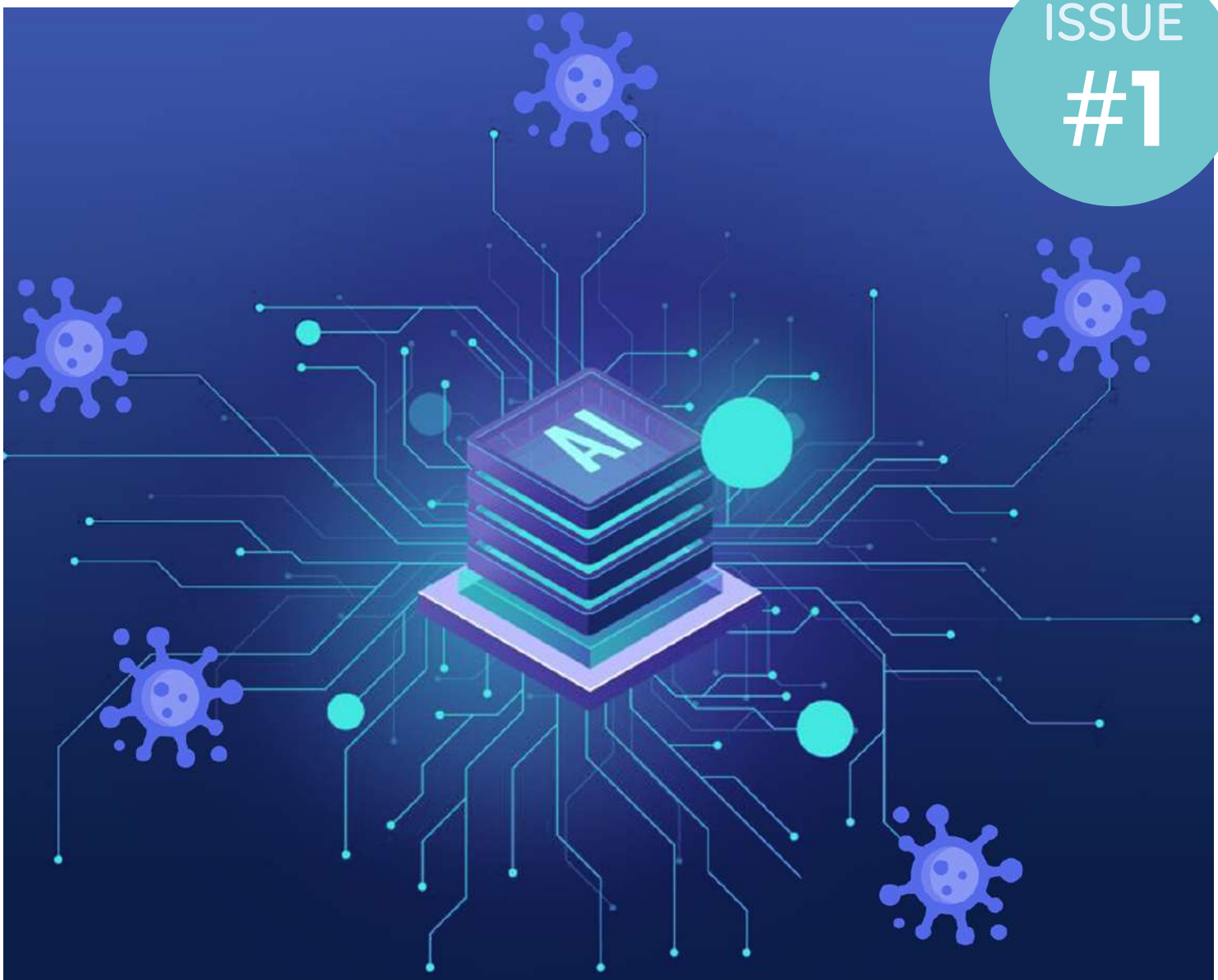
THREADS

CSE ASSOCIATION GCEK - TECHNICAL MAGAZINE

ISSUE #1



100,000 downloads: on the App Store: Interview with Jaseel

Reaching the Stars.....

Behind the scenes with Abhinand & Shilpa

Social Distancing Correctly with the help of AI

MAY 2020 EDITION

CONTENTS

HIGHLIGHTS

REGULARS

ARTICLES

EDITORIAL BOARD

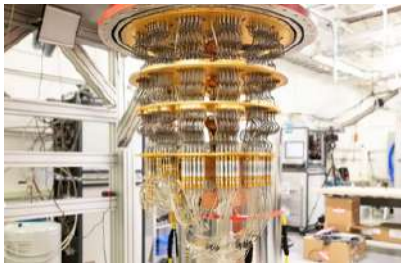
SOCIAL DISTANCING DETECTOR

HOW DO WE MONITOR AND ENFORCE SOCIAL DISTANCING?

How this new technology will help us fight COVID' 19/p17

WOMEN IN TECH

Despite conversations and efforts taken from everywhere around the world, do you think women are still underrepresented, underpaid, and underappreciated in the field of tech?/p13



QUANTUM COMPUTING

Let's check what it is and why it is important/p11

MESSAGE FOR THREADS

Dr. V.O. Rejini
Principal,
GCE Kannur

.Amidst this pandemic, everybody is standing united to fight against COVID-19 irrespective of their professions, trying to contribute to the society in their own ways. The Computer Science and Engineering Department has done commendable effort during this time of crisis by their innovative ideas.

All the best wishes for the first edition of 'THREADS' the technical magazine of Computer Science and Engineering Department for the year 2020. Let 'THREADS' be a platform for our students to voice their thoughts and showcase their talents and creativity.

Dr. Rafeeque P C
Professor and Head
Department of CSE

Engineering education will be incomplete without creative thinking, inspiring innovations and technical writing skills. A technical magazine is a platform to unveil these talents of students. Providing digital version of the same is an attempt to provide a global distribution in an eco-friendly manner.

It is indeed a happy moment for the Computer Science & Engineering department for releasing the first edition of the Technical magazine THREADS for the year 2020. THREADS will be able to bring out the innovative and novel technical ideas of budding engineers.

I take this opportunity to congratulate the contributors and editorial board members for their efforts. I wish them all success in their future endeavours.

HOW BAD TIMES TURNED OUT TO YIELD GOOD VIBES

Arfad Kallil
CSE Association Secretary

The world is going through one of the most miserable situations of all time. We have witnessed the dialogue "Earth is closed today" from Robert Downey Jr. aka Iron Man in Avenger's Infinity War turn into reality. Who would have thought that the initial virus outbreak in Wuhan, China would leave the entire world at the brink of fear, isolation and what not? COVID19, the disease with no immediate medical protocol to follow for cure is indeed a challenge in front of us. But we humans don't lose that so easily. We have put everything under our control to stop this pandemic, starting from lock-downs to the continuing efforts to develop vaccines against the disease. Locked down in your home only with your mobile phones/laptops and your family for a long period will not be a pleasant experience for most of us (except for the introverts).

But Abhinand C and Shilpa Rajeev show us how such situations can be overturned, to identify the opportunity, to apply yourselves and to extract something positive and useful not only for the self but for the society. iClassroom, a virtual classroom model developed by them as a part of the CODE19 Hackathon has been hitting the headlines since it bagged the first prize in the competition. The path to reach this achievement would have been very difficult for them, and that is why they need a round of applause from all of us.

1 lakh downloads for your application on Google Play Store, what can bring you more joy than conquering this amazing milestone during the lockdown? Mohammed Jaseel and his app LRC editor has proven that hard work pays off even during the toughest times. Yet another one, Jithesh Raj put in front of us the fact that not only your coding skills but also your soft skills can pave the way forward, by becoming the best campus ambassador for the event NEO (National Engineering Olympiad).

Realizing that the stories of these people would really inspire the students, we thought of ways to expose those experiences to all. We needed a perfect medium to convey all of it, which brought us directly to 'THREADS'. The idea of a technical magazine for our department as a part of the association activities have been in our discussion for a long time, but we could never let it materialize till now. It's better late than never. Sometimes it is the worst of situations which brings out the best in us.

