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Department Of

INFORMATION TECHNOLOGY

2019 | 10TH Edition

VIDYAVARDHINI'S COLLEGE OF ENGINEERING & TECHNOLOGY

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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-In Charge'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 in house 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 gives 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's Desk

"An investment in knowledge pays the best interest." - Benjamin Franklin

It gives me a great pleasure to bring the 10th edition of Information Technology Department's technical magazine "LOGIN 2019". I take this opportunity to thank and congratulate all members of I-TECH for making a spirited attempt towards I-TECH LOGIN 2019. "Its not enough to be up to date, you have to be up to tomorrow". Thus I-Tech not only keeps the student updated with the recent technological advancement but also enlightens them with the future innovations and researches that can be conducted. Along with the technical activities it also praises the academic and extra-curricular achievements of students. However, our main goal is to keep the students updated with the latest enthralling technological advancement and researches.

I would like to extend my thanks to our respectable H.O.D Dr Ashish Vanmali and our staff in charge Prof. Bharati Gondhalekar who guided, supported and encouraged the I-TECH team throughout the journey. We are also thankful to all the teaching and non-teaching staff of IT Department for their constant support and guidance.

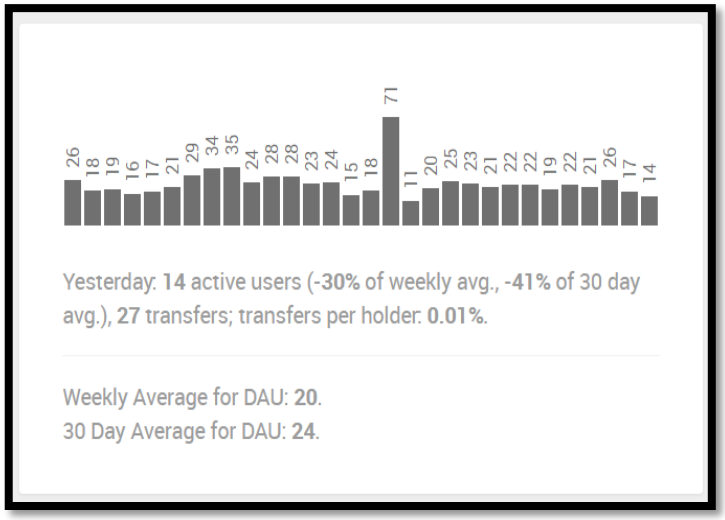
We plan to outdo our expectations each year by publishing better versions of annual technical magazine and newsletter. This increases the student participations and inculcates their interest in coding. With the productive association of staff and students we assure to remit a better and an enlightening magazine and e-magazine and carry forward the vision.

Prathamesh Karambe
Chairperson,
I-TECH Committee

LOGIN

Blockchain & Advertising - New Solutions to Old Problems

How many online advertisements you have been subjected to since you started browsing the internet? Hundreds of thousands? Millions?



Wherever you go online, you leave behind a digital footprint, with data from website visits, searches, cookies, and your browser being accumulated in an attempt to figure out which ads you're going to be most interested in seeing. The giants of the internet are all in on this game—Google, Facebook, Amazon, etc.—and then there are layer upon layer of subsidiaries who collect, harvest and distribute this data among themselves. It's an opaque and sometimes predatory infrastructure that provides the end user very little value but takes a surprising amount. For publishers as well, the current system leaves a lot to be desired, with Google and Facebook taking 99 percent of growth and 73 percent of ad dollars. Ad revenue has recently decreased 66 percent and bots caused $7.2 billion in fraud in 2017! Finally, advertisers lose out a due to lack of information.

Sometimes you can be fooled by fake websites that commit fraud. Thankfully, however, various entrepreneurs have begun to think about how to renegotiate the relationship between the advertising industry and the consumers it serves. Leading the charge are various blockchain solutions that leverage an immutable, distributed and transparent ledger to provide previously unforeseen benefits for consumers as well as ad-tech companies themselves.

Making contracts faster and smarter and speeding up payments, reducing ad fraud by creating an immutable audit trail between brands and consumers, augmenting or replacing digital advertising infrastructure, allowing publishers and advertisers to buy and sell ads directly, exposing or eliminating middlemen who benefit from programmatic ad deals transforming how attention is valued online (i.e. rewarding brand interactions, allowing surfers greater control over their data and the ability to sell their data to advertisers, empowering consumers to play a more active role in the digital ads ecosystem) .The current MVP in the blockchain-based advertising sector is basic attention token. BAT is the native token of brave, an ad-blocking web browser, which anonymously monitors user attention, then rewards publishers accordingly with BATs. Recently Brave has also started trials to reward viewers for watching ads, which will be shown directly in the browser in a private channel to users who consent to see them. When the ad system becomes widely available, users will receive 70% of the gross ad revenue. What's inspiring about the Brave browser is its noble aim to deliver privacy as you browse, and also speed load times. It blocks trackers and ads that learn about you without your consent, which at first glance would seem set up to punish the advertising industry. It also makes it very easy to select which sites you reward with micropayments. The browser identifies where users spend the most time and then uses this information to calculate the proportional reward for each publisher using BAT. This project deserves to be taken seriously on the credentials of its team alone, which has been assembled by JavaScript inventor and Mozilla co-founder Brendan Eich. Moreover, the Brave browser has been downloaded 5 million times on Google Play store, has 2.3 million monthly active users across all versions, and 14,000 verified publishers who have signed up to receive BAT payments. The network statistics for BAT are also quite impressive. It is currently sitting on a market-cap of $217 million, making it the 14th most valuable ERC20.

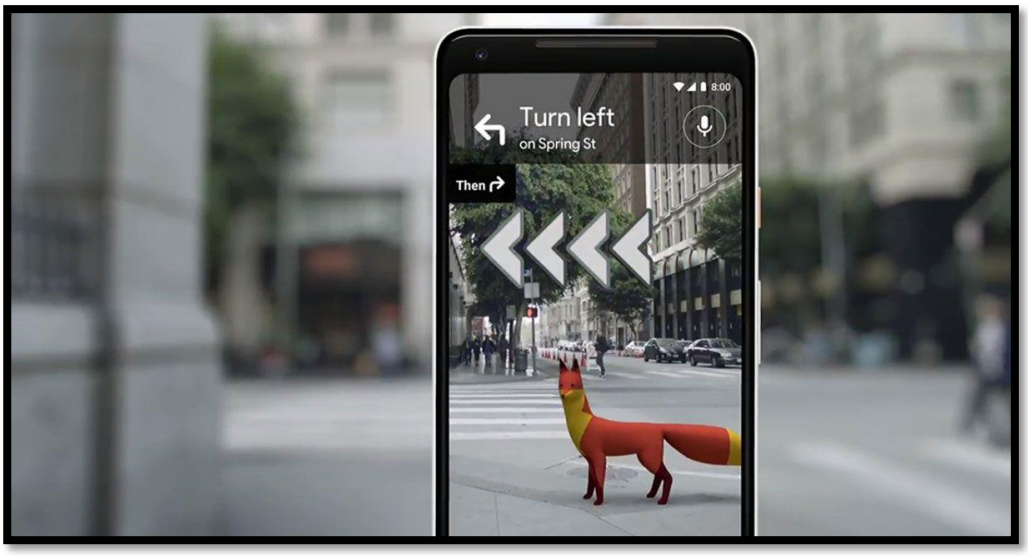
KINJAL PATEL

TE IT

Google Is Rolling Out AR Navigation for Its Maps App

Google Maps is finally getting a previously teased augmented reality upgrade.

