BITMAP

BASIC IT THINGS MADE ACCESSIBLE TO PEOPLE

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St. Xavier's College
Mumbai 400001

PROVOCANS AD VOLANDVM

BRIDGING THE GAP BY CONNECTING THE DOTS

The digital world is seen as the categorization of people belonging to two tribes, the digital natives and the immigrants. Where the immigrants are the ones born prior to the dawn of the emergence of modern technological advancement where things were seen with different perspective as compared to now. If you observe them closely, they are not completely apart from each other in terms of communication; it is just their approach of looking at the same thing that sets them apart.
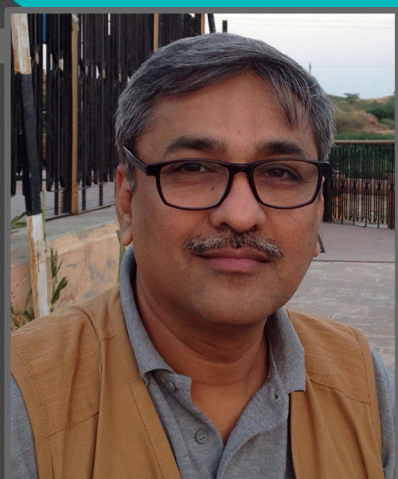
FROM PRINCIPAL'S DESK

The immigrants were/are definitely wiser in terms of good decision making and are not opposed to the idea of exploring or embracing technology. Barrack Obama, the then president of United States of America, a pre-digital native, utilized the power of the internet for enhancing his fundraising ability as well as connecting with the people and the need to receive instant updates that play a key role in wise decision making.

While the pre-digital era survived on bureaucracy, the digital natives boast about embracing meritocracy, which is true to quite an extent. The natives are capable of and have been constantly coming up with solutions to all those challenges faced by the immigrants in the past. Solutions come in the form of plagiarism software that scans through huge databases the world across to prove whether the work is authentic or not. A lesser known good singer having no access to music houses can become a rising star thanks to the video going viral on YouTube. A good programmer can share his work on platforms like github and gain a reputation. Blockchain as a technology will hold the key solution to the identity theft crisis that we have had in the past and will continue to face in the coming future.

While immigrants tried to build institutions, natives look at the whole world as one. Immigrants could relate to the 9:00 to 5:00 but natives are workaholics where they follow the world time communicating with customers across the globe sometimes as a BPO executive or the project in charge of an online e-commerce company that just found global customer foothold etc. The advantage here for the company is that it receives high productivity in comparison to the immigrants who happen to be more value oriented. Getting things done quickly does not always mean that it justifies the end. Immigrants have hindsight of looking at the future repercussions of their actions which happens to be one of the parameters behind decision making as compared to natives that live on decisions made with respect to the present.

This virtual distinction will always continue as the circle of life, completes another iteration, when the digital immigrants fade out and a new generation will succeed the digital natives. This will happen because generations are simply oppositional in nature. But you as digital natives can still bring in a change while you can, teach the immigrants on how to empower themselves with the available digital resources without having to depend on another immigrant or native for their daily needs thus achieving their goals quickly, meritocracy over bureaucracy thereby building a solution that is horizontal in nature, how to drop boundaries and collaborate with people across nations. It is rightly said that learning is a two way process at the undergrad level, the lessons that the natives should pick up from the immigrants are, with respect to making a place for values in life while the world around them thrives on cutthroat competition, how to maintain and retain relationships (professional and personal) that go beyond achieving tangible benefits and most important of all the use technology to revitalize and re- purpose existing institutions for the true growth of a nation.
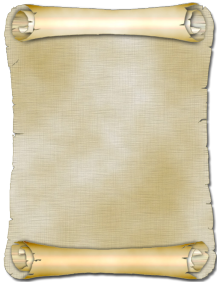

From Principal's Desk
Dr. Rajendra Shinde
Principal
St. Xavier's College Autonomous, Mumbai

Make IT Affordable

-Former Principal and Prof. Agnelo Menezes

In August of 2018, We (The editorial team of BITMAP) had the honour of interviewing Professor Aggy(insert full name) right before he would resign from his post as principal of St. Xavier's college. There were a lot of questions from our side which answered with such grace and insight it will be hard to forget anytime in the near future.

We began our interview by asking him about his aspirations for the IT department of St. Xavier's and if he had any specific goals in mind. "Yes.", He replied immediately, "When it comes to innovation, IT and Xavier's, I would like to see what kind of products can be generated or tweaked, if already existing, to make them more affordable so as to make them more reachable for the lower income groups." He also wanted to know what the students of BSc(IT) could do to accomplish the same, with which our magazine coordinator, James Barbosa who is also a third year IT student, replied explaining how most gadgets are expensive only because of the hardware they are using and the manufacturing processes. "A simpler manufacturing process eradicates this issue. In fact, we can build laser systems or finger print scanners right here on campus with the hardware available to us here." James also revealed that a few TY students are working on building a mobile application that will directly scan finger prints to simplify the attendance system. "I would like to see that and maybe we could even offer it to start ups for mass turnout. It is my dream that you make it affordable for NGOs and other non-profitable groups." Prof. aggy replied with a hopeful sight for the future.

When asked about how innovation can help in striking balance in society, Aggy Sir talked about innovation being a leveler when it came to social standings. He gave examples of how even security guards and canteen workers own smartphones though their salaries aren't much. In his own words, "It should make technology more and more accessible to people with lesser incomes and financially struggling masses."

With the recent news of Uber and Tesla releasing automated cars soon, we asked Aggy sir his opinion on the same. He thinks it would be a big flop in India as we do not have that sort of infrastructure or regulation. He would not encourage students to use it either as it would mean they promote the idea of one, chauffeurs losing their jobs and two, bringing a car that is not compatible with the infrastructure of our country. "There are also high chances of accidents due to the high density of pedestrian-car relationship on the roads" he added.

"If cyborgs are being used as a showcase of technology then I will say yes, but if they are being used to displace labour or to make labour lazy then I'm not in favour of it." He said when asked about use of drones and cyborgs by students on college campus. He continued with his concerns of how our campus is too small for such gadgets and they would create too much noise which might distract students from their lectures. He also believed that since we have high roofs and balconies, it almost makes the use of drones unnecessary.

We were curious about his views on the recent changes being bought about on campus, like the installation of Wi-Fi routers throughout college, to which his reply was that he "prioritized utility over aesthetics". To move forward with technology, we need to leave the emotions

attached to aesthetics, he explained. He clarified further that Wi-Fi routers and such should not overpower the natural beauty of the college but if push came to shove, "I would not sacrifice going forward with technology because of architectural aesthetics."

Another major issue that comes to mind when talking about IT is digital privacy and that's exactly what we wanted our former principal's opinion on. He had many insights to share including his concern about the plethora of personal information available online and how easily it can be manipulated and or abused. "Privacy needs to be protected and I'm not saying that this should be used to hide illegal activities" he explains, "I'm just simply saying there should be a way in which I should be able to control what information you are getting of me."

Technology is slowly taking over the world and with this outtake, the paper industry is facing all time losses. Digital media and platforms are the new trends and old-school books as well paper assignments are slowly fading out. We discussed this in further detail with Aggy sir where he believed that libraries will soon be replaced with other platforms like Kindle as the newer generations emerge. "Personally, as you age it becomes difficult to read so I still prefer paperbacks but for the younger generation who is very enthusiastic about the prospect of a library in their palms, I would be all in for it. I did it for my grandniece." He told us with a slight nostalgic feel to it. When it comes to paperless assignments, he was in favour of those as well only because of the ecological damage that can be done due to paper. "Also the archiving is safer and much more long lasting than paper which is why I completely agree with what has happened with Mumbai university where they have adopted online evaluation of papers from last year.", he added.

There is this preconceived notion about IT students that they are amateurs without visions and no experience. To this statement, Aggy sir spoke about vision for college vs vision on a personal front. "As a student, when you are looking at vision for the college I would agree with that statement. And it's not just BSc(IT) students but any student of the college doesn't have a vision for the college because the college has its own vision." He explains, "Students need to have a vision beyond the institution which should definitely be career oriented."

Another misconception about IT students is that they lack good communication skills, we wanted to get his opinion on this as well. He firmly believes that every student should work upon their vocabulary and grammer, no matter which background they come from. When talking specifically about IT students, the language we learn is programming language which is very different from what we communicate in, he believes that this could maybe lead to hindrances when talking in a public forum. Hence he encourages IT students to work on their communication skills.

Lastly, we wanted to brush upon a review that sir had given the magazine team last year about how we should make B.I.T.M.A.P. into a journal instead of a magazine. "Magazines just state facts and lack analytical articles as narratives." Aggy sir hopes we include articles that come with a thorough analysis of its contents, especially based on historical incidences like why MS DOS is not used anymore. Such articles provide a better comprehension of the topic, he believes. "Hence, you should report historical analysis so that we can stand on the shoulders of history to see the future." He concluded his thoughts as well as the interview.

FOREWORD

Prof. Roy Thomas

Head of IT Department, B.Sc. IT

St Xavier's college is celebrating its sesquicentennial year. BSc.(IT) department is completing 12 years of its existence. BITMAP, our department magazine, is publishing its second edition. I would like to congratulate the entire magazine team for its contribution. The main purpose of our magazine is to connect past and present and at the same time provide a platform for our students to showcase their hidden talents.

BSc.(IT) department has achieved a lot in the past 11 years. Our students have moved from Mumbai to different parts of the world. The presence of our alumni exist in Google Inc, Apple Inc, TCS Inc, Infosys Ltd, Wipro Ltd, PWC Ltd, L&T InfoTech, Great place to work, Capgemini, Accenture, Deloitte and in many other reputed business houses. Many of our students have completed a masters degree from Mumbai, Australia, U.K., US, South Korea and many other parts of the world. Such achievement of our department is possible only due to the contributions of all the past and present faculty. In this context, I would like to mention our former coordinator, Dr. Jyoti Singh who lead our department from 2008 to 2016. Her contribution is remarkable and unforgettable. I also need to mention Prof Yuvaraj Waugh, Prof. Remaya Panicker, Prof. Karen Mansukhani, Prof. Rajen Chatterji and Prof. Shivaranjani Gudibanda with regard to their contribution towards the progress of our department.

