Shah , Swaraj Singh	BE	Dumbcharades	Winner
3	Harsh Sawant	FE	Solo Dance	Winner
4	Mayank Mahajan	FE	eSports (csgo)	Runner up
5	Omkar Jadhav	FE	Master Stroke	Runner up
6	Sweety Singh	TE	Extempore	Winner
7	Heemali Save	BE	Dialogue Writing	Runner up
8	Vanashree Gaikwad	TE	Independence day Speech competition	Winner

Inter College Achievements 20-21

Sr. No.	Participants	Year	Event	Achievements
1	Akanksha Singh	BE	Fastest Recitation of English Alphabet in Reverse Order (Z to A)	Winner
2	Sahil Patil	SE	Kalakriti Short film Making Competition organised at Firande 5.0 by Symbiosis Institute of Business Management, Hyderabad.	Winner
3	Rahul Gandhi , Sachin Kunder , Smit Master	BE	15th Inter-Collegiate / Institute / Department Avishkar Research Convention:2020-21	Participated
4	Devdooth Maji , Ravi Lamkoti , Hitesh Shetty	BE	16th Inter-Collegiate / Institute / Department Avishkar Research Convention:2020-21	Participated
5	Vivek Singh	BE	ASEAN India Hackathon	Second Position
6	Deepak Kharah, Dhruv Parekh, Kirtesh Suthar, Nitu Sharma, Pawan Sharma, Ravi Lamkoti, Vivek Singh	BE	Smart India Hackathon 2020	Winner
7	Insha Mulla	SE	4th National Engineering Olympiad	Participated

Placement Records 20-21

Sr. No.	Name of the student placed	Name of the Employer
1	Nayak Aarti	Infosys
		LTI
		TCS
2	Mahajan Abhinav	Evolutionary Systems Pvt Ltd
		Infosys
		TCS
3	Parikh Aditya	Infosys
		Larsen & Toubro Infotech
		TCS
		Zeus Learning
4	Maji Devdoot	Zeus Systems Private Limited
5	Parekh Dhruv	Contentstack
6	Dipakkumar Gautam	Infosys
		TCS
7	Timbadia Harsh	Infosys
8	Shah Harshil	TCS
9	Save Heemali	TCS
10	Shetty Hitesh	TCS
		Infosys
11	Redkar Kasturi	TCS
12	Raikar Kaushik	TCS
		Zeus Learning
13	Suthar Kirtesh	GetVantage
14	Barke Nikhil	TCS
15	Jethwa Niraj	TCS
16	Vora Parshva	Infosys
17	Sharma pawan	Raw Engineering
		TCS
18	Lamkoti Ravi	Infosys

Placement Records 20-21

Sr. No.	Name of the student placed	Name of the Employer
19	Shah Reeya	Infosys
20	Shenoy Ritika	TCS
21	Deshmukh Rushikesh	Square yards
22	Kundar Sachin	TCS
23	Sayed Saima	Raw Engineering
		TCS
24	Bandgar Saloni	Infosys
		TCS
25	Shetye Shardul	TCS
		Zeus Learning
26	Jaiswal Shivam	TCS
27	Sawant Shweta	Contentstack
28	Anekar Sonam	Evolutionary Systems Pvt. Ltd.
29	Singh Swaraaj	Infosys
		TCS
30	Singh Vivek	TCS
31	Dalvi Yash	TCS
32	Shinde Kalpesh	Infosys

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