It's a very proud moment for our institution, especially for the Computer Science and Engineering Department and thanks for bringing the idea of our technical magazine into light. This magazine is the effort of many and every single one of them deserves appreciation. Our part of the work is done and it's time for you to yield some good vibes. We wish to continue this journey of ours with 'THREADS' as long as possible and that would be impossible without you. Hope you enjoy what's in store.

STUDENT ACHIEVEMENTS

Abhinand and Shilpa of S4 CSE emerged as the winners as India's largest COVID hackathon, CODE'19, bagging a prize of USD 10,000. CODE'19 was an initiative by the Silicon Valley based Motwani Jadeja Foundation and hosted by HackerRank. It saw over 6000 participants from all over India and abroad. This achievement by our students is indeed a milestone for our department as well. *[To know more about what motivated Abhinand and Shilpa, and how they tackled this challenge, read their perspective on page 8]*

An app published by ***Jaseel of S6 CSE*** received 1 lakh installations as of April 26, 2020. Going beyond the curriculum and learning new tech and building projects is one thing, but putting it out there and getting such an immense level of acceptance from users all over the world? Inspiring for sure. [To know more about Jaseel's journey in tech and what exactly his app is about, we did an interview with him. Find it on page 6]

Jithesh of S2 CSE bagged the first prize in the All India National Engineering Olympiad Campus Ambassador Program, winning an amount of Rs.10,000 along the way. National Engineering Olympiad (NEO) is an educational organization popularizing aptitude competition and assisting the development of competitive spirit among engineers in India. As part of his responsibilities, he played a leadership role in driving participation in the program from students of GCEK.

Jomel Benny of S2 CSE bagged high jump gold medal with meet record (138cm) and triple jump silver medal in KTU intercollegiate athletics 2019-20.

Muhammed Shasin and Sourabh Subod of S8 CSE bagged the 4th and 7th rank at an all India level for the TCS Xplore Python Proctored Assessment on Python conducted on Jan 25th, 2020. The exam is conducted for students all over India who have been placed in TCS, before they officially join the company.

STUDENT ACHIEVEMENTS

Rishan KP and Mehnaz PP of S2 CSE achieved the first position in the event Webcrafts, conducted by IEEE Kerala Section in association with the IEEE Student Branch of TKM College of Engineering. Webcrafts was a front-end web designing competition where participants could use HTML, CSS, Javascript, jQuery and other open source libraries for crafting a website over the span of 36 hours.

Mathews Roopesh of S2 CSE secured a grade point of 10 in the BTech S1 examinations held in Dec 2019!

11 students of CSE department have qualified for GATE, the highest count for any department in GCEK. The qualified students along with their all India ranks are given below:

Afsal Noor E V
6046

Ameena
15776

Anwaya
14377

Ashwin
13494

Bincy
14377

Kavya
13063

Liyana
2111

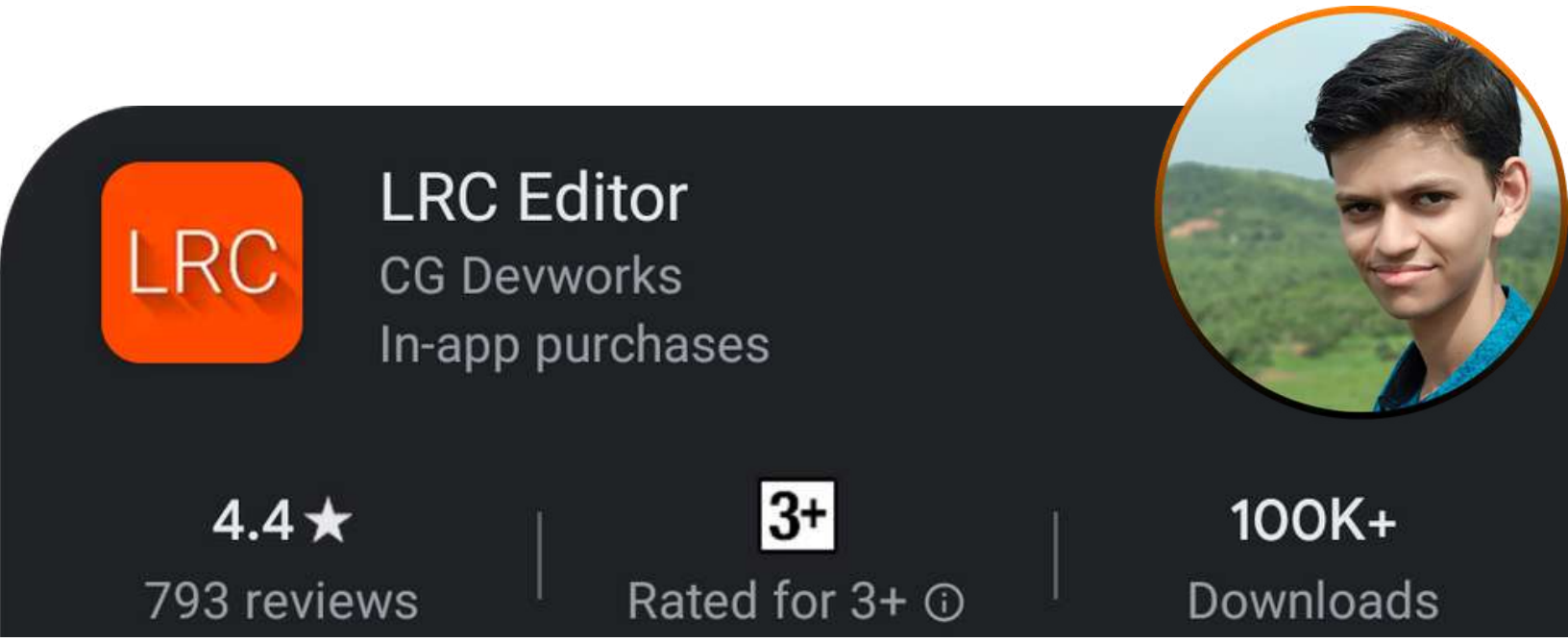
Nithuna
11627

Rahul
16793

Sanoop
7577

Shahana
17348

Recently, one of our own achieved a huge technical milestone - an app published by Jaseel of S6 CSE has received 1 lakh installations as of April 26, 2020! Don't know what all the excitement is about? Let's hear his side of the story, shall we?



When did you first build and publish the app? When did it start gaining traction?

I started learning Android development during S2. Built and published version 1.0 on the Google Play Store on June 27, 2018 (That's during the S2 - S3 sem break). You can find all the old code in https://github.com/Spikatrix/LRC-Editor-Old even commits before publishing on the Play store (Although this repo appears to be forked, I wrote all the code as you can see in the commits).
The new and updated repo is https://github.com/Spikatrix/LRC-Editor. In terms of gaining traction, I started to get around 2k to 3k unique installs in the coming months after publishing. March 2019 onwards, this number increased beyond 3k and it really started to get momentum. I had the highest install count in March 2020 with over 8k installs in a single month although I predict at the end of this month (April 2020), the count will top it as well.

How did you build it? What were the technical skills needed and how did you learn it?

The entire app is built using Java in Android Studio. I learnt most of it by experimenting with stuff. I searched for good text based tutorials and started to attempt them. I never use YouTube based tutorials. Of course, Java is an over verbose language and coupling that with Android means that the code size will increase dramatically and it will be a bit overwhelming at the start but once you get used to it, you'll start feeling comfortable with it. Of course you're not restricted to Java for Android development, Google actually recommends Kotlin. Also, you can make apps in Dart (Flutter), JavaScript (React Native) etc if Java/Kotlin isn't your cup of tea

If you're wondering what LRC is - it is a file extension for a lyrics file format. You can use .lrc lyric files to add lyrics into music players that support them.

What inspired you to create an app like this?