In May 2018, Google announced plans to add an AR navigation feature to its Maps app. Nine months later, the feature is now rolling out to a select group of Google users — giving the world its first glimpse at the likely future of getting around. In the recent Wall Street Journal published a story detailing reporter David Pierce's experience testing out an early version of Maps' AR feature.



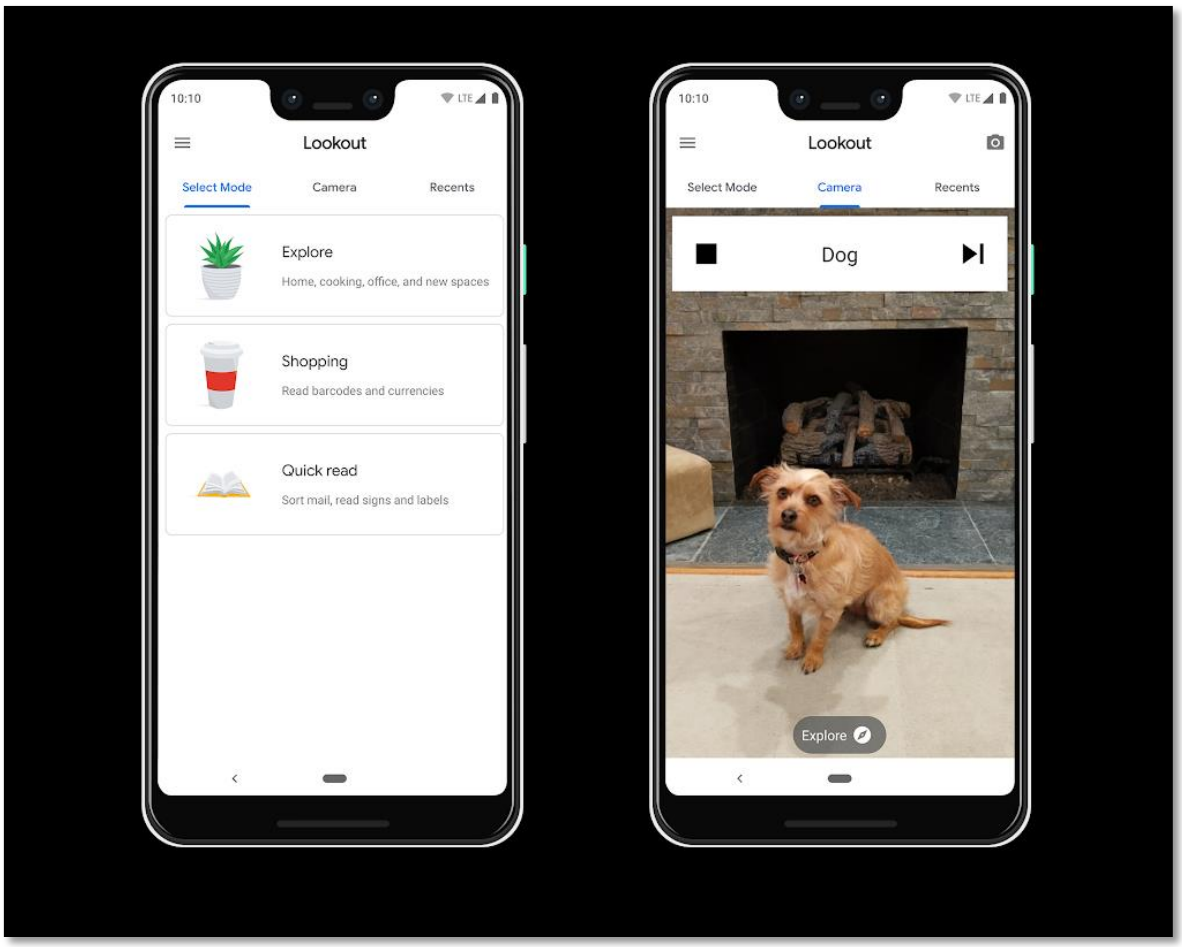
In it, he notes how the feature added a layer of graphics over the "real world" as viewed through the camera in his smartphone. These graphics ranged from large arrows pointing in the direction Pierce needed to walk to text that appeared to hover over the sidewalk, letting him know how many steps he needed to take until his next turn. "It was as if Maps had drawn my directions onto the real world," he wrote, "though nobody else could see them." According to Pierce, Google only plans to make the current version of the AR navigation feature available to "a few Local Guides, who are the service's most dedicated reviewers and users." The rest of the world won't have access to the feature until Google is satisfied with it, and there's no telling when that might be. Still, it appears Google is committed to making AR a part of its future.

MOHIT MATHKAR

TE IT

With Lookout, discover your surroundings with the help of AI

Whether it's helping to detect cancer cells or drive our cars, artificial intelligence is playing an increasingly larger role in our lives. With Lookout, our goal is to use AI to provide more independence to the nearly 253 million people in the world who are blind.



Lookout helps those who are blind or have low vision identify information about their surroundings. It draws upon similar underlying technology as Google Lens, which lets you search and take action on the objects around you, simply by pointing your phone. Since Google announced Lookout at its I/O last year, it has been working on testing and improving the quality of the app's results.

Google designed Lookout to work in situations where people might typically have to ask for help—like learning about a new space for the first time, reading text and documents, and completing daily routines such as cooking, cleaning and shopping. By holding or wearing your device, Lookout tells you about people, text, objects and much more as you move through a space. Once you've opened the Lookout app, all you have to do is keep your phone pointed forward. You won't have to tap through any further buttons within the app, so you can focus on what you're doing in the moment. Screenshot image of Lookout's modes including, "Explore," "Shopping," "Quick read" Second screenshot of Lookout detecting a dog in the camera frame. As with any new technology, Lookout will not always be 100 percent perfect. Lookout detects items in the scene and takes a best guess at what they are, reporting this to you.

KRITHIKA SUVARNA

TE IT

How PWAs Propel The Web To A New Level

Progressive Web Applications (PWAs) are one of the most talked about technologies shifts in the web and has gained unparalleled momentum among the practitioners in the world.

These are basically web apps that load like regular web pages or websites but can offer the user functionality such as working offline, push notifications, and device hardware access traditionally available only to native applications. They combine the flexibility of the web with the experience of a native application.

Dominic Siacci, CTO at Good Barber has shared his experience as to how switching onto native apps proved an advantage to them. He further states when they started creating native apps in 2009, they were convinced to an extent. PWA's have been growing tremendously over the recent years. At the time of their launch, no one could have predicted that 10 years later they would make up 90% of internet time on smartphones.