During the first eight years , our department motto was to develop the skill of programming. But since last three years our main objective has been to develop in the area of Data sciences and Artificial intelligence. If you search on Google for the most demanding job in the 21st century, it will result in data sciences. Data scientists must have good knowledge of mathematics, statistics, databases, machine learning and big data. Data science covers a whole spectrum of data processing and not just the algorithmic or statistical aspects. In particular, data science covers data extraction, data integration, data transformation, data engineering and data visualization and machine learning. Machine learning is a term closely associated with data science. It refers to a broad class of methods that revolve around data modelling to algorithmically made predictions and identifying patterns in data. Artificial intelligence (AI) is an area of computer science that emphasizes upon the creation of intelligent machines that work and react like humans.

We believe that with the team work of staff and students in the coming years, our objective to explore the subject further and contribute more to it will be met.

CONTENTS

DATA AS FORM OF ENERGY

BY ASHISH DEORA

It is said that energy can neither be created nor destroyed, it just passes from one form to another. This means the sunlight which gets trapped in leaves of a plant translates into heart-beats of a newborn baby or the energy which is spent while clapping hands gets translated into the spirit which fuels determination of a soul to never give-up in life. The list goes long and more interesting with every example.

However, if one looks from a pure non-physics perspective, there are many processes where energy changes its form in magical ways. For example, when a teacher teaches a concept in class, some just listen to it, some understand it, some build on it while some use it to teach others (friends, parents, cousins, etc.) and yet all make notes from the lecture. From a pure physics perspective, it's just a translation of sound energy to mechanical energy – students using their hands to make notes. But from another perspective, the lecture has formed new connections in the brain of some students as knowledge which can in return be used to educate others as well as stay with them for a very long time.

This kind of translation of energy doesn't look linear; It's amplified at every interaction and appears to be a chain reaction. Does this mean that the old law of thermodynamics has been proven wrong? Not really. Till date, most of us have been ignoring a form of energy which is very significant in the evolution of life on earth and nature has created mysterious methods (DNA, RNA, etc.) of storing this energy.

Data is a form of energy which has shaped life on the blue planet. Whenever two bodies interact, Data is created and this data is present everywhere in the most unusual of forms. It's raining from all the direction and all of it hardly gets absorbed, for example, an infinite number of eyes can see a juggler playing with balls – however only a few really notice it for it to get registered in their sub-conscious mind in the form of some neural connections. Data can be converted into two forms – analog and digital. The size of just digital data is so much that we need an infinite capacity to store it. Around 90% of data which is stored today has been generated in last 2 years. Just imagine the volume of this which keeps expanding with every second of every minute of every interaction. And what are we doing with this? Humans, with the current percentage of active brain area, is not capable of parsing and processing such volume of information. Hence, we have come up with a field which combines Statistics, Computer Science and Anthropology into one – Artificial Intelligence(AI).

All the parsing and processing is being outsourced to bots, computer batch programs, and other representatives of AI. New smart adaptive algorithms are written every day to process the data and find patterns in it and draw crisp inferences.

But wait! Why are we doing this? What about all the sceptical opinions? Are we trying to duplicate ourselves? Or re we planning to let robots take over us? No, none of this is true. We are feeding data to AI which was never fed to Human brain till date. AI is only there to assist humans in matters which are above our calibre. What's in the womb of the future then?

As per Turing test, a true AI is an AI with which interaction sounds normal. The person interacting with AI should not feel that he/she is dealing with a non-human being. In the movie, "Ex-Machina" by Alex Garland, they show an experiment where a scientist creates an AI which easily cracks Turing Test. It also shows, how the AI evolves and develops feelings like love, sense of freedom, lust, etc. All these some to come from the data it has accumulated, hence making us question just how influential data can be.

To summarize, data is a form of energy which looks very promising. And the fate of our species will be decided by how wisely we use this expansive as well as magical source of energy.

Ashish Deora is an alumnus of B.Sc. IT Department, St. Xavier's College-Autonomous, Mumbai, Batch (2014). He started his career as operations analyst where he was handling survey operations of Great Place to Work.

He also got a chance to work on requirement gathering, testing and automation of survey platform to compiling and producing Global Lists of best workplaces from data of millions of employees and thousands of organizations.

Getting HACKED
MADE EASY
BY
you

"LET'S FACE IT! THE FUTURE IS NOW. WE ARE ALREADY LIVING IN A CYBER SOCIETY, SO WE NEED TO STOP IGNORING IT OR PRETENDING THAT IT IS NOT AFFECTING US"

— MARCO CIAPELLI

Imagine you are a bank robber and you have been planning for months to lay your hands on all the money in the bank. Finally, the day comes and you notice something very different. There is no security guard at the gate and all the CCTV's cameras are already dead. What a delight that will be for you isn't it? Eventually, the same happiness will be seen on the face of a Hacker because you were not careful regarding your security. Security is a very important aspect when it comes to being either a developer or an end user. In movies, hacking is all finesse, excitement and genius coding but in reality, it is like locking your house and giving its keys to someone else.

How safe are your passwords with websites?

Firstly if you use a password like password123 or test123 or 12345678 then please don't blame the hacker for any mischief. Passwords are like apples in a fictional garden. They are perfectly ripe and there for the taking if you know how. Websites never store passwords in plain text form. They store it in the form of "hashes". When you enter your password it is fed into a hashing algorithm and then a hash is formed. To explain you the concept of how

hashing algorithms work let us take an example of Facebook. Before signing in into Facebook you are required to fill a form that consists of your general details like email id, date of birth, gender, and your login password. When you click on sign up, this data is sent to Facebook's back-end database. In Facebook's database your name, gender, date of birth, and your email is stored directly but what about the password? Password will never be saved as plain text but instead in form of encrypted characters. The password will then be fed to a hashing algorithm which then will give you a set of encrypted characters which is then stored in the database. These characters appear to be random but they are not. There are many hashing algorithms like MD5, SHA 1, SHA 256, MD6 etc. Hashes look something like `ef749ff9a048bad0dd80807fc49e1c0d`. Now suppose Facebook had

gained access to all the data in the database. The hacker will now have access to name, date of birth, gender, and email id but what about the password? They will never be able to sign in into any specific user account because the password that they have is in an encrypted format and not plain text. If the hacker tries to use the hashed form has an input then that won't work because the input required is always in plain text format. The only way possible is to reverse the hash to its original form, but to reverse the hash with the hash alone is highly impossible. That's how hash-ing algorithms are designed. So what's next? Are your passwords safe?
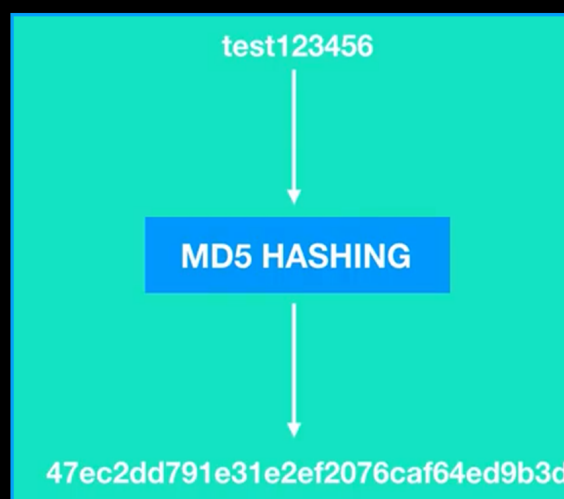

Frankly speaking no, in that case, the strength of the password comes into action. For e.g., If your password is very small or a very commonly used one then it can be cracked within seconds. There is something known as Rainbow tables. These rainbow tables contain very commonly used passwords both in its plain text form as well as its hashed form. If the hash already exists then this means that the password is successfully cracked and now we can sign in into the user's account. But what if the password used is not a commonly used one? In that case, there are several attacks used and the most commonly used ones are Brute Force attack and Dictionary attack. Brute Force attack is an attack wherein every possible combination is converted to its hashed form and then compared with the hashed password of the user. For your information, a computer can compare 350 billion password combinations every second. How common does your password feel now? But if the password is too long then it literally takes forever to crack. The Dictionary attack is an attack where the hacker prepares a wordlist file with loads of passwords. In this attack, the hacker writes a code which compares the password hash to be cracked with the password hash of each and every word that exists in the wordlist file. If any hash is matched then the password is successfully cracked. Now this attack can be target specific as well, which means that you can actually create a wordlist of your own provided you know some basic information of the target and he/she has used the same while framing the password. To make the matters worse for hackers the concept of SALTING is used by developers. In this technique, a specific combination of characters are sprinkled at specific parts of the plaintext password before hashing. Every company has its own salting algorithm and they never make it public. For example, say Facebook decides to place say string 'f&2p' at the start of every password entered. Then this combination is hashed and saved in the database. So when this concept is used rainbow tables are of no use. Even if the password is to be cracked is a very commonly used one because the hash of the password without salting will not

salting will not match the hash of the password with salting. Also, Dictionary attack and Brute Force attack are not effective to crack salted passwords unless the hacker already knows the salting algorithm. The most efficient way to overrule all the possible threats is to keep changing your password on monthly basis and use a unique password for every website. Always use an alphanumeric which is too long.

How can your system be hacked?