I searched for so long for an LRC Editor application but there was literally no good one on the Play Store. Several stock music players had LRC support already and I needed an editor to make and edit LRC files to enjoy lyrics when listening to songs. Even now, LRC files are hard to find on the internet (If you create a good LRC database on the internet right now, I'll guarantee you'll have a good amount of hits and traffic but make sure you sort out all legal stuff because song lyrics are copyrighted as well) and even if you find an LRC file for your song, it'll have timing related issues amongst some others. All this inspired me to build a good LRC Editor which would be useful for me as well as for others

Tell us about your technical background? How did you begin coding? What sort of projects have you undertaken before this?

I'm currently studying in my third year of the Bachelor of Technology in Computer Science. I began coding when I was 14 years old If I'm not mistaken. Started out with C, fiddling around, making my way around syntax and trying to get my programs to work and it was fun. I was really fascinated by the ability to make computers do something. I then started exploring and experimenting with other technologies.Projects before this? Not much actually. It was more or less fiddling around with different technologies and having fun. I'd say LRC Editor is my actual first big personal project

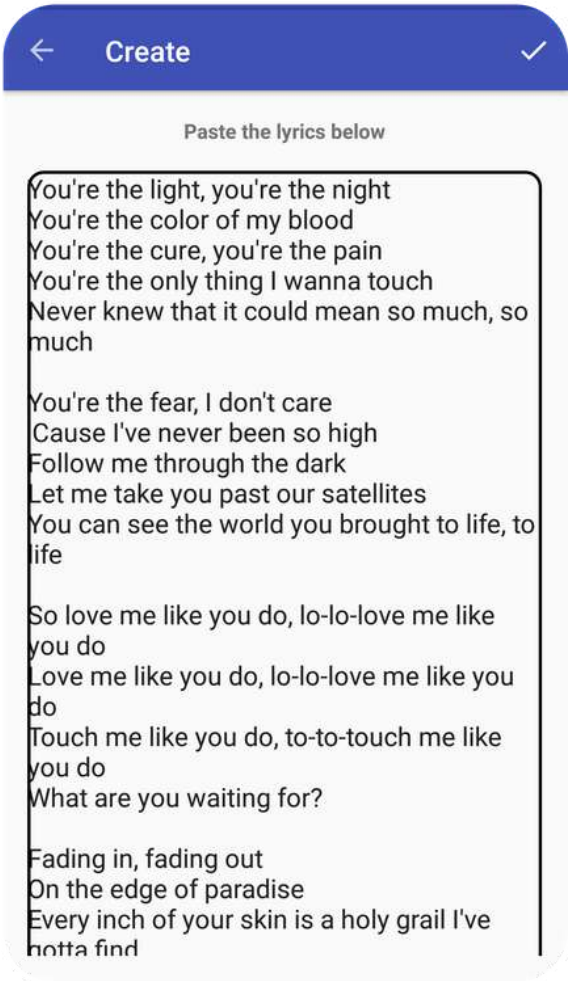
You've mentioned in the app description that multiple translators were involved from different countries. How did you rope in these people?

That's the power of open source. Some of those people reached out via email and translated the entire app for me while some others forked the repo, committed the translations and submitted a pull request which I then merge into my repo and publish.

What is your area of interest? Any plans for the future?

My area of interest is to build useful apps and utilities like these myself. This project itself has taught me a lot in terms of Android development but there's still a ton more to learn. I also like to build fun games and stuff like that. I'm actually working on a strategy game now which will soon be available on Android, Windows and Linux with cross-platform functionality enabled between them.

Screenshot from the App



> *"Started out with C, fiddling around, making my way around syntax and trying to get my programs to work and it was fun. I was really fascinated by the ability to make computers do something.*

Are you able to make any passive income out of this app?

The app has no ads as of now and will never have any ads. It has in-app purchases integrated though which will grant you two dark themes.

#CODE19
HACKATHON AGAINST COVID 19
Hosted by Motwani Jadeja Family Foundation

CONGRATULATIONS!

Abhinand C
S4 CSE

Shilpa Rajeev
S4 CSE

REACHING FOR THE STARS

What led Abhinand & Shilpa to put their best foot forward for CODE'19?Hear directly from Shilpa as she narrates the story.

As the winners of CODE19 Hackathon we are really excited and happy on our achievement. It was really the days of stardom. We are really happy that we could do something to make our family, friends and our college proud.

We came to know about the hackathon through HackerEarth. We felt that 'anyways we are sitting idle at home so lets do something innovative or let's build something of our own'. In the beginning the idea was just to build a video conferencing solution focussing on difficulties faced during online classes, and taking in to concern the situation around the world.

After submitting our idea and being shortlisted to the second round, we started developing our idea further - adding a lot more features to it, we reached the point where it is right now. All the work, preparations and every single communication between us were through phone calls and WhatsApp - these hours long phone calls brought us together. Even then we were not thinking about the prizes. The winners were announced one week after the competition, by that time we had completely left behind the project and was back to our normal routine. It was really unbelievable in the beginning that we were the team that bagged the 10,000 USD.

"It was really unbelievable in the beginning that we were the team that bagged the 10,000 USD."

“This achievement has completely influenced us in all senses - we started getting the kind of exposure that was only in our dreams before.”

Our project the iClassroom is a virtual learning platform, we focused mainly on making learning more intuitive and easier by providing a space for interaction through a social media like platform for which we included the one on one peer to peer calling, live broadcast and the chats sections. Our final aim was to build a large learning community with members around the globe.

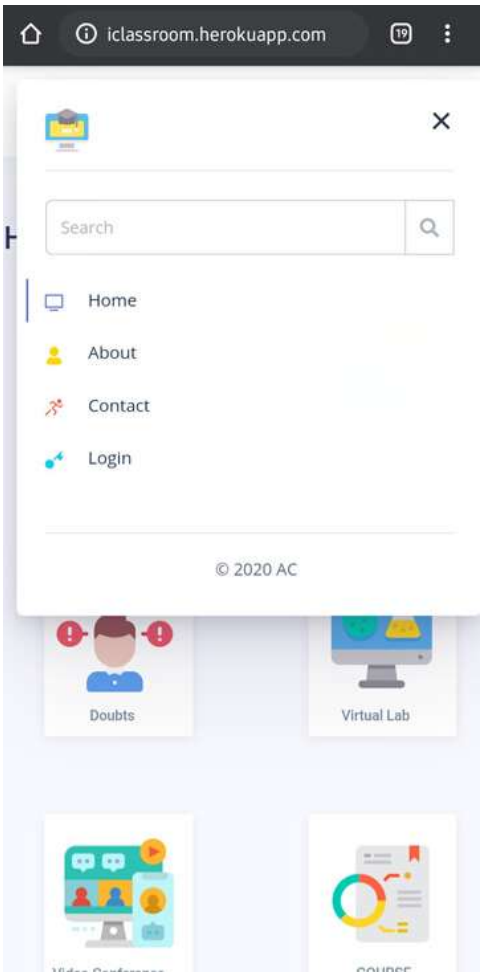
Platforms and Interfaces for iClassroom were developed and created using the latest technology like WebRTC, Django, Node.js, Adobe XD for UX design. We didn’t want students to lose their valuable time and academic session, we haven’t got any idea about when things will be back to normal, so felt like a perfect place for learning and getting ourselves engaged is what we need right now.