There has been a lot of spotlight on building PWA and its advantages. Here are some of them:

1. Incomparable user experience

2. Fluidity and speed

3. Integration with a mobile operating system

4. Viability with independence to connectivity

5. Highly Dynamic

The web still exists thanks to its high-traffic potential ,to be specific there's been a large amount of audiences that use smartphones also mobile web and as compared to them the apps are few and a growth dynamic that's superior to native apps.

To summarize the advantages of the web:

• No download is required, so users don't need to worry about space on their device.

• The possibility to integrate links, making traffic sources numerous while apps only receive direct traffic.

• Lower costs in development, maintenance and acquisition (an average app install ranges from $1 to $3, while cost per click on web ranges from 30 cents to 50 cents).

So PWA in a nutshell can be given as:

- Reliable
- Fast
- Engaging

Native apps have conquered users' hearts but still haven't managed to reach the same scope as the web. Progressive web apps are the perfect combination of native app advantages merged with the most successful elements of mobile web. They are revolutionizing the mobile universe by allowing users to access the fundamental characteristics of native apps and therefore reach a

level of user experience never obtained before. Mainly supported by Google, PWAs are formalized by a checklist that regroups all the criteria they must meet in order to deliver a user experience similar to the one provided by native apps. Like native apps, PWAs allow the web experience to be more reliable, fast and integrated. PWAs are independent of connectivity thanks to their most emblematic tech element: the service worker.

So what's the conclusion?

Are PWAs the future of the apps? It's hard to say, even though all the elements point to it. But we can certainly state that PWAs are the future of the web. Even if it is still a new concept, one that's not yet adopted universally by all browsers, everyone seems to open their doors to PWAs. As an instance Apple has opened Safari to service workers with iOS 11.3, and Microsoft already took the plunge by indexing PWAs in the Microsoft Store. So the conclusion is now that PWA's have the potential to create a shift in the way the web works

RAJ KOTADIA

TE IT

Peering into neural networks

CAMBRIDGE, Mass. — Neural networks, which learn to perform computational tasks by analyzing large sets of training data, are responsible for today's best-performing artificial intelligence systems, from speech recognition systems, to automatic translators, to self-driving cars. But neural nets are black boxes. Once they've been trained, even their designers rarely have any idea what they're doing — what data elements they're processing and how. Two years ago, a team of computer-vision researchers from MIT's Computer Science and Artificial Intelligence Laboratory (CSAIL) described a method for peering into the black box of a neural net trained to identify visual scenes. The method provided some interesting insights, but it required data to be sent to human reviewers recruited through Amazon's Mechanical Turk crowdsourcing service.

At this year's Computer Vision and Pattern Recognition conference, CSAIL researchers will present a fully automated version of the same system. Where the previous paper reported the analysis of one type of neural network trained to perform one task, the new paper reports the analysis of four types of neural networks trained to perform more than 20 tasks, including

recognizing scenes and objects, colorizing grey images, and solving puzzles. Some of the new networks are so large that analyzing any one of them would have been cost-prohibitive under the old method. Neural networks are so called because they loosely resemble the human nervous system, with large numbers of fairly simple but densely connected information-processing "nodes." Like neurons, a neural net's nodes receive information signals from their neighbors and then either "fire" — emitting their own signals — or don't. And as with neurons, the strength of a node's firing response can vary.

The researchers also knew which pixels of which images corresponded to a given network node's strongest responses. Today's neural nets are organized into layers. Data are fed into the lowest layer, which processes them and passes them to the next layer, and so on. With visual data, the input images are broken into small chunks, and each chunk is fed to a separate input node. For every strong response from a high-level node in one of their networks, the researchers could trace back the firing patterns that led to it, and thus identify the specific image pixels it was responding to. Because their system could frequently identify labels that corresponded to the precise pixel clusters that provoked a strong response from a given node, it could characterize the node's behavior with great specificity. The researchers organized the visual concepts in their database into a hierarchy. Each level of the hierarchy incorporates concepts from the level below, beginning with colors and working upward through textures, materials, parts, objects, and scenes. Typically, lower layers of a neural network would fire in response to simpler visual properties — such as colors and textures — and higher layers would fire in response to more complex properties. But the hierarchy also allowed the researchers to quantify the emphasis that networks trained to perform different tasks placed on different visual properties. For instance, a network trained to colorize black-and-white images devoted a large majority of its nodes to recognizing textures. Another network, when trained to track objects across several frames of video, devoted a higher percentage of its nodes to scene recognition than it did when trained to recognize scenes; in that case, many of its nodes were in fact dedicated to object detection. One of the researchers' experiments could conceivably shed light

on a vexed question in neuroscience.

Research involving human subjects with electrodes implanted in their brains to control severe neurological disorders has seemed to suggest that individual neurons in the brain fire in response to specific visual stimuli.

This hypothesis, originally called the grandmother-neuron hypothesis, is more familiar to a recent generation of neuroscientists as the Jennifer-Aniston-neuron hypothesis, after the discovery that several neurological patients had neurons that appeared to respond only to depictions of particular Hollywood celebrities.

Many neuroscientists dispute this interpretation. They argue that shifting constellations of neurons, rather than individual neurons, anchor sensory discriminations in the brain. Thus, the so-called Jennifer Aniston neuron is merely one of many neurons that collectively fire in response to images of Jennifer Aniston. And it's probably part of many other constellations that fire in response to stimuli that haven't been tested yet. Because their new analytic technique is fully automated, the MIT researchers were able to test whether something similar takes place in a neural network trained to recognize visual scenes. In addition to identifying individual network nodes that were tuned to particular visual concepts, the researchers have also considered randomly selected combinations of nodes. Combinations of nodes, however, picked out far fewer visual concepts than individual nodes did — roughly 80 percent fewer.

PARMAR TARUN

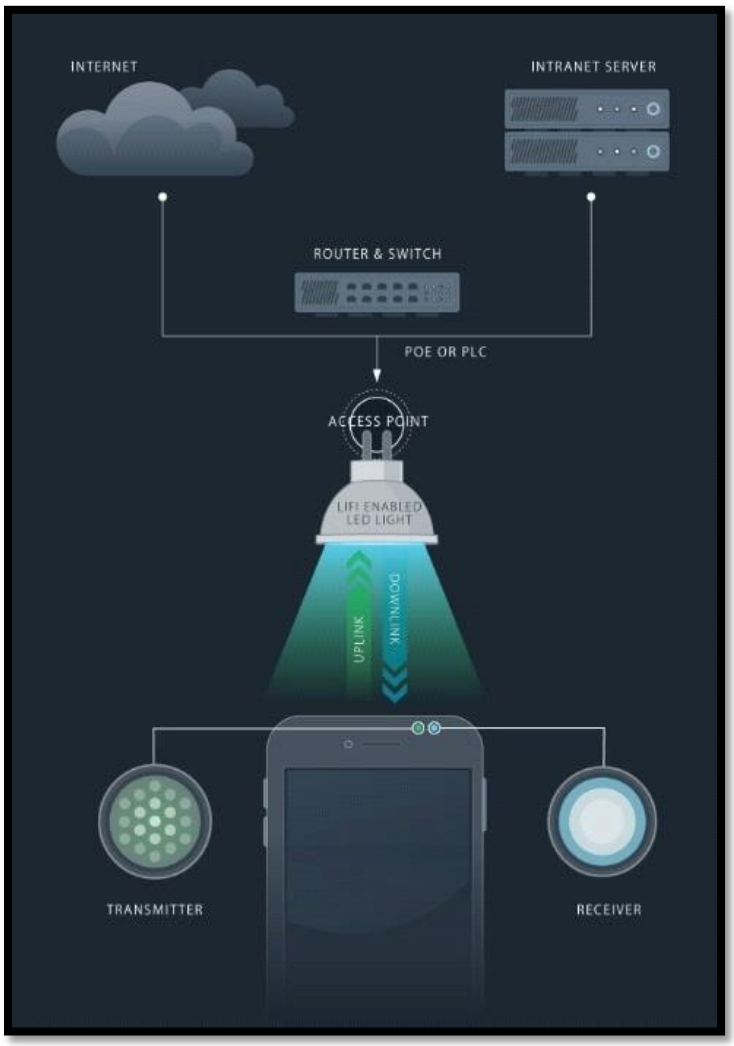
TE IT

Lifi : An upthrust towards future communication

What does Li-Fi mean in layman's term?