Clicking on known or unknown links that come on Whatsapp groups or on other social networking websites or while browsing the net can actually give complete access of your device to the attacker. You can actually lose all your sensitive data like images, contacts and so on. In worst cases, the attacker will install a Trojan in your system and everything that you do will be monitored. So next time when you install an app, please do read all the permissions before clicking on the agreement button because you never know what additional information that app might take from your device and if you have apps that you don't use very often then please disable it or uninstall it. Many a times organizationsuse your data to service you in the form of advertisements.[If you don't know what you're doing better always install from trusted sources Eg. Google Playstore]

The next place where you compromise on your security is while using public Wi-Fi. Free public Wi-Fi can be incredibly useful as you can connect to your friends, check messages and download maps and so on. But as an old saying goes "Everything that is free comes with a price". Never trust a public Wi-Fi and if it is free and unsecured, avoid it. Chances are it is not what it seems to be. In most of the cases, it is a trap. An attacker sets up a fake Wi-Fi hotspot in a very crowded place like subway, hotel, railway station, airports, cafes etc. The moment you connect to the hotspot thinking it is an ethical one, all your activities are monitored. If you login into your Facebook or Gmail or Amazon, your login id and password will be login id and password will be recorded. All your banking details can also be tracked. In hackers community, this attack is called has the "Man in the middle attack". As the name suggests attacker is the middleman between you and the server. So every packet you sent is intercepted by the attacker. To make the matters worse something known as 'PHISHING ATTACK' is used to snatch everything from you. For example, a fraudulent email is sent to the victim from the bank stating that his/her account has been accessed by someone and a link is provided in the email assuring him/her that necessary action will be taken. The victim in most cases panic and without any further investigation, click on the link. After clicking the link, the victim will be redirected to a webpage which pretends to be the bank's webpage (spoofed website). The moment login id and password is entered, this data is sent to the attacker and all your money is gone. If such emails come to you please don't follow these instructions blindly. Contact the organization as soon as possible.
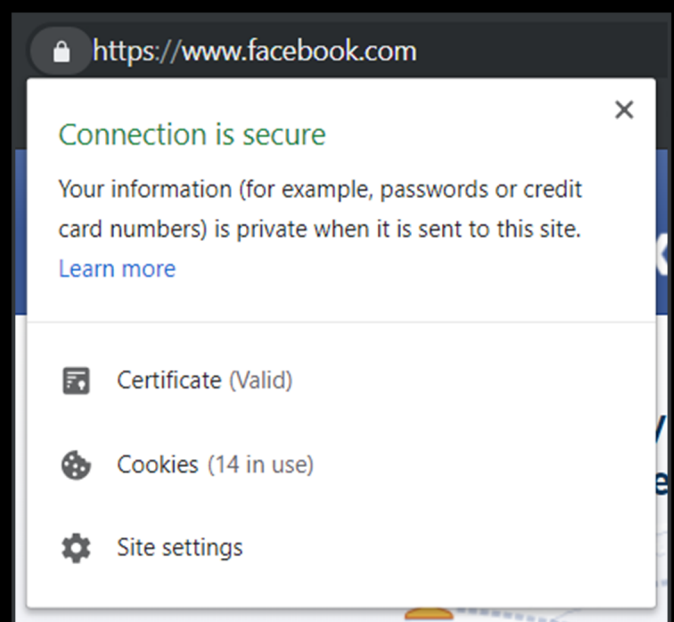
Preventive measures that can be taken when on a public Wi-Fi:

1. Avoid doing any banking or personal information transaction when you are public Wi-Fi
2. Check for secure connection by looking for https or a lock icon on the browser URL.
3. Keep your operating system and browser up to date when you are on secure connection rather doing it on public Wi-Fi.
4. Please check that you connect to a legitimate public Wi-Fi. Check with the organization who is the legitimate internet service provider.
5. You can also use a VPN (Virtual Private Network) while using public Wi-Fi. This will be sought to making a tunnel or encrypt your data between you and your server. By doing this the hacker cannot intercept your packages.
6. After you are done, please log off from all services and then forget the network.

Lastly, there are many other ways you are compromising on your security, please be alert always because you never know what's next?
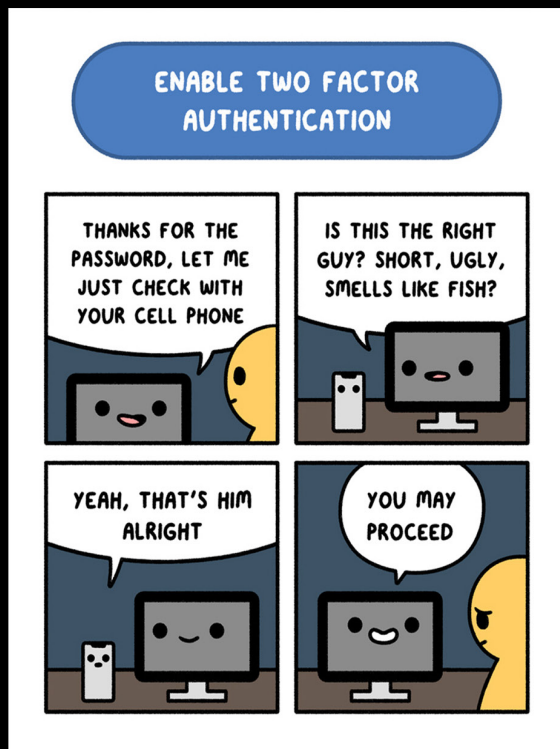
Ryan D'Cunha

TROLL ARMY

How VLADIMIR PUTIN won the U.S. Presidential Elections?

We've all heard of warfare on land, air and sea. Since ancient time there were such warfare and these wars had rules. Some were followed, some were not, and some were followed or broken based on convenience. The highlight of such warfare was that these were directly fought between the two or more conflicting parties. As time passed war began to deteriorate and became more and more chaotic with the complete abolishment of rules known as guerrilla warfare and then war begun to be fought by smaller parties on behalf of the larger party through instigation and manipulation. However, in these scenarios too there was some involvement from the conflicting parties, no matter how small. Now, with the rise of technology and the internet, we have entered a new era, the age of cyber warfare.

> **Donald J. Trump** @realDonaldTrump
>
> Thank you Putin, very cool!
>
> When you personally order an influence campaing to harm Clinton's chances and undermine public faith in the US democratic process and it works.
>
> HACKERMAN

There is no need to fight physically or have direct involvement anymore, you could topple entire governments and erect entirely new ones with a dozen people sitting in a small house in some 3rd tier city with a good internet speed. How is this possible? The answer is trolls or to be more specific the concept of a troll army and the art of manipulating and priming the general public through targeted advertising to change popular opinion. Although light hearted and completely harmless on the surface, on further analysis you will discover just how deep this rabbit hole goes.

Let us start by defining a troll. Urban Dictionary defines the word troll as "One who posts a deliberately provocative message to a newsgroup or message board with the intention of causing maximum disruption and argument". A troll army is a group of such people (or trolls) who look to spread fake news on the internet (especially social media platforms like Facebook, Twitter, Instagram, Snapchat, etc.) with a specific agenda in mind. Until a few years ago, these trolls, memes and fake news were dismissed as rubbish or mere jokes and a source of light entertainment however in the past few years we have come to see the potential of this troll army with the US Presidential Elections and to a great extent in our country as well.

Political Trolling and manipulation is an organised smokescreen to shut down contrary opinion and to distract people from real issues. Let's dive deeper into this topic by explaining two very big aspects of influencing the public. The first method we will call the black hat method (because of its illegality) and the second – the white hat method. The black hat method involves an IT cell or paid PR agency to start trends and spread the news across, this is called forced trending.

A Hierarchy is formed consisting of Shepard Accounts, Sheep-dog Accounts and Sheep Accounts. The Shepherds are highly followed verified accounts which start the hash tag, fake news or trend. The Sheep-dogs are influencers with many followers who spread the hash tags, fake news or respective trend they are trying to bring on. The Sheep Accounts are bots and/or fake accounts which relentlessly post and share the content to make it a trend. This then invariably makes its way to the eyes of unsuspecting targets like us who then believe the facts to be true and thus influence us and become popular opinion. This method was widely used in both the Indian General Elections and the American Presidential Elections. Whenever, undesired and unwanted 'real' news may come up during key times of the elections, similar contrary news slandering the opposition or praising the ruling party and dowsing the fires of the so-called 'real' news would coincidentally turn up. Now on to the white hat method, this although legal (so far) is by no means fair or clean. This method involves the recent Facebook scandal wherein information from social media platforms from the accounts of users were collected and then analysed to target and manipulate specific groups of people. A certain demographic of people would be shown a targeted ad which will be agreeable to them and the remaining would be shown another ad which would suit their liking. For the sake of simplicity, I have explained it using only two demographics, however, in reality; the demographics were broken down into various permutations and combinations of people based on colour, religion, state, city, sex, gender, preferences etc. On top of that, the ads would be altered based on data collected on a minute basis, changing ever so slightly based on audience interaction with the ad changing and being tested as many as 60,000 to 100,000 times per day.

SHEPARD accounts

SHEEP-DOG accounts

SHEEP accounts

YOU
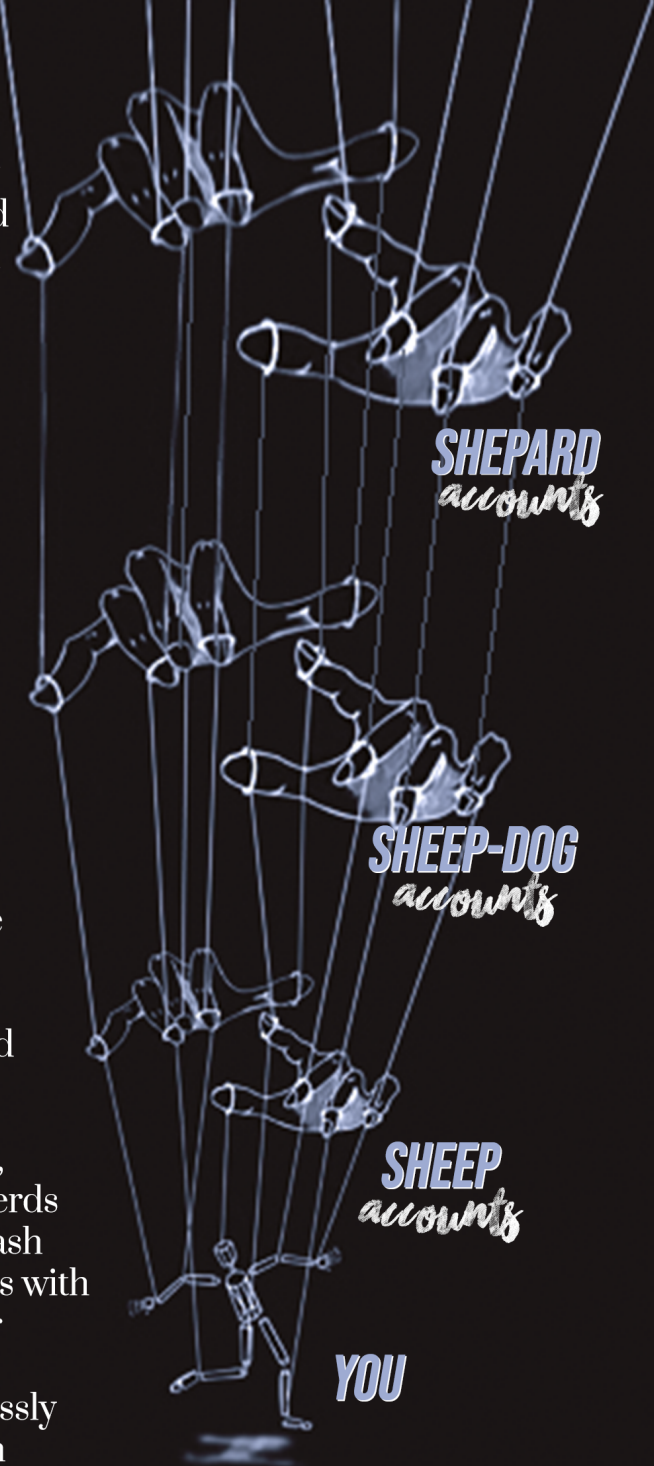
Let us take the example of Netflix. Netflix uses one of the most advanced algorithms to enhance user experience. Netflix shows each user a different thumbnail of the same movie based on their preference and past viewing history to increase the likelihood of the user watching that movie. For example, if a person A prefers romantic movies then Netflix would customize the artwork of the movie to one where the thumbnail would have the two leads in a romantic scene. On the other hand, if person B prefers comedy, then Netflix would customize the artwork of the same movie to one of Robin Williams, a well-known comedian. In this way, the odds of two very different people watching the same movie are increased. Whereas, if Netflix went with a one-size-fits-all approach the results would not have been the same. Similar tactics are used in politics as well.