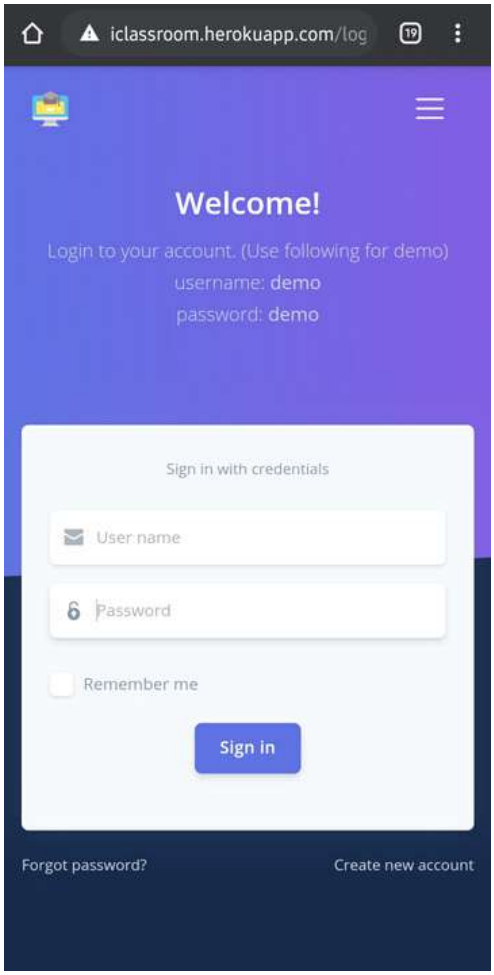
We had learnt those tools and frameworks by experimenting with them while trying out various projects. We got significant experience and built our confidence by using them in doing various works and projects from college, for Robocek (the robotics club of GCEK),

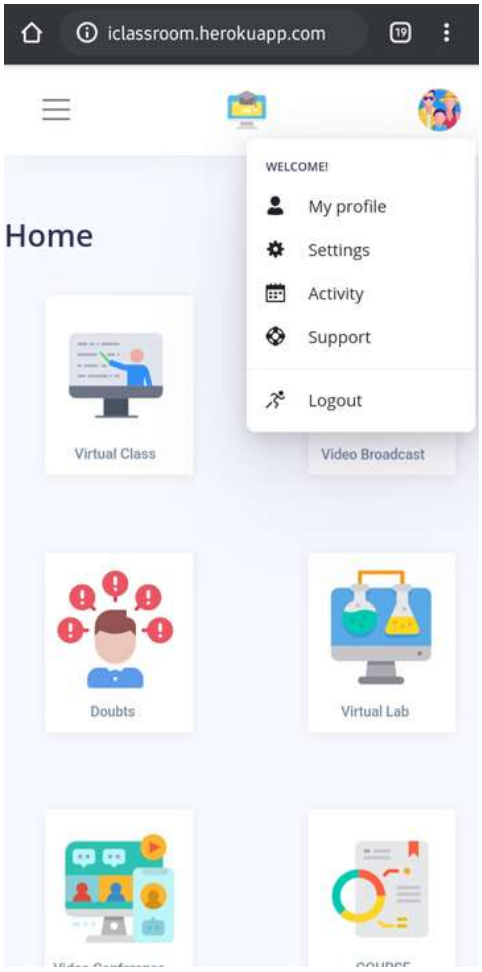
Enfono Technologies and DeepFlow Technologies (startups incubated at TBI of GCEK). We have also done some online courses before. Of those technologies we used, WebRTC and Node.js were learnt during the course of the hackathon. Other technologies used were Bootstrap, jQuery, Git, Heroku.

This achievement has completely influenced us in all senses - we started getting the kind of exposure that was only in our dreams before. We got recognised by a lot of people and institutions. This prize money and attention that we are getting right now is a complete motivation for us to develop this further and launch the product. Even we are getting calls from people ready to buy and implement our learning solution in their institutions.

As of now we are developing the project, researching on the best possible solutions and resources to bring out a stable version as soon as possible. We hope that everyone will look forward to our success in building and launching our App with the same enthusiasm and support.







HEALTHCARE TECHNOLOGY OPPORTUNITIES IN NEAR-REALITY TECHNOLOGIES (AR AND VR)

Asjad Nabeel
Asst. Professor
Dept. of CSE

The healthcare technology market is forecast to reach USD 390.7 billion by 2024 from USD 187.6 billion in 2019 at an annual growth rate of 15.8% during the forecast period, which is almost four times higher than that of the overall industrial growth. So, the healthcare technology sector can be a heaven for the budding IT professionals where they can invest both their trust and skills. The near-reality technologies like Virtual Reality (VR) and Augmented Reality (AR) which are generally assumed to be purely for gamers are but finding their own space and importance in healthcare sector today. The unique powers of these technologies are still being explored in healthcare sectors. It is said, "a picture worth thousand words", but in the context of a near-reality environment (VR, AR) we can even eliminate the need for words itself.

The potential areas in the healthcare sector where these near-reality technologies can be used includes areas like that of Eye-care, where the diseases like Glaucoma, Age-related macular degeneration etc. can be screened by using VR environments with the help of serious games in VR such as "catch the bee". Further, by lending a VR headset, these diseases can be tele-monitored by doctors which helps the elderly people to avoid the pain in paying frequent visit to hospitals. Incorporating Artificial Intelligence, for instance, including the aspects of machine learning and deep learning, can generate a comprehensive diagnosis report which can help clinicians in arriving at proper clinical decision. Further, the VR domain can be customized by doctors in a way that it can be used for rehabilitation of patients as well.

Another major area is healthcare teaching and learning, wherein the VR can be utilised in clearly visualizing complex parts inside human body with proper shape, colour and other characteristics. Further, by incorporating AR, the medical students can learn basics of surgeries by practicing in a near-real environment. The VR also helps doctors to try out complex surgeries before doing it on patients. That means, with the help of different scanning and medical reports of a patient, it is almost possible to model a patient's body part such as spine, heart, liver etc along with that patient's medical conditions. So that the doctor will have an opportunity to visualize exact conditions of the patient before starting a critical surgery. The VR also helps patients with memory loss to explore the places in their childhood memories, favourite vacation spots etc. without physically going there. These are only a few examples of the currently explored opportunities in near-reality pertaining to healthcare.

It is thus obvious that this industry demands not only the skilled techies who are good in converting complex logics into programs but also the people with innovative mind to work closely with health care experts and explore the possibilities of VR and AR technologies to meet their needs. So, if one is confident that he is a person with artistic and creative mind, interested in visualizing things and, to build a futuristic career of 2020, can dive in…!

A Dive Into Quantum Computing

by Edwin Jose George,S4 CSE

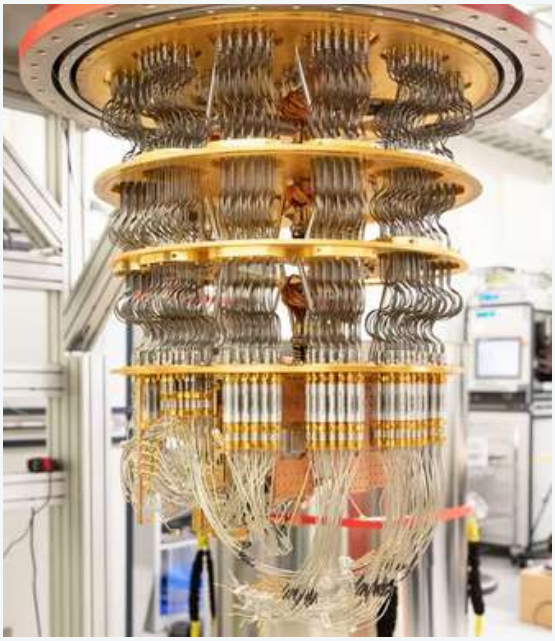
Technology has changed drastically, and so did man's urges for more. Computers have grown from early ENIAC to superfast Supercomputers. Technology made large populations possible; large populations now make technology indispensable. We still are anxious to develop computers more powerful than supercomputers, leading to the birth and boom of quantum computing.

What is quantum computing ?

Quantum computing is the use of quantum-mechanical phenomena to achieve significantly faster computations than classical computers. Dating back to the early 1980s, physicist Paul Benioff first proposed the quantum mechanical model of the Turing machine, a mathematical model of computation which manipulates symbols on a strip of tape according to a table of rules. Since then scientists believed that a quantum computer had the potential to simulate things that a classical computer could not.

How does a quantum computer compute?