- Li-Fi or "Light Fidelity", a technology for the modern era of communications a wireless optical networking technology that uses light-emitting diodes (LEDs) for data transmission.
- Li-Fi is high speed bidirectional networked and mobile communication of data using light.
- It is a wireless technology holds the key to solving challenges faced by 5G.
- Li-Fi is capable of transmitting at multiple gigabits, is more reliable, virtually interference free and uniquely more secure than radio technology such as Wi-Fi or cellular.
- Li-Fi is designed to use LED light bulbs similar to those currently in use in many energy-conscious homes and offices. However, LiFi bulbs are outfitted with a chip that modulates the light imperceptibly for optical data transmission. LiFi data is transmitted by the LED bulbs and received by photoreceptors.

Working of Li-Fi



In digital transmission system, data will be converted in to binary bits in the form of zeros and ones equivalent to ‘on’ and ‘off’ states. Visible light is an ultra fast electromagnetic wave with unlimited bandwidth to utilize. High speed switching of light can’t be detected by human eyes but highly sensitive photodiodes can efficiently detect the modulation of light interact with the detectors.

Compared radio waves used in conventional wireless systems, visible light has thousand times higher bandwidth. Unlimited bandwidth makes it one of the most efficient solutions for data-intensive applications. Li-Fi technology is fast, full duplex and bidirectional communication system capable of data rate upto 224 gigabits per second.

A ceiling based LED lightning fixture encodes and modulates data messages from the internet as light output at rapid speeds to a receiving photo detector, which converts the changes in light density to electrical current.

In turn, the electrical current is converted into a binary data stream and sent to any attached computers and/or mobile devices.

Benefits:

- Higher speed than Wi-Fi.
- 10000 times the frequency spectrum of radio.
- More secure because data cannot be intercepted without a clear line of sight.
- Does not create interference in sensitive electronics, making it better for use in environments like hospitals and aircraft.
- Prevents piggybacking.
- Eliminates neighboring network interference.

Future Applications:

- Autonomous Transport
- Virtual & Augmented Reality
- Smart Home
- Secure Communications
- Enterprise Industry Solutions

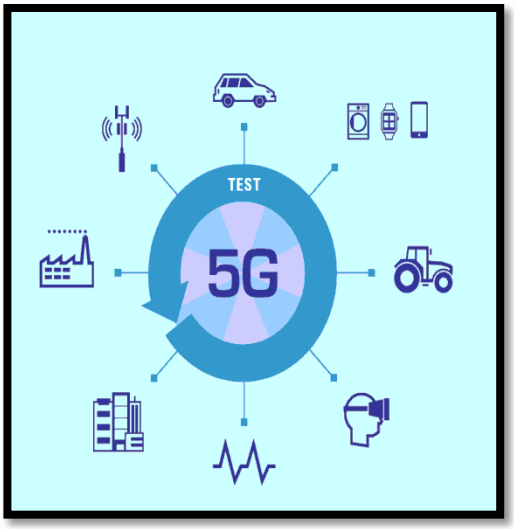
Limitations of Li-Fi:

- Device must be compatible – Li-Fi enabled devices are required to configure network
- Any distraction could stop connection (requires line of sight communication)
- Integration and coordination of device manufacturers is required for standardization.

YASH AJGAONKAR

TE IT

Fast-forward to the future with 5G networks



With a lot of fanfare, excitement and speculation, 5G is slowly making the transition from general idea to network implementation. Network operators are already scheduling 5G network trials and test beds to sort out how the 5G vision will be realized. 5G networks promise to support new services, more video, and cloud connectivity.

5G, which stands for "fifth generation," is an upcoming standard for mobile telecommunications service that promises to be significantly faster than today's 4G technology. It will allow users to browse the internet, upload or download videos, and use data-intensive apps or features such as virtual reality much more quickly and smoothly than is possible now.

Some operators are attempting to be very aggressive with their deployments and push the standards process forward. In the U.S. Verizon formed a 5G Tech Forum in 2015 in partnership with other vendors like Cisco, Ericsson, Nokia, and Apple. The group's goal was to collaborate on early 5G specifications and then contribute those to the 3GPP. Verizon, with input from the group, released specifications in July 2016, separate from the standards body. The company plans to transition to 3GPP's 5G non-stand alone release. AT&T waited until October 2018 to release its first official specifications, after 3GPP released their 5G standard mentioned above.

5G technology is driven by 8 specification requirements:

- Up to 10Gbps data rate - > 10 to 100x improvement over 4G and 4.5G networks

- 1-millisecond latency
- 1000x bandwidth per unit area
- Up to 100x number of connected devices per unit area (compared with 4G LTE)
- 99.999% availability
- 100% coverage
- 90% reduction in network energy usage
- Up to 10-year battery life for low power IoT devices

NIKETAN PATIL

TE IT

Putting neural networks under the microscope

In a study that sheds light on how these machine-learning systems known as neural networks manage to translate text from one language to another, the researchers developed a method that pinpoints individual nodes, or "neurons," in the networks that capture specific linguistic features. Researchers from the MIT worked on a tool (Neuro X) that ranks the neurons of a neural network trained for language translation. The goal of this ranking is to measure the importance of each neuron in the translation process.

In machine translation, a network crunches language data annotated by humans, and presumably "learns" linguistic features, such as word morphology, sentence structure, and word meaning. Given new text, these networks match these learned features from one language to another, and produce a translation. But, in training, these networks basically adjust internal settings and values in ways the creators can't interpret. For machine translation, that means the creators don't necessarily know which linguistic features the network captures. In a paper presented on February 2018 first week's Association for the Advancement of Artificial

Intelligence conference, the researchers describe a method that identifies which neurons are most active when classifying specific linguistic features. They also designed a toolkit for users to analyze and manipulate how their networks translate text for various purposes, such as making up for any classification biases in the training data. In their paper, the researchers pinpoint neurons that are used to classify, for instance, gendered words, past and present tenses, numbers at the beginning or middle of sentences, and plural and singular words. They also show how some of these tasks require many neurons, while others require only one or two.