Social media-specifically Twitter and Facebook-has played such an important role in Trump's upset win for the Presidency that even his digital director Brad Parscale had to give the social media a giant shout out.

"Facebook and Twitter were the reason we won this thing." - Brad Parscale

In January 2017, an assessment by the Office of the Director of National Intelligence (ODNI) stated that Russian leadership favoured presidential candidate Trump over Clinton, and that Russian president Vladimir Putin personally ordered an "influence campaign" to harm Clinton's chances and "undermine public faith in the US democratic process". Combining a 100 million US dollar budget on advertising campaigns along with troll farms operating from Russia during the US Presidential Elections allowed Trump to win the seat for Presidency. A similar trend has been going on in our country as well with the honourable Prime Minister Narendra Modi and his ruling party being one of the most active parties on social media in the history of Indian politics. Now, this is definitely not a bad thing! This helps the public feel more involved and a part of the governance.

Technology has helped us get closer as a nation. However, where do we draw the line? When we start voting based on our perception or liking for the party instead of actual policies then a line has been crossed. If our main source of news is social media where news is unfiltered, inaccurate and not written by experienced professionals then a line has been crossed. We must learn to use social media responsibly and we can do our part by not spreading fake news. If we absolutely must send a WhatsApp forward like a cyclone warning, threat, problem etc. then we should cross-check the facts on a local news source like the TV, newspaper, radio or Google before sending it across. As useful as big data and technology is, it is also a threat to our individuality and freedom as we are constantly being manipulated and primed to believe facts that are untrue and distorting our reality in the process.

NOTIFICATION ABUSE

EVERY DING COULD BE A

SOCIAL, SEXUAL, OR PROFESSIONAL
opportunity

REWARD CENTER OF THE BRAIN

answering THE DING OF A NOTIFICATION RESULTS IN A HIT OF **dopamine**

EACH HIT RECHARGES OUR ADDICTIVE COMPULSION.

→ SIMILAR TO CRACK, HEROIN, METH AND OTHER ABUSIVE SUBSTANCES

"Cumulatively, the effect is potent and hard to resist."
JUDITH DONATH -mit media scholar

It is in our hands to make sure that we use social media and technology responsibly and not take it as lightly as we did in the past. The Internet is here to stay, for better or for worse. Technology is great, it makes things easier and makes life more comfortable but technology is not everything and we should try and strike a balance between technology and nature, between being online and offline in our day to day lives.

Keanne
Dsouza

Who took away our drivers?

Ever since 1885, Karl Friedrich Benz, the person who invented the 1st ever Gasoline automobile, brought into existence the concept of DRIVERS.

A driver is a person who escorts his employer to the desired destination and on doing so is rewarded through a payment done by the employer. To think of a car without a driver back then would be a far-fetched fantasy for most automobile companies. However, the mention of a driverless car or an automated car in today's world seems just a few steps away from being accomplished. The driverless car uses just two main concepts viz. sensors and colour. The sensors help in detecting the proximity of another object be it a person, a dustbin, a footpath, another car etc. This is known to all of us, because that's the basic work of a sensor. The real and much more interesting question is, "How does a driverless car manage to stay in the correct lane and never deviate from its path while travelling at a high speed on the road even when there are sharp turns? The answer to this intriguing question would be the use of COLOUR. This is essential for carrying out such a project as the algorithm is rather complex which detects the lanes on the road so that the path of the car is fixed and will never deviate from it. However, this was the idea used in the early development of this project. Now, with the invention of GPS, sonar, radar, computer vision, Lidar and odometry it has become much easier to implement and carry out the project successfully. But the concept of using colour is still very prominent in the project.

Nancy Lockhart, global colour marketing manager for Axalta Coating Systems says, "When we test colours, we know that highly reflective colours (light colours) are more easily detectable by the Lidar systems." Why is this so? Why only light colours and not dark colours? The reason is fairly simple in a very complex algorithm!! To understand the algorithm, we need to know that every picture is made up of pixels that are stored in an array. So, a picture that is completely black

would have an array looking like so - [0,0,0,0] throughout the picture.
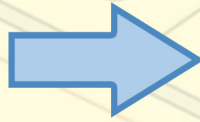
But, if we had white lines in the picture then the array wouldn't have [0,0,0,0] throughout the image. But it would look somewhat like the following-
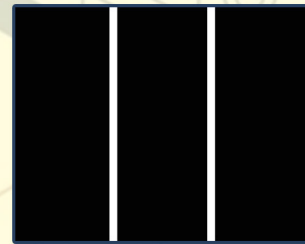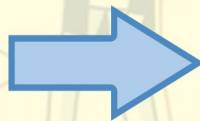

Here, to denote the colour black, 0 is used and to denote the colour white, 255 is used and hence we get the resultant image. With this knowledge in mind, let us now look at the algorithm.

Here's a brief idea of what happens in the algorithm in case of the colour -

1st   : The car is placed in the center of the road in between two lanes of white colour.

2nd : In the memory of the car it already has a masked image that's completely black.

3rd : There are two cameras placed on the vehicle at either ends to capture the image of the road ahead. After capturing the image, the algorithm performs a Gaussian Blur to the image.

4th : This image then goes through various processes to produce a Canny Image (makes the whole image into black and white lines, useful for edge detecting) which is then masked by the black image (which is already present in the cars memory) and a bitwise 'AND' operation is performed between the two images, to get the final image that will contain only the edges of the road ahead.

Now take for example the image in this case. The image sample on the left is with colour and is taken by the camer- as on the car. What if we had our car travelling on the 3rd lane of the road, to our right, we need the car not to change the lanes as it travels along the path. After capturing the image the it performs various operations to get the Canny image which is the image sample on the right.
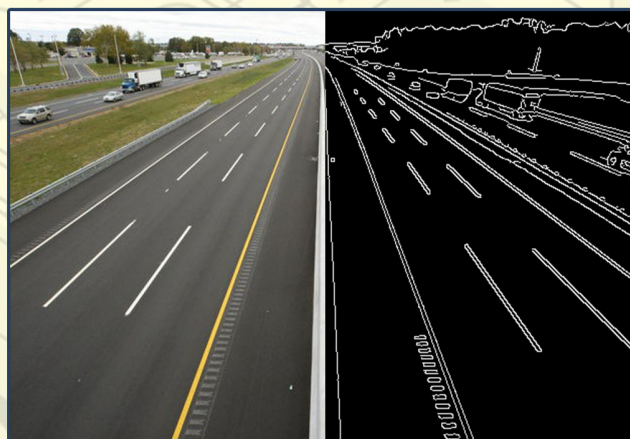
After this image is obtained the black image which is already present in the memory of the car is masked over this image and a bitwise AND operation is performed giving us the final image which contains only the edges of our road.

By following this process, the car can now "see" the road and make turns even while travelling and not deviate from the path specified. The following algorithm was first tested out in Japan in 1977, by Tsukuba Mechanical Engineering Laboratory. The vehicle tracked white street markers, which were interpreted by two cameras on the vehicle. So, from what we have just understood we can safely conclude that our drivers will now become useless. This will happen because of a few reasons:

1. The project guarantees a huge reduction in traffic collisions.
2. Enhanced mobility for the elderly and for the disabled people.
3. Lower fuel consumption.
4. Promises to decline the number of accidents that take place due to irrational driving.

Although the above reasons sound like an amazing solution to all of our current problems such as traffic congestion, over consumption of fuel, increased death rate due to road accidents etc. some may still put forth the question as to, why is such technology required in the first place?

And this question is something we all need to ask ourselves, because even this project has a certain number of drawbacks. In the context of reliability, there is just no telling when any software can go completely rogue and endanger us all. Speaking in context of driverless cars, if ever the technology for this were to go rogue then not only would the person sitting in the car be endangered but even the people on the street. A few of the drawbacks of this project may be as follows:

1. *Over-reliability on technology.*
   Example: If suddenly while driving the system fails then the whole batch of people present in the car are endangered and run the risk of losing their lives!
2. *Risk of losing privacy and security.*
   Example: If a hacker were to break into your car then there would be no stopping them as everything now is controlled by a computer. If you have set your destination and are ready to go, the hacker can suddenly make a change in your destination and you wouldn't know a thing of what just happened.
3. *Huge rise in unemployment.*
   There would be a huge rise in unemployment as many drivers would lose their jobs and land up on the streets of the country unemployed, which will sound the death-knell for the economy of any country.
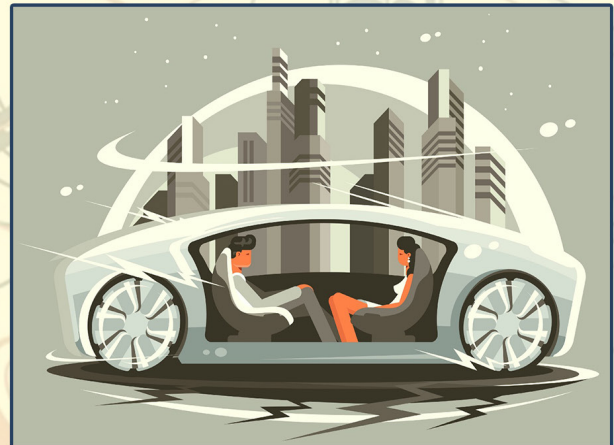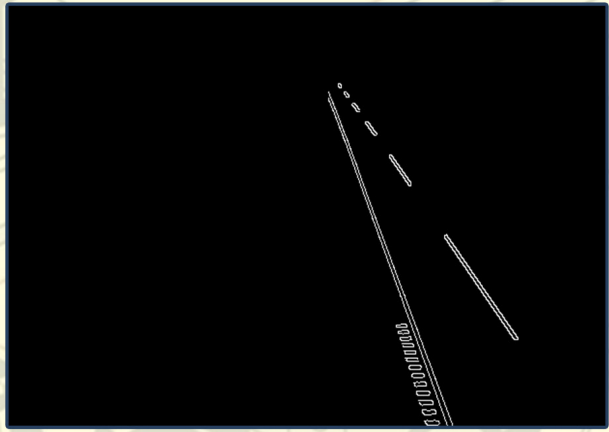
And similar problems would arise. If this were to happen then all the good things that the project promised it would do would mean nothing to us common people as we treasure our safety and security. At this moment I would like to quote Stan Lee, comic book writer, editor and publisher – "With great power, comes great responsibility". Technology must be developed in a manner that common man sees its progress as an ally and not as a threat to his job, life or even existence. It must be enjoyed and cherished, not hated and feared. It was never meant to progress by putting the common man's life at risk. It was developed to help the common man in completing and simplifying his day–to–day activities. As we go ahead in life, let us understand that every advancement in technology isn't necessary if it hurts the common man in any way. If there is an advancement, we should look and inspect it in a 360-degree manner as it should always be for the benefit of mankind.

Aaron
Gomes

begin with the end in mind

JACINTO MENDES

Studying abroad is usually not an easy decision, for most students. There are several factors to consider such as future opportunities, quality of education, cost, friends and even relationships!

For me, it was an easy decision because it was something I always wanted to do. Going abroad to study can be really exciting - being in a new place, making new friends, having new experiences, it can be really daunting for some, as you would be "out of your comfort zone" and is something you need to be able to come to terms with.

While the resources that are available to you online, and physically are massive - _think the st xaviers library times 3_ - the quality of education isn't necessarily the best. Depending on where (the university) you go, and what course you do - you might not be completely satisfied after your course! Personally, I like to believe that "you get what you pay for", that said, do look for scholarships/bursaries as that could help you financially.

Studying abroad also doesn't mean "happy days", it's not an easily life, depending on your background and life experiences - i had to learn to cook, and do all sorts of jobs on the side - I even became a bicycle mechanic!
While there are plenty of opportunities to socialize and meet people - ultimately it completely depends on what do "you" want and how "open" you are.

To me, to summarize my experience thus far, I would like to think of it as "a really long holiday, with a lot of hard work!"

I would like to end, this note with one of my favourite quotes by Stephen covey: "Begin with the end in mind"

Jacinto Mendes
(Deakin University, Australia)

Undergraduate and Graduate Studies in Canada

Since my graduation in 2014, I have had many opportunities to learn and grow not just as a professional but as a person as well. These opportunities have and had been presented to me not just because I was a St. Xavier's Autonomous College graduate but because of the quality of work that I and many of my classmates can and could produce. The rigorous training and meticulous amount of work that we had to do in order to gain that degree has prepared us for a lifelong of challenges that we continue to face to this day.

Although the Bachelor of Science in Information Technology degree is 3-year degree I learnt a lot of important concepts that I continue to use to this day. I believe the training we receive during the course is extensive and broad enough to help us decide where our interest lie in terms of what field of the industry we would like to pursue a career in.

However, that is not the same consideration that many North American Universities would make when you present your application for further studies. At most universities, you need a 4-year undergraduate degree as a minimum qualification for graduate studies. Some universities may require you to have an Honors degree but that is only in the case of thesis-based graduate studies.

To overcome this lack of 1-year of undergraduate studies I applied to the fast track program at the University of Windsor called Bachelor of Computer Science in Applied Computing for University Grads. It is an extensive program which requires you to complete 25 courses which would take about 1.5 years to complete. Unlike the course structure that is followed by most Universities in India, in America generally, you pick the courses you would like to take for a particular term/semester.

Thus, in a term could pick anywhere from 1 – 6 courses. 1- 3 courses would deem you as a part-time student while 4 and above would deem you as a full-time student. 5 is the prescribed number of courses to take per term. However, if you have an average of above 85% you can take an overload of 1 more course and pack your term with 6 courses which is something I'm currently doing.

These 25 courses can be taken at your own pace but one must be aware that each course is dependent on certain other courses and hence proper planning of which course to take in per semester is quite essential. The freedom of picking your courses is good as well as bad. When I mentioned I am currently taking 6 courses I was talking about the good aspect of this freedom. As I was allowed to take 6 courses I can now graduate next term as I have just 5 more courses to go!

On the bad side, you need to spend numerous number of hours planning which courses appear most frequently in which term (Fall, Winter, and Summer) based on past timetables of the University. However, there are many faculty advisors available on campus who can help you pick and plan the courses in a proper format so that you can plan your path to graduation the way I did.

During my research about graduate programs I found some interesting facts and tips that I would to share with you today. As an IT student with 3-years of work experience in the field as a full stack developer, the obvious field of graduate studies for me was and is the MSc in Information Technology or MSc in Computer Science. However, at most universities you will find only two types of graduate programs:

1.   Master of Science in Computer Science (Thesis/Course/Project-based)
2.   Master of Science in Applied Computing

The MSc in CS with thesis-based option is offered by many universities. A few of them offer course and project based as well. However, very few universities offer the Applied Computing option. Based on my research the MSc thesis/course/project based is generally meant for students who would like to gain more depth wise knowledge in a particular field. For in-

stance, I am very interested in Artificial Intelligence and hence for me, the wise choice would be to pick the MSc thesis or project based option and dive into learning more about Artificial Intelligence exclusively. Thus, I would not have to worry about learning other courses that I may not have much interest in. For this program, you are assigned to a professor's team and the professor will outline the courses you need take in order to gain more knowledge about the field that is interesting to you.

The Applied Computing specialization, on the other hand, is meant for anyone who is interested in gaining a broad amount of concepts which includes practically all fields of Computer Science. Thus, this specialization is more inclined to students with an Information Technology background as we have already been trained and have learnt concepts from multiple fields of Computer Science. Unlike the thesis/course/project-based option, you can study a breadth of courses that have already been planned out for you. You do have some elective courses that you can choose but they are generally not as emphasized as the courses required by your program.

The details I've mentioned above is just the brief amount of information I have gathered over the 1 year I have studied here in Canada at the University of Windsor. I hope this is helpful for anyone who wishes to pursue their graduate studies here in Canada.

Johan Fernandes

INTERNSHIP

GOAL   SKILLS   KNOWLEDGE   MENTORING   PRACTICE   OPPORTUNITY   TRAINING
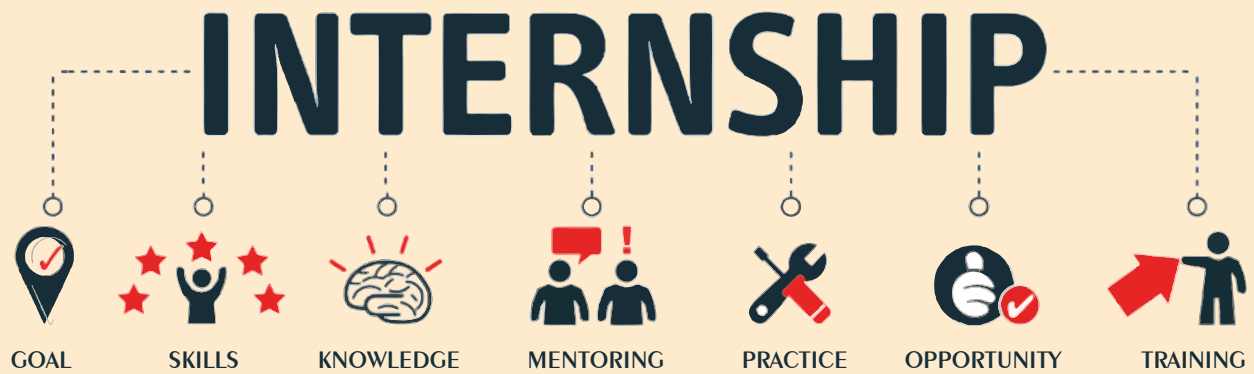
At St. Xavier's college, every student is advised and encouraged to take up internship at the end of semester 4. Towards the end of the Diwali break, while waiting for the 4th semester to begin, somewhere in the mind of each second year student lies an idea about what we are going to do in the upcoming summer break. While some students of my batch had planned to enjoy the vacations with their family, some planned to go for trips and some decided to do an internship, I picked the latter idea of doing an internship. Mid-way during semester 4, having got a brief idea from our HOD, Prof. Roy Thomas, on how to go about for internship, we were encouraged to pursue it.So, I registered with the college placement cell along with various websites offering internships from various companies.

Post the semester 4 end-semester exams, I got an opportunity to do an internship with Camp K12, as Asst. Technical Intern/Junior Instructor for Website and Android Application-Development. The experience I gained and skills that I acquired were:
- A feel of working in the corporate world,
-      Application of knowledge that I have gained during the second year of BSc IT, and
-      The ability to speak with confidence to people(such as students, colleagues, senior instructors, etc.) in a professional setting.

During the internship, even though having the required knowledge of the subjects, I realised that there was still so much more scope to gain in-depth knowledge of the subjects. I was now playing the role of an instructor and not of a student.

INTERNSHIP

A week before the internship starts, a senior instructor brushed up the concepts, introduced the new elements required for both the subjects and the learning resource material was shared for Android App Development, "MIT App Inventor" to develop the basic android apps and the site would help the students whom we would teach to learn and understand the concept, logic and its application in order to construct an android app.

It is rightly said that the proof of the pudding is in eating it so after completing an internship I can share with my juniors, that an internship gives you the feel of working while you are still a student, preparing to step out into the real world for job. It gives one the opportunity to grow and learn, and also gives a better idea on how much is expected out of interns of professional responsibilities before making the transition from campus to corporate.