Out of several models of quantum computing, the quantum circuit model is the most widely used. Quantum circuits are based on the quantum bit, called qubit, analogous to the bit in classical computation. Qubits are made using physical systems, such as the spin of an electron or the orientation of a photon.Qubits can represent numerous possible combinations of 1 and 0 at the same time, called superposition property. To put qubits into superposition, researchers manipulate them using precision lasers or microwave beams. Researchers can generate pairs of qubits that are “entangled,” which means the two members of a pair exist in a single quantum state. Changing the state of one of the qubits will instantaneously change the state of the other one in a predictable way. The result is that a series of qubits can represent different things simultaneously. Computation is performed by manipulating qubits with quantum logic gates, which are analogous to classical logic gates in classic computers.



A Google quantum computer, shown here without its refrigeration housing, has multiple layers descending from top to bottom, each chilled to a colder temperature. The bottom layer, where the qubit-housing quantum computing chips reside, is only a fraction of a degree above absolute zero

Quantum computers provide no additional power over classical computers in terms of computability, they provide additional power when it comes to the time complexity of solving certain problems.

Quantum computer VS Classical computer

Any computational problem that can be solved by a classical computer can also be solved by a quantum computer, the converse also holds true. Quantum computers provide no additional power over classical computers in terms of computability, they provide additional power when it comes to the time complexity of solving certain problems. Notably, quantum computers are believed to be able to quickly solve certain problems that no classical computer could solve in any feasible amount of time. They can change the landscape of data security by creating hack-proof replacements in cryptography. The intent of quantum computers is to be a different tool to solve different problems, not to replace classical computers. There still exist several tasks that classical computers outperform quantum ones. So the computers of the future may be a combination of both these types.

Quantum computers now - Tech Giants

One of the most promising applications of quantum computers is for simulating the behaviour of matter down to the molecular level. As a result, quantum computers will never lose their feet in the areas that require fast processing of big data. Currently they find their place in various fields like:

Auto manufacturers like Volkswagen and Daimler are using quantum computers to simulate the chemical composition of electrical-vehicle batteries. Airbus is using quantum computing to them to help calculate the most fuel-efficient ascent and descent paths for aircraft.

IBM Q is an industry-first initiative to build commercially available universal quantum computers for business and science. IBM Q Experience allows us to run quantum algorithms either using an online composer or using its python library for free. D-Wave Systems is another tech giant with their flagship 2000 qubit D-Wave 2000Q quantum computer.

D-Wave products are widely used by companies like Google to run Quantum Artificial Intelligence Lab and NASA for their research.

Pharmaceutical companies leverage them to analyse and compare compounds that could lead to the creation of new drugs. Quantum computers are employed to explain complex concepts like mutation, computer hardware, human thoughts etc

.

For now, quantum computers are highly sensitive: heat, electromagnetic fields and collisions with air molecules cause a qubit to lose its quantum properties causing the systems to crash.

The Quantum Supremacy

The point at which a quantum computer can complete a mathematical calculation that is demonstrably beyond the reach of even the most powerful supercomputer is called the era of quantum supremacy. There's plenty of debate in the research world about just how significant achieving this milestone will be. Rather than wait for supremacy to be declared, companies have already started to experiment with quantum computers. The ultimate promise of technology is to make us master of a world that we command by the push of a button. The real danger is not that computers will begin to think like men, but that men will begin to think like computers.

Major firms in the quantum computing ecosystem

WOMEN IN TECH

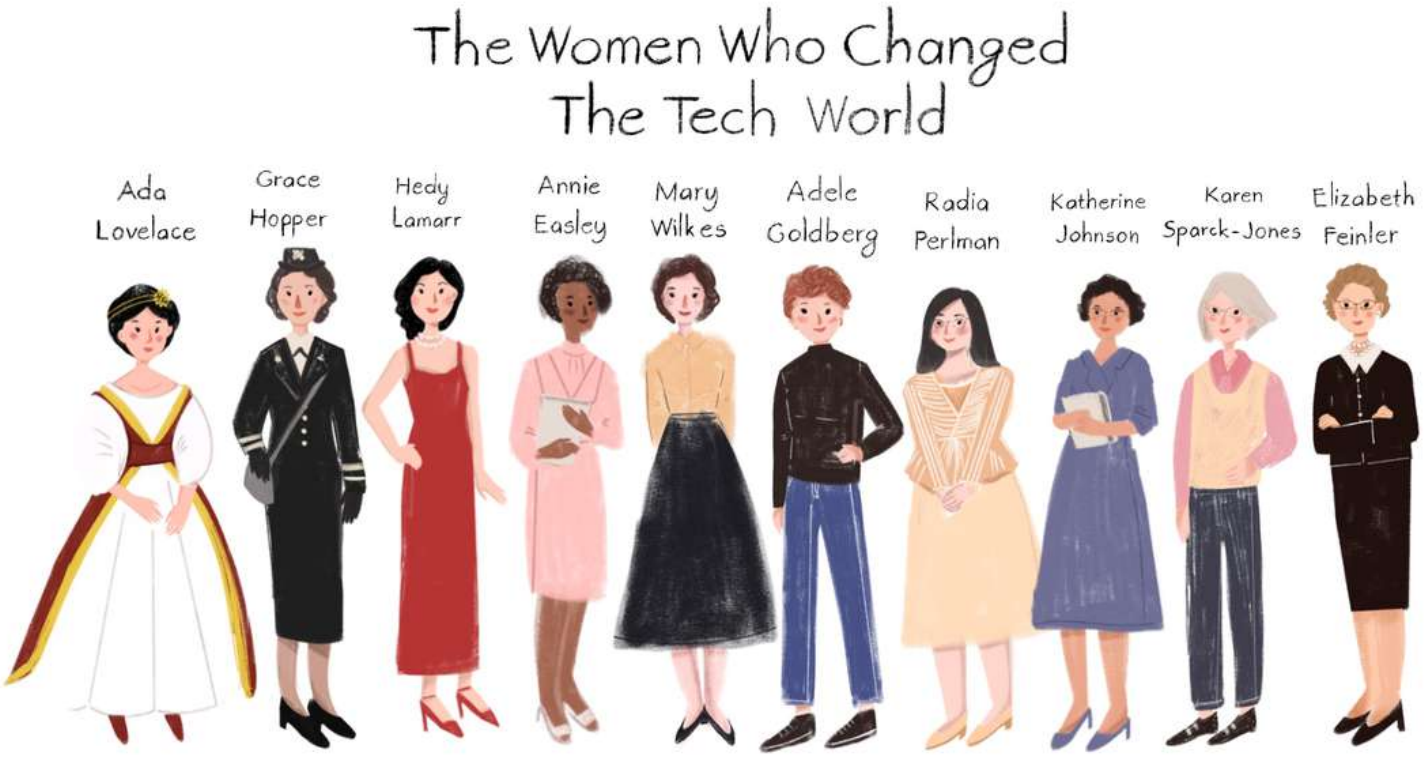
Aparna Rajeev, S2 CSE

Diversity is essential in tech. Gender diversity breeds better companies, sectors, and products that serve the needs of all sections of our society. Humans have been striving for development since the start of time and inclusiveness can undoubtedly avoid the major loss of human resource resulted due to gender inequality. But the reality is, despite national conversations and efforts taken from everywhere around the world, women are still underrepresented, underpaid, and underappreciated in the field of tech.

I should start the list with the infamous Ada Lovelace, a pioneer of the computer age, who is often referred to as the "world's first computer programmer". Her mathematical talent shone through in her early life, and her skills and interest in machines lead to a working relationship with Charles Babbage.Adele Goldberg, another gem in this field, was instrumental in the development of the programming language Smalltalk-80, which inspired the very first Apple computer. The concepts that Adele and her team set in motion became the basis for graphical user interfaces (GUI) we use every day. Undeniably famous in the tech world, Rear Admiral Grace M. Hopper was an esteemed computer scientist and one of the first computer programmers to work on the Harvard Mark I. Her work led to the development of COBOL, an early programming language which is still used to this day.