“Our research aims to look inside neural networks for language and see what information they learn,” says co-author Yonatan Belinkov, a postdoc in the Computer Science and Artificial Intelligence Laboratory (CSAIL). “This work is about gaining a more fine-grained understanding of neural networks and having better control of how these models behave.”

GAURAV GAWADE

TE IT

Bringing neural networks to cellphones

In recent years, the best-performing artificial-intelligence systems — in areas such as autonomous driving, speech recognition, computer vision, and automatic translation — have come courtesy of software systems known as neural networks.

In 2017, MIT associate professor of electrical engineering and computer science Vivienne Sze and colleagues unveiled a new, energy-efficient computer chip optimized for neural networks, which could enable powerful artificial-intelligence systems to run locally on mobile devices.

Now, Sze and her colleagues have approached the same problem from the opposite direction, with a battery of techniques for designing more energy-efficient neural networks. First, they developed an analytic method that can determine how much power a neural network will consume when run on a particular type of hardware. Then they used the method to evaluate new techniques for paring down neural networks so that they'll run more efficiently on handheld devices.

The researchers describe the work in a paper they presented at the Computer Vision and Pattern Recognition Conference. In the paper, they report that the methods offered as much as a 73 percent reduction in power consumption over the standard implementation of neural networks,

and as much as a 43 percent reduction over the best previous method for paring the networks down.

"A node receiving data from multiple nodes in the layer below will multiply each input by the weight of the corresponding connection and sum the results," according to an MIT news release.

In the new chip, input values are converted to voltage and multiplied by weight and then added together. The voltage is only then converted back to data for storage and further processing. The process allows the new chip to figure the dot products for multiple nodes in one step, eliminating the need to shovel data back and forth repeatedly. The group has demonstrated success with 16 nodes in its prototype.

"This is a promising real-world demonstration of SRAM-based in-memory analog computing for deep-learning applications," said Dario Gil, vice president of artificial intelligence at IBM, according to information released by MIT. "The results show impressive specifications for the energy-efficient implementation of convolution operations with memory arrays. It certainly will open the possibility to employ more complex convolutional neural networks for image and video classifications in IoT [the internet of things] in the future."

There is little in tech today that can't be made infinitely better by putting the word 'deep' in front of it. What puts the 'deep' in neural networks really comes down to having a few hidden layers of neurons in between the input layer and the output layer. That's where all the so-called deep learning comes into play.

One can imagine chips in the near future that have larger and more dedicated neural networks implemented in hardware, which can be accessed for all kinds of mission critical functions. For example, the so-called convolutional neural networks that are used here for letter translation are also used in a variety of other image processing operations. They are based individual neural units much like those in the retina, where they respond to overlapping receptive fields in the visual space.

A recent article in Tech Rev. mentions that several companies including Qualcomm, have been developing neuro-inspired chips that function more like living neurons. In other words, they actually generate spikes, which are accumulated and propagated in such a way that their timing matters. These kinds of networks are the real deal that will eventually give humans a run for their money in a game of table-tennis or an egg-toss.

KUNAL BHOYAR

TE IT

How Can Blockchain Optimize Health Care Industry?

Blockchain allows for storing information immutably and network participants to be uniquely identified using public key cryptography. These two properties combined have the effect of making blockchain one of the most secure repositories of data in the world for sensitive information.

In the 10 years that blockchain technology has evolved in the world, it has come far from its beginnings as a financial instrument to impacting nearly all spheres of human activities. From art to real estate and even healthcare, blockchain has found their application a lot of industries. Specifically, with the healthcare industry, blockchain can streamline a number of processes and make the experience for both the end users and doctors better. With enhanced drug traceability using blockchain combined with IoT sensors, pharmaceutical companies can significantly reduce the problem of drug counterfeiting.

By migrating to a standardized way of storing medical records over blockchain across different hospitals and medical clinics, doctors can get easy access to the patients' history which is crucial to making an accurate assessment. Patients would also get much more control over how their confidential information is stored and secured avoiding debacles like the recent Equifax data breach and NHS breakdown.

This decentralization and encryption in distributing, sharing and storing information is relevant to protecting patients' health data. As physicians and providers, we may finally be liberated from retrieving data in a siloed manner, and we can finally access secure data in an econometric, integrated way to optimize quality of care for our patients. Managing and securing healthcare data is just one example of how blockchain adoption will be an industry disrupter. Better data sharing between healthcare providers will mean a higher probability of accurate diagnoses, more effective treatments, and the overall increased ability of healthcare organizations to deliver cost-effective care.

RAVIKANT SHARMA

TE IT

Android Q Beta Release

In 2019, innovation in the smartphones is stronger than ever, with new technologies like edge to edge displays to 5G and even foldable screens. Android must innovate new software to stay up to date with current technologies and thanks to the broad ecosystem of partners across billions of devices, Android's helping push the boundaries of hardware and software bringing new experiences and capabilities to users.

As the mobile ecosystem evolves, Android is focused on helping users take advantage of the latest innovations, while making sure users' security and privacy are always a top priority. Building on top of efforts like Google Play Protect and runtime permissions, Android Q brings a number of additional privacy and security features for users, as well as enhancements for foldables, new APIs for connectivity, new media codecs and camera capabilities, NNAPI extensions, Vulkan 1.1 support, faster app startup, and more.

Building on top of privacy protections in Android

In Android Q security and privacy are at the center. As Android has matured, in this version there are wide range of features to protect users, like file-based encryption, OS controls requiring apps to request permission before accessing sensitive resources, locking down camera/mic background access, lockdown mode, encrypted backups, Google Play Protect (which scans over 50 billion apps a day to identify potentially harmful apps and remove them), and much more. In Android Q, more enhancements have been made to protect our users.

Some of the new features introduced in Android Q

1. Giving users more control over location:
   With Android Q, the OS helps users have more control over when apps can get location. As in prior versions of the OS, apps can only get location once the app has asked you for permission, and you have granted it.

   One thing that's particularly sensitive is apps' access to location while the app is not in use (in the background). Android Q enables users to give apps permission to see their location never, only when the app is in use (running), or all the time (when in the background).

2. New ways to engage users:
   Android Q is enabling new ways to bring users into your apps and streamlining the experience as they transition from other apps.

3. Foldables and innovative new screens:
   Foldable devices have opened up some innovative experiences and use-cases. To help user's apps to take advantage of these and other large-screen devices, developers have made a number of improvements in Android Q, including changes to onResume and onPause to support multi-resume and notify app when it has focus. Developers also changed how the resizable activity manifest attribute works, to help user manage how app is displayed on foldable and large screens. To start building and testing on these new devices, developers have been working hard at updating the Android Emulator to support multiple-display type switching.

4. Sharing shortcuts:
   When a user wants to share content like a photo with someone in another app, the process should be fast. In Android Q, this get quicker and easier with Sharing Shortcuts, which let users jump directly into another app to share content. Developers can publish share targets that launch a specific activity in their apps with content attached, and these are shown to users in the share UI. Because they're published in advance, the share UI can load instantly when launched.

5. Wi-Fi performance mode:
   New Wifi modes have been added to benefit certain applications like gaming. Google says users will be able to toggle on a "low latency mode" which would be beneficial for "real-time-gaming" and "active voice calls."