Teaching students(from Std. V to Std. VII) not only enhanced my skills in the subject but also boosted my confidence. It also made me realise the amount of effort our faculty of BSc IT has to put in, to teach us in a manner that enables us to understand the concepts well.

- by Sonu Varghese

Studying tips

Coming into college can be very intimidating. The step up in academics from junior college or school can initially be challenging, especially when one doesn't know what to expect. For these reasons, in the first year, I was uncharacteristically serious. I sat in the front, patiently listening but aggressively writing everything that was being taught in my notebook. As semesters went on, I realized the more attention I paid in class, the less notes I needed to make. I shifted from using a notebook for my notes to maintaining a folder with sheets for each subject, which helped me reduce the amount of effort I had to put in.

In the beginning of each semester, it's very important to categorize the subjects you have. Categories could be subjects you enjoy or have done before and subjects that are purely numerical or purely theoretical. This should help ascertain how much time and effort you'd need to put in to each subject. Lastly, for theoretical subjects always make sure you get PPTs in class. I'd often just take the PPTs, delete slides I marked as unimportant and then converted the entire PPT into a single document for memorizing by using acronyms as a mnemonic device.

Simply paying attention in class and understanding concepts is enough in my opinion. There is a lot of material on the internet to help one simplify and understand these concepts as well. Once you feel the gist of the concept is somewhere in the back of your brain, you can pretty much sail through the semester while having ample time for SIP, fests and any other extra-curricular activities. Usually, the week before exams, I'd finish compiling my notes into a document that was as concise as possible (my largest one in TY was 6 pages with diagrams and everything). Since I'd already understood the concepts, the day before the exam was often spent just memorizing the details from these sheets. This enabled me to do 3 revisions and even watch the midnight champions league games, provided I got enough sleep through the day.

CGPA - 3.86

APURVA AGARWAL

It is often said you must remember who you want to be, but sometimes it's more important to remember who you are and where you come from. The moment you feel that it's enough, that you can't go on anymore, is the moment you should recall all the efforts it took for you to reach here and that will never let your motivation fade away.

Forget about what others think or speak of you, it is not important as long as you know your end goal and are dedicated towards it. This however does not mean that you disregard other people's opinions; accept criticism in a healthy way and try to improve on your mistakes.

The key to good grades involves more than just rote learning, in fact your attention in the classroom plays an essential role. Keep up with the lectures even if you do not study everyday but make sure you put in your best efforts whenever you get down to studying. Studying is not about mugging and scoring well in exams but educating oneself and St. Xavier's college provides the best opportunities for you to do so.

Scheduling your studies well before hand is another key principle that will help you in preparing for your exams and ultimately, to achieve your goals. Believe in yourself and don't worry about the results.

Adequate amounts of sleep, extra-curricular activities, hobbies and exercise helps in maintaining a positive mental attitude which increases your productivity. You choose who you are and who you want to be, so dedicate yourself to not just achieving your goals but also becoming a better and responsible person.

CGPA - 3.88

AVINASH VERMA

Time never waits for anyone. It is the most valuable resource at our disposal but unfortunately, is misused by many in the hopes (hope) that a miracle will turn their lives around and compel them to work harder. We, as humans, put in the least effort and hope to derive the best results from it, which as we know would never happen. Yet, we waste a good chunk of our time engaging ourselves in non-productive activities, piling up all our work and then losing our minds trying to finish it before deadlines.

It is high time that we students aim to be proactive in life. College is a time for us to mature, think rationally and understand the idea of skepticism. This is the time for us to overcome the habits of procrastination and constantly work upon ourselves for achieving the same. After all, when it comes to performing well in one's subjects, all that we need to do is be attentive in class, keep up with the lectures, plan our work and our studies beforehand and execute the plan as efficiently as we can. One can aim for quality over quantity, studying effectively for short durations rather than long hours of dragging on simple and easy tasks. Working along these lines will definitely guarantee you a good CGPA. Enjoy your college life but also learn to balance it out with your studies.

In the end, all I would like to say is that this is your time to choose: to change your old ways for a better future or take things lightly and partially ruin not just your goals but also your mental and physical health.

CGPA - 3.84

The thought of trying every possible combination to a rubik's cube has occurred to all of us at least once while trying to solve a cube. Although this may seem impossible for a human to do since there are 43 quintillion combinations to a 3x3 rubick's cube, our rubik's cube solution generation algorithms does exactly that. Then again, 43 quintillion is a really big number even for a computer. even the besti7 machines wont be able to find a direct solution just by merely generating combination of moves and trying it out. Our algorithm significantly reduces the number of combinations, by generating sequence of moves of length 3. This gives the algorithm 4000+ moves to choose from and instead of solving the entire cube in 1 go we used the concept of happiness function which gives a happiness value to every state of a cube. So when the program has to decide what sequence of moves to do it will select the one which has the highest happiness value and then it reiterates to find even better happiness and eventually finding the solution. The happiness function rules have been coded using the fridrich methodof solving the cube. The algorithm is a utility based agent that does not have a static set of conditionsthat it has to follow.

PROJECT

cosmetic website

Team Details

Naina Bhasker (UID - 155044)   Nisha Maria Shaji (UID - 155004)

Project Details

Under the guidance of Professor Lydia Fernandes we have been able to design and program Harmony, a website for a virtual company called 'ShopLoop'. ShopLoop is Cosmetics brand which produces and sells various cosmetic products. Harmony is an online platform created for the ease of online shopping for the users. The users can use various filters while searching for their desired products. Users get a discount on products which are available at brick and mortar shops. This website also provides the users with multiple modes of payment.

Harmony has postgres as the database, servlets as the backend technology and it uses a Type 4 JDBC driver. We developed the project module-wise. The three modules in the website: Login and Viewing, Payment Gateway and Admin Module. The 'Login and Viewing' module has the login and registration page where the user can log in and view the products. If it's the user's first time on the website, he or she can register as a new user, log in and then continue viewing and purchasing products. We have added a mechanism to reset password using a link sent to the user's email id or phone number. The website has a functionality of 'Filter' which lets the user add specifications for an efficient search. The 'Payment Gateway' module has. A functionality has been added to the text fields which disables the browser's back button, copy, cut and paste actions. It does not allow the user to right click during the transaction. Multiple modes of payment are made available to the user- Credit Card, Debit Card, Net Banking, Cash on Delivery (CoD) and Gift Cards (issued by the company).

For the employees of the company who do not work with SQL directly, this website offers an interface which allows the employees with admin credentials to view and edit the existing records (add new records, update or delete existing records).

The payment gateway is a dummy one. We made bank and card association databases. After the developers leave, the company employees may or may not know SQL. So, we made an interface which allows only the individual with admin credentials to add new records, update and delete existing records.

Client-side validation is in place. The issue was to update/insert images. Since we were storing just the image path in the database to make it faster, this was tricky. The form where the admin would upload the image had the enctype as 'multipart/form-data'. The images were stored in the server's metadata. So, we changed the directory to be saved in to the location where all other images are stored. It would be replaced if there was already an image with the same name. That way, we never had to change the image path in the table. We made special java classes for database connection. So that it handles more hits and is more secure.

Advantages
· Helps to choose products faster, easier and efficiently from one place.
· Will help the customer to virtually try out the product before buying.
· Greater variations of products.
· The website is stable even in mobile version(bootstrap).

Limitations
· No mechanism for return/refund/replace the product. Another update to be added wherein if not satisfied the customer can either return or replace or demand a refund.
· No SEO as of now. So, lesser scope.
· Tracking your product will surely be added as soon as we add an update for return/replace/refund.
· User ratings and reviews too will be soon added.

Scope
In the proposed system we intend to add on a feature for trying out the product on a sample photograph which will be chosen by the buyer from her/his gallery. We also add on a mechanism where if bought products over 1000/- we give a discount of 10%.

Target Audience
· Women.
· Men and Women who wish to gift.
· Beauty Parlours.

PROJECT

labyrinth solver

Team Details

Bryce Fernandes (155022)   Joben Coutinho (155091)

The Labyrinth Solver, is a 4-wheeled bot which can navigate across a labyrinth autonomously and can be manually controlled by a user with the help of an Android smartphone app. The bot contains 3 ultrasonic sensors (placed in the front, left and right of the bot) which measures the distance between the objects and the car. Using the sensors, it can determine which path the bot should move.

It can often be confusing to tell a maze and a labyrinth apart. Both look similar and have the same purpose, which is to fascinate someone with their twisty and complex pathways. However, they are somewhat different.

Both a maze and a labyrinth involve a network of paths and passages through which one must find a way. However, the primarily difference between them is the fact that a maze is multicursal (contains multiple paths to the exit), whereas a labyrinth is unicursal (has a single path).
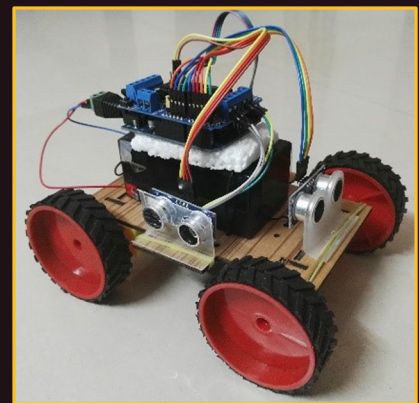
Labyrinth

Maze

Composition

The Arduino board is the main component of the bot. It acts like a CPU where all the other components are connected. It contains the program to run the bot.

The motor shield is an added feature which helps in regulating the voltage flow of the motors. It is placed onto the Arduino board.

The three ultrasonic sensors, also known as transceivers, are connected to the Arduino board. They work on the principle of a radar/ sonar (can send as well as receive data). They send a high frequency sound pulse and receive an echo of the pulse after it bounces off an object. By calculating the time interval between sending the signal and receiving the echo, the sensors determine the distance of the bot from an object.

A DC motor converts electrical energy into mechanical energy. The DC motor used here follows a concept known as gear reduction where the gears in the motors reduce the speed of the vehicle but increase its torque.

The Chassis is the base which holds all parts of the bot together. They are basically built with easy to work materials such as Plastic, Metal sheets, or Glass (in some cases). Here we are using a wooden chassis as it is cheap & lightweight. The chassis comes with brackets for the dc motors which can be screwed in.

The bot is powered by a 12 Volt rechargeable Lead Acid battery. It is placed onto the chassis and connected to the Arduino board.