These strong women, along with many others, laid the foundation that empowered more young women to choose this field. We can now see talented women on the top of various big companies as well as many others who started their independent enterprises. Safra Catz, Co-CEO of Oracle, Ginni Rometty, CEO of IBM, Susan Wojcicki CEO of YouTube, to name a few. The truth is, these women didn't have it easy. The fact that they had to cross bigger hurdles to reach where they are makes them extra strong, but it also poses concern as to why they had to face the difficulty in the first place. From education to employment, inequality is prevalent in all corners in this male-dominated field.

Today, women make up only 20% of engineering graduates, and an even smaller number — 16% — of the engineering workforce is made up of women. 48% of women in STEM jobs report discrimination in the recruitment and hiring process. From facing biased interviews to working in abusive and hostile workplace environments, different women face different issues in all stages. It would also be completely unfair and stupid to put the blame entirely on men. Women themselves share the blame-even now women around the world fail to move out of their comfort zones. They are afraid to challenge themselves and readily accept what the world offers them, even if it's inadequate and unequal. Misconceptions about tech can also cause some women to overlook the opportunities available in the digital world.



In an interesting study of GitHub users, code written by women was accepted 78.6% of the time — 4% more than code written by men. Looking for an explanation for this disparity, the researchers examined several different factors, such as whether women were making smaller changes to code (they were not) or whether women were outperforming men in only certain kinds of code (they were not). Then they made the disturbing discovery: women's work was more likely to be accepted than men's, unless "their gender is identifiable", in which case the acceptance rate was worse than men's.Women in leadership roles faced another issue. When they make a mistake in the public eye, the gravity of the mistake is exaggerated to make it a reason as to why women shouldn't lead- thereby facing more criticism.

Keeping all the world stats and data aside, when we come back to Kerala, more specifically, our college- Government College of Engineering, Kannur is on the right path. It is interesting to note that over half of the annual intake of UG students in GCEK are girls. 'Scheme for Her Empowerment in Engineering education (SHE) ' introduced by the HR cell of GCEK, has conducted various activities aiming to provide opportunities for female students to build confidence and knowledge, ultimately moulding them into future innovators and leaders. "SHE Coders" platform for young coders, 'Lead the Leaders', etc are some of the notable undertakings of SHE. Though it is commonly argued that now in the 21st century things have changed and equality is almost achieved, numbers show that we're not even close. The world needs more enthusiastic tech-savvy women who are ready to break glass ceilings and become role models to young talents. We are definitely moving forward on this journey to attain equality, but a faster pace is what we require.

TECH in Times of COVID

Akhil S Nair , S2 CSE

The rapid spread of the pandemic forced countries to use every trick in the book to contain it. Surprisingly countries like Singapore, Japan have dealt with this better than the so called developed countries like Italy, United States or Spain. A variety of technologies have been used to counter COVID19 and most of them have been accused of being inappropriate, most often for violation of citizens' privacy.

Governments have been tracking people's whereabouts through the location information provided by their phone. It helps to make a route map of the areas that person had been to, before he/she was quarantined and determine how many people were in close proximity to that patient. However this couldn't be implemented in countries with stricter data protection laws like Germany. So they are mainly focused on using anonymous location data to identify public spaces where people are gathering, violating lock down. As for India's Aarogya Setu, it could violate its users' privacy and be a surveillance tool in the hands of the government.

Mobile apps like COVID Symptom Tracker helps to identify the symptoms, risky areas and other things. Corona 100 is another app that alerts a user when he is within proximity of 100 m of an identified infected person. Bluetooth signals in phones are also used in location tracking. CCTVs have also been of tremendous help in location tracking especially in Kerala. They are used to find out where the infected people have been to, warning those who could have been potentially infected.

Artificial intelligence is used for thermal imaging to find out those who might have a fever in a crowd. Also facial recognition systems are used to identify those who don't wear masks. Robots have been utilized for running isolation wards reducing the risk of exposing healthcare workers to corona. Their duties include taking the patient's temperature, giving them medication and food and also disinfecting the ward. Last but not least, drones fitted with cameras and speakers have proven to be useful in dispersing crowds and those who violated lock down to return home.

As engineering students, we should draw inspiration from how science applied practically influences our society and seeing the world being held up by technology during such hard times is something we can always look up to.

Cracking Cryptography

Nivanjana , S4 CSE

Like most of the computer science students I have met, I do have the same desire: a dream of being a hacker. I think the very thirst to know the secrets and hidden picture of the true faces made us go behind it. And I don't know why, most of the films and series I have seen, nourished my wish.

At last, I decided to study the act of hacking the unknowns. That journey actually starts from knowing the security measures in the cyberworld and it's from that path I heard about our actual topic, ***Cryptography***. Many of you may have heard about it already. The trick of hiding the real message in between letters which doesn't have any relation with it. Novelty that I felt towards this trick made me share this, neglecting the words of my online tutor, who told me to be anonymous. In his words, ***anonymity*** is the first quality that a hacker should have. Despite that, I feel I should share this.

What is cryptography? Before getting into it, one should know what will happen if there are no such safety measures. Think about you communicating over the internet with someone else. You pass a message to the other one. Receiver can be of any category starting from your close friend to a reputative officer, bank persons etc. Imagine that you are sending highly confidential data, like your bank account details. What if there is another person coming across your communication channel? He can have access to your message and resend it to the receiver.

Here comes the importance of this encryption method. Cryptography, as Google says, is the practice and study of techniques for securing communication and data in the presence of adversaries. What actually happens is, our message is converted to numerical forms and is encrypted into a new form with the help of encryption keys and encryption algorithms. Encrypted message is called **ciphertext** and it is passed over the channel. The person who has the key to decrypt the ciphertext can access it. So we don't have to worry about someone in the middle. Even the middle one discovers and tampers with the encrypted message, during decryption the receiver will get an error and he comes to know that someone is acting in between him and the sender.

CRYPTOGRAPHY PRIOR TO THE MODERN AGE WAS EFFECTIVELY SYNONYMOUS WITH ENCRYPTION, THE CONVERSION OF INFORMATION FROM A READABLE STATE TO AN APPARENT NONSENSE.

Various keys used in encryption made me think of the craziness of the developers. They are really tricky for sure. Cryptography prior to the modern age was effectively synonymous with encryption, the conversion of information from a readable state to an apparent nonsense. It has various aspects in information security such as **data confidentiality, data integrity, authentication and non-repudiation.**

Knowing more secrets behind hiding the secrets, I was eager to search where these things are actually used. How is it connected with our everyday life? And the answer is, almost all secure searches are encrypted using this technique. Cash withdrawal from an ATM, PayTV, Email, GSM mobile phones, file storage using Pretty Good Privacy (PGP) freeware...and the list continues. To speak on the topic, there is a vast sea and I know I am not yet experienced enough to talk about its more technical sides. But the idea of hiding letters inside letters to hide the truth and the act of filtering it to seperate the real story is interesting. Curiosity that I felt while knowing this hide and seek play made me share this. *If someone takes it as an interest, it is a pleasure right?*

SOCIAL DISTANCING DETECTOR BY LANDING AI

Akshaya P, S4 CSE

In the fight against the COVID-19 epidemic, social distancing has proven to be a very effective measure to slow down the spread. While millions of people are staying home to help flatten the curve, there are several important sectors such as pharmaceutical, manufacturing, where workers are still required to go to work every day. Also, while we go about our daily routines, especially when out on a grocery, social distancing can be a challenging task to uphold. But how do we monitor and enforce social distancing in these cases? We resort to the wonders of AI, of course!

Andrew Ng's start up Landing AI, has come up with a pretty useful tool. Landing AI has developed an AI-enabled social distancing detection tool which can be integrated into security camera systems and detect if people are keeping a safe distance from each other. The major goal behind it is to help monitor and enforce physical distancing protocols in workplaces especially in the current situation.

The company also came up with a working video. As in the demo, on the left is the actual visual of people walking around on the street where each person detected is bounded with a rectangle.