6. Connectivity permissions, privacy, and security:
   Android Q also comes with hardened privacy protections that'll give users more control over when apps access their location; you can choose to only let an app access your location when it's in use as opposed to always or never. Similarly, there are better controls to keep tabs on what files (i.e. photos, videos, audio, etc.) apps are requesting access to.

Final Thoughts

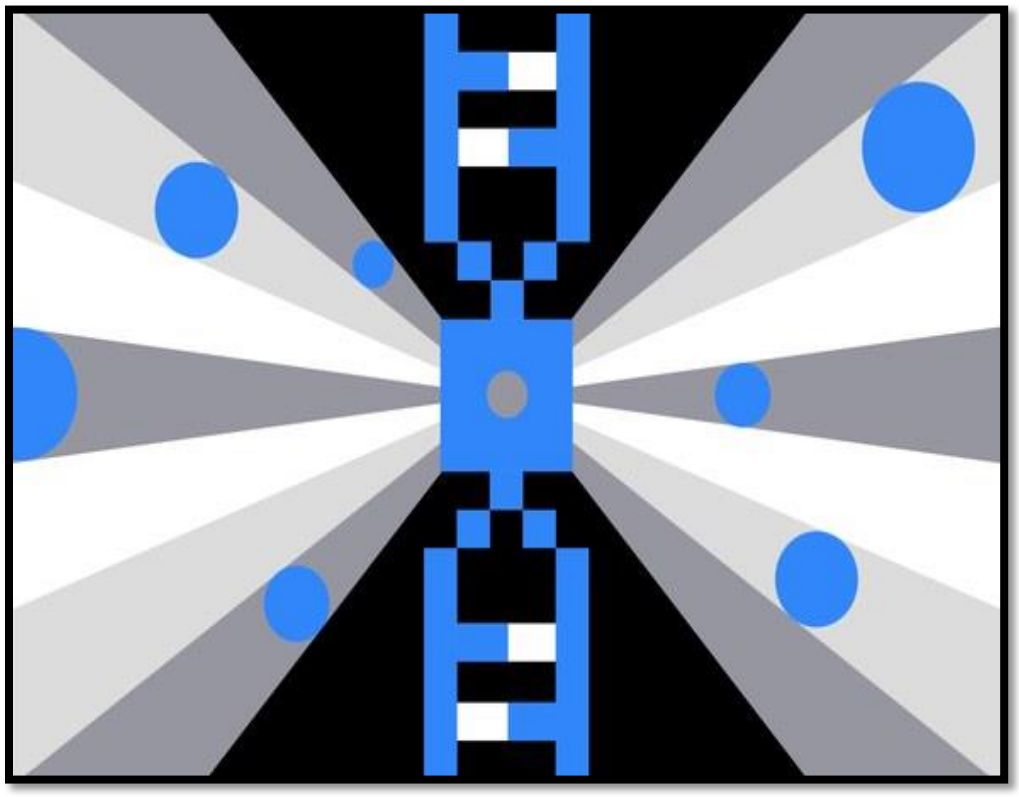
With Android Q, Google brought many changes, most noticeably for the user interface to support smooth transition for the apps in folding phone and improving the privacy and security of end user and providing several new features

That said, it leaves us hopeful for what’s to come in next version.

DISHANT PATIL

TE IT

HOW FACEBOOK MADE A UNIVERSAL OPEN SOURCE LANGUAGE FOR THE WEB - GraphQL



THE CODE THAT runs the web is a melting pot of programming languages and technologies. JavaScript, the most popular language on the web, is the standard for writing code that runs in your browser. But the server side is much more diverse. Java (no relationship to JavaScript) remains popular, as do PHP, Python, and Ruby. Mobile app developers, meanwhile, have their own preferred languages, like Kotlin for writing Android apps or Apple's Swift for iOS.

The diversity of languages creates a need for a lingua franca that applications can use to talk to one another, regardless of the language used to create them. For example, the mobile version of a travel app might need to extract a flight schedule or upload changes to your profile on a server running software written in a different programming language. Meanwhile, application

developers increasingly outsource parts of their software to cloud services that handle tasks such as sending text messages; the companies offering those services need to make them compatible with multiple programming languages. Historically, that lingua franca has been something called REST, short for "representational state transfer," a simple but sometimes blunt approach to sharing information between applications and servers. But a more flexible alternative called Graph Query Language, developed by Facebook, is spreading fast and has won over companies ranging from GitHub to Audi. GraphQL is heavily inspired by another language called Facebook Query Language, which in turn was based on Structured Query Language, the well-established lingua franca of database software supported by Oracle, Microsoft, and other database makers. That makes the structure and syntax of GraphQL familiar to many developers. GraphQL saw explosive growth among JavaScript developers over the past two years, according to data compiled by NPM, which offers tools for managing JavaScript code. The annual State of JavaScript survey conducted by a separate group of developers, which polled 20,000 JavaScript developers about the tools they use, found more than 20 percent already use GraphQL and another 62.5 percent want to learn it, up from 5 percent who had used it in 2016.

How It Works

Adam Neary, a tech lead at Airbnb, says the company chose to use GraphQL because of the limitations of REST. With REST, you can only download predefined bundles of information. If you only want one part of that bundle, you still need to download the whole bundle and throw out the parts you don't need. If you need a little information from each of several bundles, you have to download all the bundles and then reorganize it yourself. For example, let's say you're a mobile developer at Airbnb and you want to add a feature to the iOS app that displays available properties in a particular zip code. In a REST system, you would request property listings by availability and locations, likely with the help of a “back-end” developer. But that could harvest a lot more information than you need, such as the number of bedrooms and bathrooms, the description, the list of amenities, the name of the host, and photos.

If you want your app to display only a small portion of this information, such as the headline and the number of bedrooms and bathrooms, then you either need to filter out the information you don’t need, or get the back-end developers to help you request a different bundle. If you want to make changes, such as adding the name of the host, that will means asking the back-end developers once again to make changes. But downloading unnecessary information will make

your app slower and less responsive."The amount of over-fetching we were doing was insane," Neary says. GraphQL solves these problems by enabling the "front-end" developers who write code for mobile apps or web browsers to request specific information, without backend developers having to predict and define bundles ahead of time. Instead of sending a command to the server that says, essentially, "give me all the property listings available now in 90210" and then filtering out the unneeded information, you could send a command that says "give me the headlines and bedroom and bathroom counts for available properties in 90210." If you later want to add the name of the host, you can do that without pestering the back-end engineer and without making changes that will break older versions of the app. GraphQL has other benefits as well. It makes it possible to specify what type of data you expect to receive in response to a particular request. In other words, if you think what you're asking for a zip code, you can make sure you're getting numbers instead of words, and if you want a property photo, that you get an image file instead of text.