The wheels are attached to the DC motors which are bi-directional. The bot contains 4 wheels which offers best traction over off-road conditions and rough terrains such as sand or snow. A Bluetooth module is added to control the
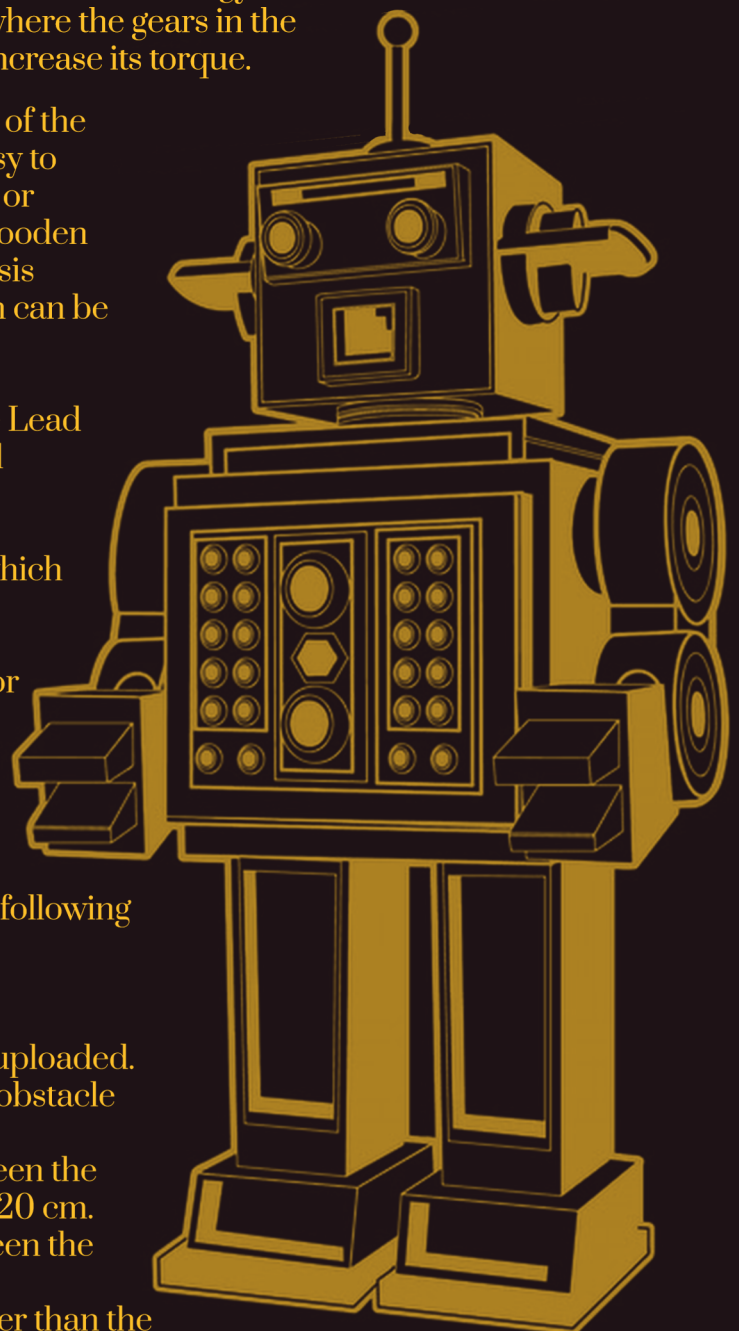
Algorithm

To navigate the labyrinth, the bot follows the following algorithm:

1. The bot is switched on.
2. The Arduino board runs the code that is uploaded.
3. The sensors measure the distance of the obstacle from the bot.
4. The program checks if the distance between the obstacle and the front sensor is less than 20 cm.
   a) If true, it compares the distance between the obstacle and the other sensors.
   b) If the distance from left sensor is greater than the

distance from the right sensor, the program turns the bot 90 degrees anti-clockwise (towards the left).

c) If the distance from right sensor is greater than the distance from the left sensor, the program turns the bot 90 degrees clockwise (towards the right).

d) If the distance from right sensor is equal to the distance from the left sensor, the program turns the bot 180 degrees clockwise (takes a U-turn).

5. If there is no obstacle ahead (i.e. the distance from the front sensor is greater than 20 cm), the bot moves forward for a second and repeats step 3.

6. This process repeats until the bot is turned off.
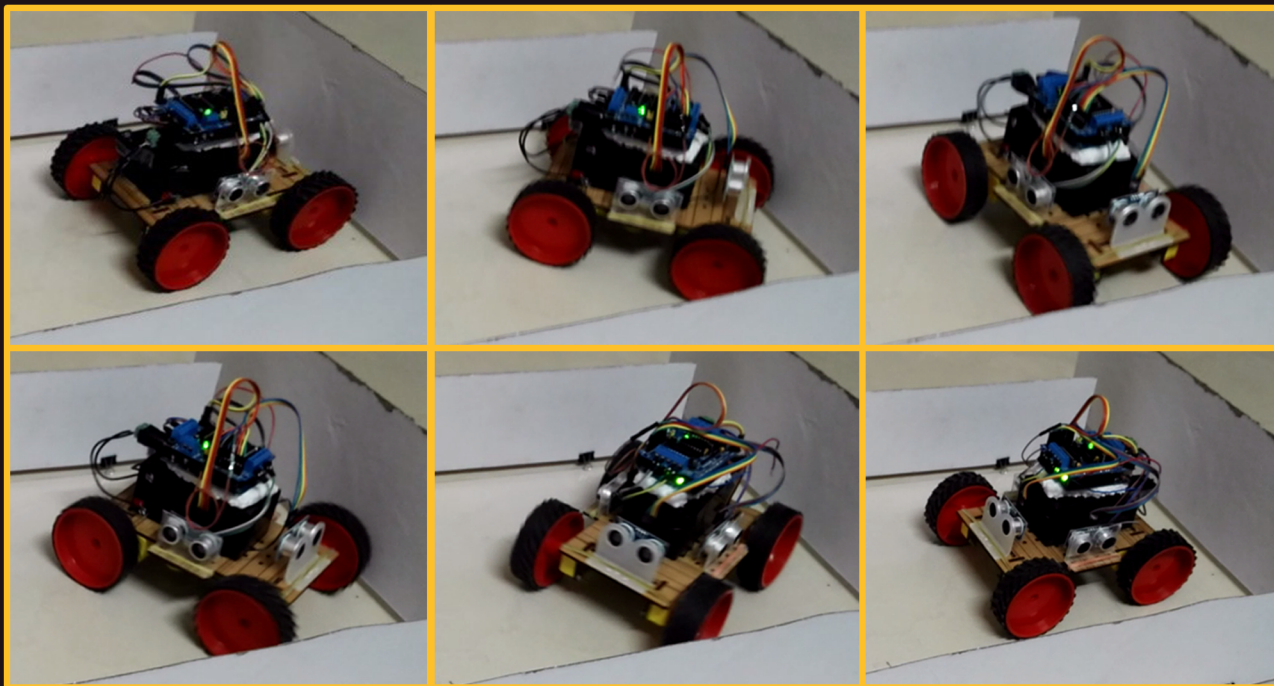
To avoid any miscalculations while turning, the conditions for checking the distance are given ranges.

The App

To control the bot manually, we use an Android app. Android is a Linux-based operating system designed primarily for touchscreen mobile devices such as smartphones and tablet computers. To create the app, we have used Android Studio which provides the fastest tools for building apps on every type of Android device. Some of the features of Android Studio are code editing, debugging, performance tooling, a flexible build system, and an instant build or deploy system. The Android app contains 5 buttons – one to enable Bluetooth and pair the device to the bot and the other four to control the movements of the car. We upload a specific code to the bot which helps it communicate with the app through Bluetooth. The app takes input data in the form of bytes and the Arduino board receives the bytes and moves the bot accordingly. For example, as the user touches the forward button on the app it sends a stream of inputs of 1. The bot receives and reads the input bytes and checks if it is 1 and turns the motors

forward. When the user doesn't press any buttons, it sends a default input i.e. 0, the Arduino board reads the inputs, it stops the current flowing through all the motors thus stopping the bot.

Future scope

Can the bot be programmed to solve a maze? Yes, but to solve a maze efficiently it should use artificial intelligence to determine the shortest and optimized path to take from the start to the goal. The basic solution is to follow the left-hand rule algorithm. The rule says if you are stuck or lost in a maze, keep either your left or right hand towards the boundary and move forward. Although this is the longer way, you would eventually reach the end. To implement this on the bot it must check if there is a left wall with the left sensor. If there isn't, the bot turns 90 degrees to the left and checks again. If there is a left wall, it checks if there is a wall in the front with the front sensor. If there isn't, the bot moves forward. If there is a front wall, it checks if there is a wall on the right of the right sensor. If there isn't, the bot turns 90 degrees to the right. If there is a right wall, the bot takes a U-turn since all three sides are blocked.

The Labyrinth Solver is a type of unmanned ground vehicle. One of the potential uses of it is in the field of agricultural farming, using the bot and soil sensors, it can navigate across the field and collect data of the quality and moisture content present in the soil. Using this data, it can provide a map of the areas requiring irrigation and thus preventing any loss of crops.

Using sensors and additional integrated components, unmanned ground vehicles can be used for search and rescue purposes, cave explorations, detailed study of the environment, etc.

PROJECT

PUKAAR: The E-NEWSLETTER

The Team

Ashly Johnson, Shivangi Kaushik, Lyra Pinto & Sara Correia

The Task: making an e-newsletter

PUKAAR

the Jagruti Newsletter

Pukaar- the Jagruti Newsletter, was an opportunity given to us by Prof. Lydia Fernandes, so that we can use our knowledge and skills, learnt in the classroom, to understand the challenges involved in website development in the real world. She not only supported us but also helped us at every stage. We followed the Software development life cycle that we learnt as part of our software engineering course.

Communication Phase

During the process of website development, it is important to gather information by arranging meetings to get a clear understanding of the client's requirements and while gathering information it is important to cover the right topics to get the sufficient information.

The Planning Phase

Website designing seems easy until you are working hands on in real world environment, unlike the computer lab, where everything goes step by step according to the client's requirements.

Modeling Phase

Topics like layout designing, features for website, colour topology, fonts etc. Based on the information gathered proper planning and discussion with teammates is important. A site map, flowchart and rough layout is created which gives a General understanding of how the website will look and work.