On the right, a corresponding top-down(bird's eye) diagram representing each person as a dot which allows better monitoring.When they are properly observing social distancing, the rectangle and corresponding dot are green.But when one gets too close to another person (less than 6 feet away), it turns red, accompanied by a line linking the two people. The system also issues an alert when anyone is less than the desired distance.

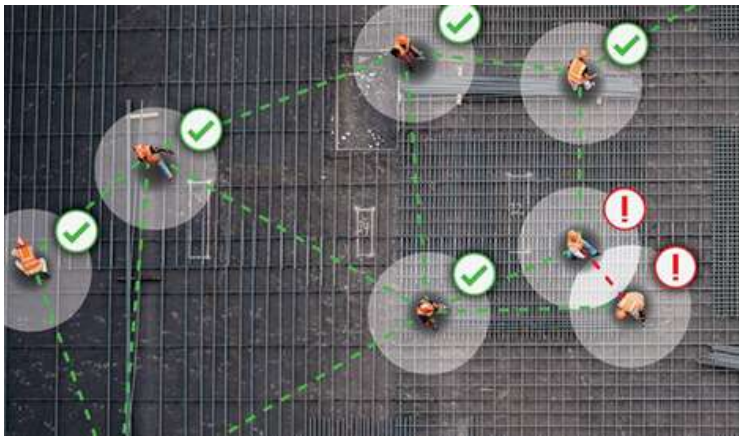
The technical methodology of this tool involves three main steps: Calibration, Detection and Measurement.

Since CCTV cameras usually shoot from one angle, the first step is to transform the perspective view into a bird's-eye (top-down) view. This process is calibration. The method involves selecting four points in the perspective view and mapping them to the corners of a rectangle in the bird's-eye view. From this mapping, we can derive a transformation that can be applied to the entire perspective image. Even for experienced users it's tricky, therefore a lightweight tool has been built that enables even non-technical users to calibrate the system in real time. The scale factor of the bird's eye view is also estimated. i.e., how many pixels correspond to 6 feet in real life.

The next step is detection, which involves drawing a boundary box around each detected individual in the frame. For this task, the researchers applied an open-source pedestrian detection network based on Faster R-CNN architecture, along with non-max suppression (NMS).Region based Convolutional neural network(R-CNN) is an object detection framework which uses a convolutional neural network(CNN) to classify image regions within an image. Instead of classifying every region using a sliding window the RCCN detector only processes those regions that are likely to contain an object. In object detection using R-CNN, RPN(Region proposal network) is the backbone. It's purpose is to propose multiple objects that are identifiable within a particular image. It consists of a Classifier that determines the probability of a proposal having the target object and Regressor regresses the coordinates of the proposals. NMS is used to eliminate redundant boxes and find the best fit. They also chose real-life assumptions for the same, such as humans being taller rather than they are wide.

Now, given the bounding box for each person, we estimate their (x, y) location in the bird's-eye view. The last step is to compute the bird's eye view distance between every pair of people and scale the distances by the scaling factor estimated from calibration followed by giving respective colours. Since the rise of computer vision has opened up questions about privacy and individual rights the company ensures that their current system does not recognize individuals.

In the fight against the COVID-19 epidemic, medical staff are on the front line, risking their own lives. But behind the lines the war is fought by the computer scientists using an array of AI and data science technologies.



As medical experts point out, until a vaccine becomes available, social distancing is our best tool to help mitigate the virus and as we open up the economy. The goal of the company with creating this tool and sharing it is to help all and to encourage others to explore new ideas to keep all safe. Let's hope for the best. Until then - stay home, stay safe!

When its time to say goodbye...

As I walk down the memory lane, I find quite a lot of moments to cherish. But my college life definitely sticks out. Maybe because it was when most of us came out of our shells, definitely my case. Putting it in an another way I became more sociable, for someone like me spending 12 years of my school life in the same school, around the bunch of familiar faces, the same route to school and the same set of teachers all throughout, life seemed very familiar and easy because people around me knew who I was and it seemed like my own backyard. College life came with its own challenges and tolls. From leaving the comforts of your home, being around total strangers and at times being all by yourself, all had its own hand in the making of what I am now. The last 4 years have seen it all, a spectrum of experiences - from the highs to the lows I have seen it all, including the most interesting and weirdest things ever to have happened till date.

Dhyan S Babu

College life was definitely "one of a kind". In the midst of getting to know the new environment and people first year flew by. It was enough time to blend in. With all these annoying and delusional people around it slowly started to feel like home . The insane festivals and celebrations are indelible. Being sociable played a major role in my life, courtesy NSS and ISTE. The camps I attended for NSS and the numerous ISTE programmes all sculpted the present day me. Whether it be public speaking or talking to a stranger it taught me all. Academics plays a major role in building a career but the relations and memories you take with you after the 4 years is definitely the best part of college life. The ever so friendly seniors and the equally insane friends will surely be something I will have for the rest of my life. The only regret I have at this moment is not being able to enjoy the final year just as the past three were but I am sure we will come up with something to compensate it all. And finally for all the juniors reading this - never compromise your academics for some light-hearted pleasure, try to find the prefect blend between building a career and enjoying college life. Bunk classes, meet a bunch of people, be a part of everything and most importantly enjoy the 4 years to the full extent, they are the best thing to have ever happened to me.

Alida Parnai

GCEK, this was not merely a college phase of my life. Rather, it was a place where I dove into the blended ocean of perfect joy and hardship.

For an 18 year old teenager, the comfort that GCEK provided was enormous - the ragging-free campus, friends (who turned out to be family in the end), not-the-usual-kind-of seniors and many more .

The sudden shift from what I had learnt to what I should learn, made my first year a struggle. Rather than taking a leap, I made my pace set. It's much more easier now. I started loving this and I now call myself a Computer Science Engineer.

We shifted classrooms, if it was in the top floor first year, the next year it would be in the second floor. And my favourite was the top floor, that tussle to get into the class before 9'o clock especially if it was Najeeb sir or Rafeeque sir in the class. It literally got me out of breathe.

There is so much to remember from. But here I would like to quote a small one - Switching Theory and Logic Design aka STLD. This paper gave me nightmares. Maybe some of you would feel the same. This particular one had a special thing on me. Not so surprisingly, it hit me my first and only supplementary. For a person who constantly heard about campus placement, job, scholarship - this was more than enough to bear with. And this happened on the day we went to our first IV. I thought STLD could spoil my happiness, but it was nothing compared to the happiness my friends gave me. Once the revaluation result came... I passed. Believe me, it was such a relief and to add more happiness I got a refund for the revaluation fees too. But later I realized marks are not the things that ever mattered. It was always the little moments in college that we cherished. Always.

Everyone leaves college with a degree. But I am among the ones who leave their college, holding tons of memories along with their degree. Hope you are also one among us.

Pooja Haridas

Randomly did I walk this way but now when it's time for me to step out, I realise GCEK was that stage that painted me with the best of shades of experiences, exhilaration and tonnes of memories to enlighten any dais. Be it the people, patterns, or pillers of our pink paradise, it has shaped me well in every perspective possible. With the first day memories still afresh in my brain where I was a little skeptical about whether this was the right ground for me to play my best, day by day I found myself in the ground I would wish to play forever.

Being at Prof PC Thomas for a couple of years, GCEK opened the gates of new found freedom to explore myself deeper and deeper. The first year moved with series tests, assignments and fun with classmates .The later years we were more grounded , surrounded with juniors and seniors alike discussing what better things were to be added to the NSS, IEEE, ISTE, FOSS clubs - all those extra curricular platforms available, baked fresh with ideas and iced better with friendship.

To be a better person, from teaching me how to deal with high profile alumni to handling petty disputes, balancing academics to brightening stars in my resumes everything is glammed up with the touch of GCEK. Be it my college or my department, I am eternally grateful for all those smiles and frowns that straightened my back building the confidence in me to fly in the sky.