Solving a Problem at Facebook

Facebook didn't set out to create a common language for other companies to use, explains GraphQL co-creator and former Facebook engineer Lee Byron. GraphQL's origins date to 2012, Byron says, "when Facebook started taking mobile really seriously." At the time, he says, Facebook's mobile developers faced problems fetching different parts of user activity feeds. Facebook didn't release GraphQL to the public until 2015. "At first we weren't sure that other companies would have the same kind of problems we had," Byron says. But as he and other GraphQL developers talked to colleagues elsewhere, they realized that others faced the same problems, and had tried similar solutions. "When we explained GraphQL to them, their eyes lit up," Byron says. "They said 'that sounds better than what we have, we'd love to use that.'"As often happens with open source software, a company has emerged to offer commercial support for GraphQL. Apollo, which spun out of a startup called Meteor in 2016, makes a product designed to make it easier for developers to build and maintain services that support GraphQL, along with features designed to boost performance.

SHREYASH MHASHILKAR

TE IT

AVAHAN Achievements (IT Department)

Sr.No	Participants	Event	Achievement
1.	Pranita Redkar, Aditi Gaur Rachana Zha,Shweta Sawant Aditi Pandit, Shraddha Mahala Rinku Tandel, Shruti Menon Hitakshi Patel	Kabaddi (Girls) Departmental	Runner-Up
2.	Milind Purohit, Swapnil Gamre Dhairya Chandarana, Kamlesh Borana Jenil Shah, Kunal Pawar Deepchand Dubey, Yash Meghani Harikrishan Chauhan, Punit Prajapati Raj Kotadia, Gaurav Gawade Pravinkumar Swamy	Overarm Cricket (TE-IT)	Winner
3.	Yash Shah, Umang Tamhanekar Anurag Singh, Swapnil Gamre Milind Purohit, Jenil Shah Punit Prajapati, Dhairya chandrana Samir Pol, Shashank Sumeet Rao	Overarm Cricket Departmental	Winner
4.	Kinjal Patel, Shraddha Mahala Pranita Redkar, Rachana Zha Aditi Gaur, Laxa Devda Shruti Menon, Sushmita Mahajan	Throwball (Girls) Departmental	Runner-Up
5.	Shruti Menon. Pranita Redkar Aditi Gaur, Shraddha Mahala Kasturi Redkar	BasketBall (Girls) Departmental	Runner-Up
6.	Aditya Manze, Deepak Yadav Yash Dalvi, Yash Meghani Hari Chauhan	BasketBall (Boys)	Winner
7.	Umang Tamhanekar, Yash Shah Purvesh Desai, Atul Kumar Anurag Singh, Shubham Pandit Siddharth Suchak, Swapnil Mistry	Volleyball	Runner-Up

8.	Umang Tamhanekar, Punit Prajapati Harikrishan Chauhan, Milind Purohit Purvesh Desai, Deepak Yadav Anurag Singh, Yash Shah Atul Kumar	Volleyball- Departmental	Winner
9.	Shraddha Mahala, Pranita Redkar Priya, Rachana Jha Rinku, Dipti Pawar Shruti Menon	Volleyball (Girls)- Departmental	Runner-Up
10.	Komal Acharekar	Chess-Singles Girls	Runner-Up
11.	Aadil Budhwani Rachna Jha	BE-IT Table Tennis (Mixed)	Winner-Up
12.	Milind Purohit, Jenil Shah Saurabh Malewade	Badminton (Boys)	Winner
13.	Komal Acharekar Shruti Menon	Badminton (Girls)	Winner
14.	Saurabh Malewade, Milind Purohit Jenil shah, Komal Acharekar Shruti Menon, Keerti Suryavanshi Pranita Redkar	Badminton- Departmental	Winner
15.	Umang Tamhanekar	Athletics (100m,200m, Long jump)	Winner

ZEAL Achievements (IT Department)

Sr. No	Participants	Event	Achievement
1.	Yash Meghani Umang Tamhanekar Yash Shah	Treasure Hunt	Winner
2.	Yash Shah, Umang Tamhanekar Purvesh Desai, Sridhar Subramaniam Dipti Pawar, Ankur Jaiswar Revathi Nair, Khushboo Menon Prathamesh Karambe, Sweety Patil Priyanka Patil, Ritu Desai Siddharth suchak, Vishaka Sharma Rinku Tandel, Smita Verma	Group Dance	Winner
3.	Yash Meghani	Neon football	Runner-Up
4.	Kasturi Redkar	Solo Dance	Runner-Up
5.	Yash Meghani Umesh More	Duet Dance	Runner-Up
6.	Yash Shah	Dumbcharades	Runner-Up
7.	Yash Shah	Fact and furious	Runner-Up
8.	Solo Dance	Kasturi Redkar	Runner-Up

Technical Events

SFIT Pragati 2019

Sanchit Sagar Singh, Shreyans Gosalia, Aditya Manze & Sushmita Mahajan bagged First Prize in SFIT Pragati 2019 – Project Showcase Competition

Technical Paper Presentation by Students

Sr. No	Paper Name	Students	Presented at
1.	Attendment - The new age IOT powered AI based attendance solution.	Raj Kotadia, Sanchit Singh Akash Rajpurohit Aditya Manze	Elixir 2018 (Winner) IndiaCom 2019
2.	Smart-Wearable for Visually impared.	Mohit Mathkar Kunal Bhoyar Yash Ajgaonkar	Elixir 2018
3.	Bidirectional visitor counter with automatic room light controller and arduino as the master controller.	Devanshu Sharma Pawan Sharma Swaraj Singh Dhruv Parekh	Elixir 2018
4.	Crack Detection For Railway Track Using Iot	Sandeep Tiwari Kunal Pawar	Elixir 2018
5.	The Alternate Method Of Agriculture: Aquaponics Using Iot	Krishna Soumya Vilas Bhumika Vithal Manasi	Elixir 2018
6.	Object Detection System For Blind People	Gaurav Gawade Harikrishna Chauhan Niketan Patil Dhairya Chandarana	Elixir 2018
7.	Flora export & waste out of best.	Jaspreet Kaur Hitakshi Patel Milind Purohit	Thakur College of Engineering & Technology
8.	Demand for smart home in Indian villages	Krima Shah Prachi Patil Samrudha Mhatre Tarun Singh	India-Com 2019

Elixir 2018

Event	Winners	Achievement
Technovation	Sanchit Singh Sagar Aditya Manze Raj Kotadia Akash Rajpurohit	First Prize
Poster Presentation	Smit Master Manish Lad Kalpesh Shinde Deepak Kharah	First Prize
	Kaushik Raikar Aditya Parikh	Second Prize
Zerone	Kaushik Raikar Aditya Parikh Kritesh Suther	First Prize
	Ganesh Patil	Second Prize
	Rohan Jain Divyansh Gupta Roma Dhake Divya Singh	Third Prize

Hackathon

Name	College	Achievement
Raj Kotadia, Akash Rajpurohit, SanchitSagar, Aditya Manze	VCET Hackathon 2018	Runner-up
Raj Kotadia, Akash Rajpurohit, SanchitSagar	Universal College of Engineering – HackStomp 2019	Winner

Certification Courses

Name	Exam	Score
Raj Kotadia	OCA - Java SE 8	91%
Mohit Mathkar	OCA - Java SE 8	75%

VNPS – 2018

Winners: i. Swapnil Mistry – Object Detection

ii. Ronak Patil, Tejas Patil, Sanket Davane – Drink and Drive Detection

2nd Runner-Up:

Akash Rajpurohit, Ronak Jain, Ronak Mali – Brain v/s Box

Industrial Visit Details

1. Industrial Visit at Accurate Helical Automation Pvt Ltd, Waliv , Vasai (West)

Date of Visit: 06/09/2018

Faculties accompanied during the visit: Prof. Yogesh Pingle.
Students accompanied: SE - IT, TE- IT.

Objective: To make students aware of the Industrial IOT Technology.

Points kept into consideration during visit and outcomes:

- Students were made aware of the functioning of the company.
- The types of springs that are manufactured and the process behind the same was shown and explained.
- Initial orientation given to the students gave them a brief idea about how the company has been connecting clients round the globe.
- An exhibition was arranged which was regarding different kind of usage of springs.
- Students were given a brief idea about the units of manufacturing, quality testing and the usage of robotic arms were shown.
- Applications of IOT in the industry and how students can carry out their project activities were discussed with the managers.

2. Industrial Visit at Bhalivali Village , Virar

Date of Visit: 16/02/2019

Faculties accompanied during the visit: HOD (INFT) Dr. Ashish Vanmali, Prof. Yogesh Pingle, Prof. Anagha Patil, Prof. Maryam Jawadwala, Prof. Vaishali Shirsath
Students accompanied: FE- IT (count- 40), TE- IT (count - 05).
Member of the RSS committee to guide about the visit: Mr.Sudarshan , Mr. Lukesh Band.

Objective: To educate the students about the automation carried out in the village and make aware of how the village can be made smarter using IOT.

Points kept into consideration during visit and outcomes:

- This industrial visit was regarding how the village Bhalivali has become smart in terms of technology and how different people contribute for the advancement of the same.
- During the visit, Mr. Sudarshan, Committee member discussed the problem solved and the methodology applied for the modernization of the village.
- In existing scenario, a detailed information was given from the Rashtra Seva Samiti Bhalivali Project Group like how the Bamboo products were made.
- The students were encouraged to actively participate for developing the village using IOT technology. Also a digital platform for the products is currently in progress by the final year students.
- Prof. Yogesh Pingle and Dr. Ashish Vanmali gave lecture on the importance of visit to the village. Some projects were also discussed for the future. The motive for the students is to implement robotics and IOT in the village.

Results for Academic Year 2017-18

Sr. No	SE	TE	BE
1.	Kotadia Raj - 9.46 CGPI	Karambe Prathamesh - 9.72 CGPI	Chaudhari Krupa Rajay - 8.61 CGPI
2.	Chandarana Dhairya - 9.34 CGPI	Patil Sweety - 9.33 CGPI	Telang Aditi Durgesh - 8.54 CGPI
3.	Singh Sanchit Sagar - 9.00 CGPI	Memon Khushboo - 9.27 CGPI	Bhambid Mittal Ulhas - 8.48 CGPI
4.	Meghani Yash Ashok - 8.73 CGPI	Zha Rachana - 9.15 CGPI	Kashilkar Shivani Vijay - 8.39 CGPI
5.	Gosalia Shreyans - 8.64 CGPI	Yande Mahima - 9.11 CGPI	Raut Krutika Vishwas - 8.35 CGPI

Full Stack Development (Built.io) Workshop:-

- 1st day: - Seminar on Angular
- 2nd & 3rd day: - Seminar on Nodejs and MongoDB by Siddharth Sir.
- 2 Jan 2019:- Workshop on testing by vervali.com & TechUstaad by Nilesh Jain.

Gave explanation over testing

1. Unit testing
2. System testing
3. How to pursue career as a tester
4. Automated testing

- Lastly, 4th & 5th Jan 2019:- Built.io workshop
- 44 students participated in workshop.
- Raw engineering came with 12 of their employees to guide our students. They gave students a project to be completed in 2 days.
- Then the panel judged the 44 students on their project and 13 students were selected as intern for the company.

Core Coding Committee (C3)

About Committee:-

- Core coding committee or better known as C3 is a brain child of a handful of TE-INFT students which focused on peer to peer learning methodology.
- Formed in 2018, it primarily focuses on teaching technological stuffs other than those in the syllabus of Second year's.
- Students across branches have been a part of this culture.
- Notably, students had a keen interest in IOT and demonstrated their interest by making various IOT powered devices.
- One of the notable achievements is that the students have willingly participated in the Elixir-2018 wherein they demonstrated their projects that were their ideas which they achieved within the committee under the guidance of the seniors.
- The program crossed the boundaries of the branch and students from mechanical department also became a part of it. With the co-operation and help of the seniors, a mechanical student created a new musical instrument namely 'Keytar' which was a fusion of keyboard and guitar.

Placement Record

Company	No. of Placed Students
Infosys	32
TCS	14
Wipro	3
Cognizant	1
Feedspot	5
Zeus Learning	1
Bristlecone	2

Number of Students placed: - 58


ELIXIR
Circuit Explanation
There are some sections of whole visitor counter circuit that are sensor section, control section, display section and driver section.
Sensor section: In this section we have used two IR sensor modules which contain IR diodes, potentiometer, Comparator (Op-Amp)
Technical Paper Presentation
Poster Presentation
Zerone
Photo Gallery

Full Stack Developmnent

ECELL Meet Up

VNPS

Hackathon Inauguration

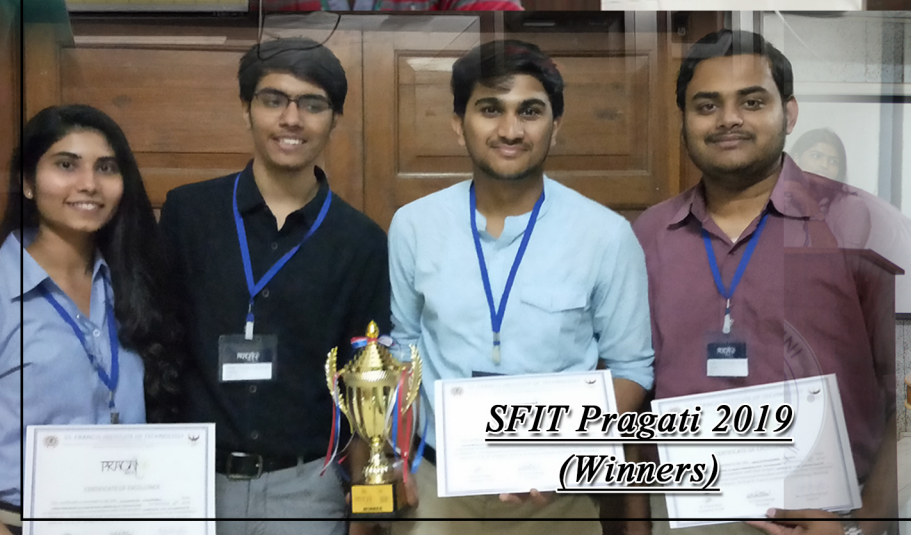
Hackathon Team

Event

Industrial Visit

Elixir Team

Core Coding Committee



SFIT Pragati 2019
(Winners)

Poster Presentation
(Winner)

WITH BEST COMPLIMENTS FROM...

I-TECH COMMITTEE

Department of
INFORMATION TECHNOLOGY

TECH