Megha Santhosh

Being an engineer was never what I craved for, yet here I stand, a happy and a proud GCEKian, enjoying the last few days of this beautiful journey that made me who I am today. It was a totally new experience, away from home, being a hosteler, new environment and a lot of new faces. Four years down the lane, GCEK has become a home away from home, with friends who became family, memories that I could cherish forever in my life, academic achievements, and several ups and downs that came along!

When I had to choose Btech, I was sure that I would take Computer Science and Engineering. I was not sure of how it was going to be, but I gave it a shot. It was difficult to adapt to this new phase, long classes, writing lecture notes, programming, coding, labs, assignments, records - there were a lot to handle.

Though things didn't get easier, I was getting better at handling them. The days before the semester exams were the real sleepless nights. The time actually flew like someone was waiting for him! There was little time and whole lot of portions to be covered and a consistent thought of exams going to be postponed or boycotted. I had some of the worst ightmares of my life - Engineering Mechanics, STLD - but somehow managed to get through it all. That's what engineering actually taught me, to never give up, to find ways to make things work.

I have had good and bad days, but I can say these were the best days of my life. Though it's hard to accept, it's time to be called as an Ex-GCEKian.

Arun Raj

Being the nearest college to my home, I was not at all interested to join here - I was hoping for "some better college". But the trend or fate ended up with a final allotment in GCE Kannur. I joined with the thought of college transfer after first year. First day of college, I still remember in every finest detail, like everyone else, I was also scared about ragging and all that - but nothing happened, literally none of the senior even bothered to make me dance or sing. All those months of practice, sleepless nights, went for nothing. At the end of the first year I changed my mind, I didn't try for a college transfer, no the low GPA was not the reason, there was something else... It might be the friends I made, the college atmosphere, I don't know...

Being someone who went for IIT and ended up in Kerala IIT, my fight with the academics were mere a night long, and I just aimed for C. Non academics were much more interesting. Joining IEEE gifted me a few achievements and recognition, NSS gifted many memories and friends. Soon the monotonous boring life kicked in, procrastination was in the air. Many subjects seemed unwanted and a "pain in the class". Something that kept us all "running" were those backbench talks, the Google and Apple that we made from there never really took off.

Anyhow semesters flew, some of them gifted backlogs, struggles in the labs, late night assignment works, sleepless nights, sleepy lectures and countless exams... Everything came to an end soo fast. It was time for the campus placement, many "unwanted subjects" helped a lot, no, not more than the non academic experiences. But still many subjects I thought were unworthy, proved worthy. For a so called backbencher, the subjects always seemed worthless, but those little bits of knowledge that were injected for the exams stayed there, and now it has helped a lot in interviews. I might have skipped, slept in the classes, but those little bits of knowledge that got into me, was worth it. I am not able to mention the faculties who had believed in students like us, in this small paragraph. It won't be enough to thank, the immense effort they take to train the so called future engineers or developers.

Now being locked down, it seems these two months are much longer than those 4 years...

Amegh P Arun

Falling into a professional course and my journey through the other side of my expectations in Government College of Engineering, Kannur built me to deal with the world. Going through the field of Computer Science was something driving everyone crazy and that was how I ended up opting for it. Starting from 2016 to 2020, I would always remember how I felt in the first class and how it feels now. Everything has changed too fast. The four years have went down in the speed of light with star studded memories and lessons.
There are always two types of people in college, the ones who have studied in college, and the ones who have 'lived' there. for some people college would have become their second home. The one thing I have missed a lot in the past weeks staying at home is my class rooms and it's noise with my bunch of friends.

The sleepless nights in college were always memorable. Those nights were the ones in which we found the joy of silence. It was always 'Responsibilities' which has defined my path in GCEK. Even though 50% of my journey was beyond the borders of lecture rooms, these responsibilities helped me learn things which were not in the academic - among them, crisis management and decision making were the crucial skills I always like to mention after these four years.
I only have one thing left to say - as future engineers, it's not enough that you make use of your degree for your sustenance. Once you've gotten comfortable with your place in the world, remember to always give back to those who need it.

ASSOCIATION INAUGURATION - Report

The Computer Science and Engineering Association Inauguration for the academic year 2019-20, was held on February 13th ,2020. The formal ceremony started by 10:30am at the College Auditorium. The chief guest was Mr. Roopak A.N., CEO of VoxiLabs and an alumnus of GCEK. The welcome speech was delivered by the association secretary, Arfad Kallil. Our Principal Dr. V O Rejini, delivered the presidential address, while Head of Department Dr.Rafeeque P C and Staff Advisor of CSE Association Prof Rajeev K K delivered their felicitations. The chief guest inaugurated the function by lighting the lamp, in the presence of staff and students of the computer science department.

The chief guest, Roopak A N addressed the students of CSE in an interactive session focused on career options for computer science graduates, latest technologies in the field and ethics in technology. The speech, despite being short, was inspiring and impactful. The vote of thanks was delivered by Liyana Sahir of S8 CSE. The ceremony was concluded with Prof.Asjad Nabeel of CSE Department presenting a memento to the chief guest, Roopak A N.

At 12pm there was a colorful procession by the students of CSE Department from the front gate to the main block. There were also two events conducted in association with the inauguration. A treasure hunt was organised by the third year students on the same day. Another event, blind fold was conducted by second years as a pre-event on the day before. Students from all departments participated in the events and won prizes.

FROM THE EDITOR'S DESK

When Jaseel's achievement came into the limelight a couple weeks back, I asked him a few questions to understand the story behind his app. I was curious to know more - and if we could convert the information received from him into a small write up that could then be circulated on our groups as usual, what if it inspired someone who was taking their first steps in tech to try something new?

Receiving Jaseel's quick, concise and crisp responses, Arfad and I realised that this was beyond a small write up - there was enough useful information in here that could be published as a whole. While brainstorming what to do and and after a discussion with our HOD Rafeeque sir, we realised that there were more stories that should be put out into the open, and thus *Threads* was reborn.

Everyone knew about Abhinand and Shilpa's achievement, but nobody knew what was going on in their minds when they set out to participate in this hackathon - what prompted them to register? What were they thinking off over those 72 hours as they developed their application? How did their experiences from college over the years help them in achieving this? When approached with these questions, Shilpa was ready to pitch in and share their story with sincerity.

We soon had a small team of enthusiastic content creators and designers, all buzzing with energy to bring out *Threads*. Each and everyone listed in the following page have been instrumental in the creation of this edition of *Threads*, brainstorming topics of relevance in our current times. "What were the stories that were worth sharing?" They quickly got down to compiling and crafting the necessary info to the best of their ability, while Anugrah and Mehnaz sat down to capture it all beautifully with their designing skills.

With the final days of college being spent at home in a state of lock down and with none of the usual hustle and bustle of farewell ceremonies or final day celebrations, it's indeed a gloomy time for the 2016 batch of GCEK. And yet, *Threads* opened up a canvas for some of them to talk about their experiences and memories, the ones that would normally have been shared in front of the entire class, with all our teachers by our side and roaring with laughter at the paths we had taken and the ups and downs, along with that twinge of sadness that accompanies you when looking back, before leaving the comfortable shelters of GCEK.

Our sincere gratitude to Rafeeque sir, for pushing us to do our best and go the extra mile. Nabeel sir was also swift in responding with an article of his own, which we were delighted to receive and include within these pages.

Now, *Threads* is out in the open for you to read, learn, consume and to scrutinize. Feel free to let us know what you think so that we may keep improving. Hoping this dynamic team will be able to bring out more (and better!) editions of *Threads* in the future,

Signing off,
Liyana Sahir

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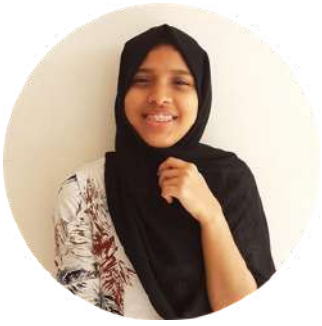

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