Construction Phase

The client reviews the design and feedbacks are welcomed. Coding is started by using all the information gathered and plans made. Proper use of Technology plays an important role. For pukaar website 'Brackets and notepad ++' was used as the text editor. Using the flowchart, coding is implemented. Testing during the coding is important. The website should be user friendly not only on desktop but also on mobiles and tabs so, it is important to go for a responsive design. When the whole website is ready, testing is very important, like the flow of website should be smooth, running the website in different browsers, checking the website on different sizes of screens, loading time should be very less etc.

Deployment Phase

The website is shown to the client and by their approval, process for hosting should start. For Pukaar, Google firebase was used for hosting.

Our Experience working as a team for developing the website for our junior college program Pukaar was amazing. We Thank our professors of the BSc IT Department for their guidance and support.

"

This summer, we put up an online newsletter for the Jagruti programme. A few BScIT students helped us create it. This is our testimony for their work.

In the summer of 2018, the junior college Jagruti programme was on its way to getting its own online newsletter. The website for this was created by the IT department. The team we worked with consisted of four TYBScIT students –

The Team

From the beginning, they were very co-operative with all our needs, willing to come to college in the vacation if we wanted, being patient with us and explaining how certain things would be created and making sure to understand exactly what we wanted from the website. Besides this, they also gave us their own inputs, and didn't hesitate to disagree with us if they felt that our ideas wouldn't work. This, we greatly appreciated. The work for the website was quite a lot and there was a lot of content, but they still

managed to put it up before college re-opened. Interacting with them was easy. They were really cooperative and helped us whenever we needed to make any changes or modifications (which happened very frequently). They also taught us how we could edit the website and upload new content, which was fun to learn, and left us in awe of their abilities. It was only when we saw all the programming and coding that went into creating the website that we truly appreciated their skills. We had an amazing experience working with them, and are extremely grateful to them for all their efforts.

Feedback By

Farishta Anjirbag and Bhakti Chaudhari
[SYJC Arts]

जागृति – एक एहसास

झिलमिल सितारों से जैसे सजी थी वो रंगीन शाम!
उमंग, उत्साह के साथ जीवन का था पैगाम!
आत्मपरीक्षण ने सँवारा उन हसीन लम्हो को...
खुद को भुलाकर खुद ही को मिलने का था अंजाम!

किलकारियों की गूंज से थिरकने लगी धड़कन!
प्रेम की भावना से खिल उठी रूह मन ही मन!
नयी उल्हास के साथ जीवन का हुआ नया उदय..
मासुमियत की डोर से रच लिया हमारे मन का दरपण!!

सब ने मिलकर बनाया एक अफ़साना..
सब ने मिलकर पुकारा स्वयं को..
हो गए मन के सारे दुःख रवाना..
उजागर किया खुशियों की ज्योत को..

एक पल का एहसास था वो..
एक आलम अनोखा सा था वो..
रात में जुगनु की रोशनी थी जैसे...
एक लम्हा जागृती का था वो!

पुकार
the Jagruti newsletter

HOME   ABOUT   ART   JAGRUTI जन   EVENTS

ANNOUNCEMENTS

JUNE 2018

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

* "JOY OF SELF-DISCOVERY" New
Camp at Dahanu

Railway Reservation

Railway Reservation System is a Web Portal with 2 modules :

1........... Passenger Module
2.......... Admin Module

This provides the passenger with ease of ticket booking from anywhere, anytime in less than a hour. Technologies used are: JSTL, Servlet, JSP, Restful, MySQL, Android, ZXing, ItextPDF, GeoNames, Google Maps, Some Other Common Jar Files for Mail etc.

Demonstrated via 3 Laptops with Passenger Login, Admin Login, Payment Gateway, etc. and 2 Android Application for QR Scanner and Location Tracker. And tables used in this Project are 48 Tables in total.

A Wrong Username alert box is triggered if the username credentials don't coincide with the database entries.
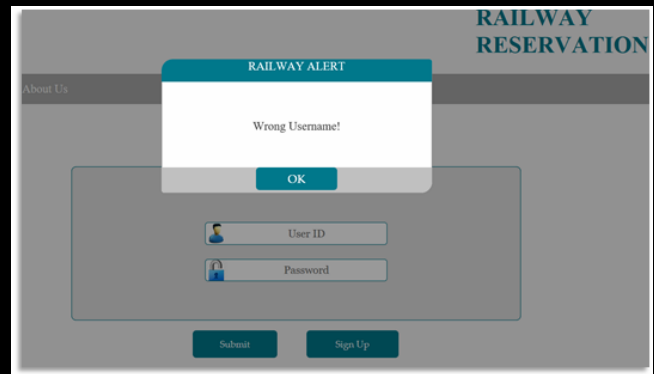
The **Registration Page** with a Strong validation check.

The **Index** Page where the Passenger has to Login is shown below. The Logo, Alert Box, Modal Box and designing of the Portal is self created instead of using Default.

"User Id exists", real time error pop-up for already present user id in the database

A 3-Tier Authentication System : **Email Verifi-cation,One-time Password check and captcha check.** State and District Information is obtained through the web **service GeoNames.**

Above, the Source - Destination expected distance and time duration.

Class Selection Page: The coaches available for the selected train.

View Details Page: Displays the Trains according to the date, source, and destination. The **Search algorithm u**ses routes, the day of the train's journey(date-to-day conversion), source and destination on that route and duplication of the train (train returns to source). The bounds in the date field are up to 4 months from the selected date/day.

The Seat Map shows the Seating arrangements for the particular coach Selected.

Quota Details Page displays general information of the Quotas(9 considered here) in the Railway Reservation System with the Tatkal Quota (only 1 day before departure).
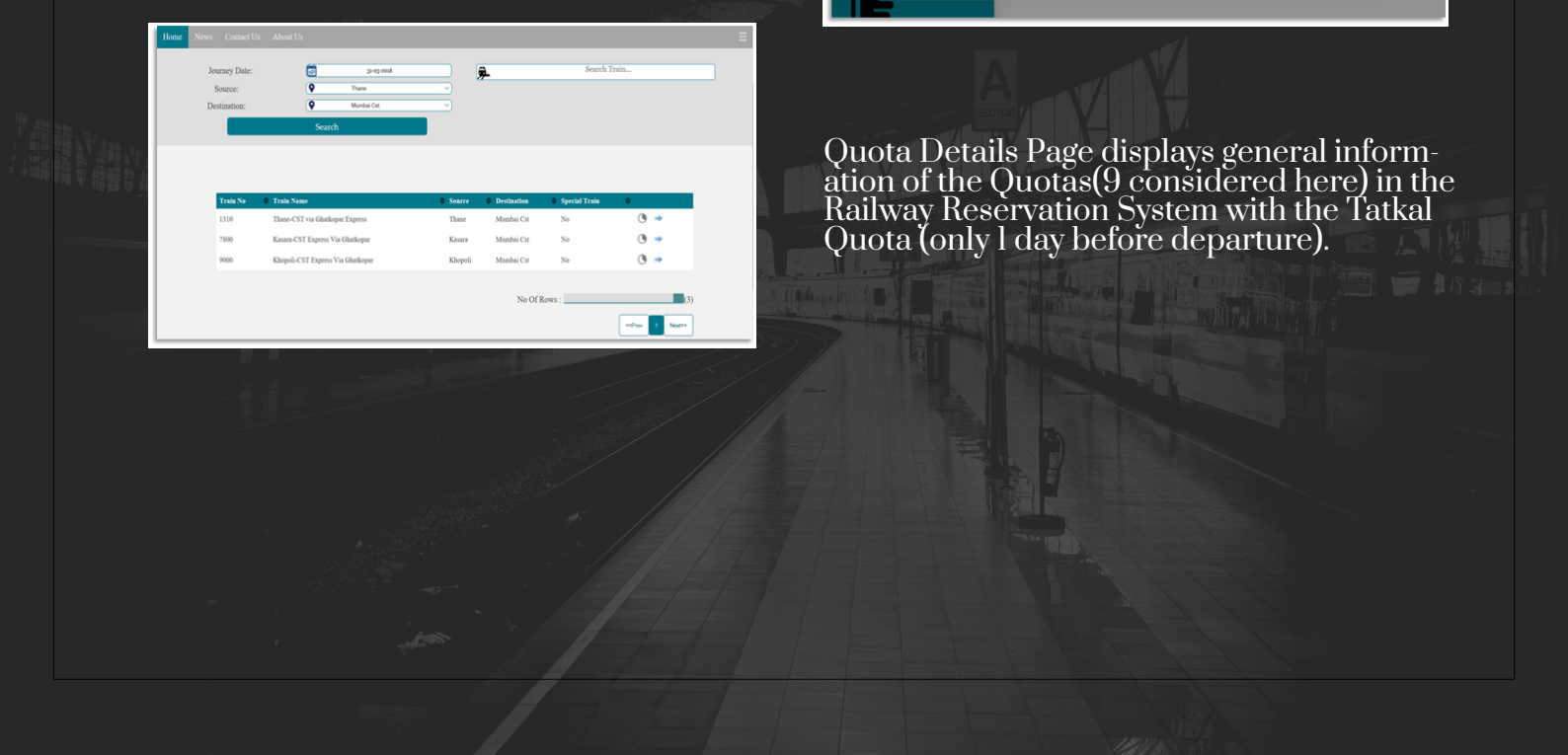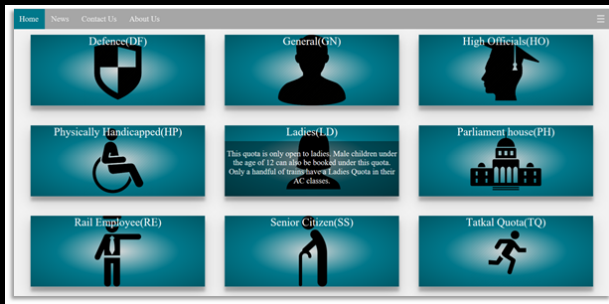
Seat Availability Page: The available seats according to the coach, quota, class and calculates the price and also displays a real-time chart (No page refresh required) Bulk Passenger Allocation Tests were written and performed.

Booking Page: A form to insert corresponding credentials of accompanying passengers. Prices calculated and displayed based on the Parameters of- No of passengers, Quota and Class.
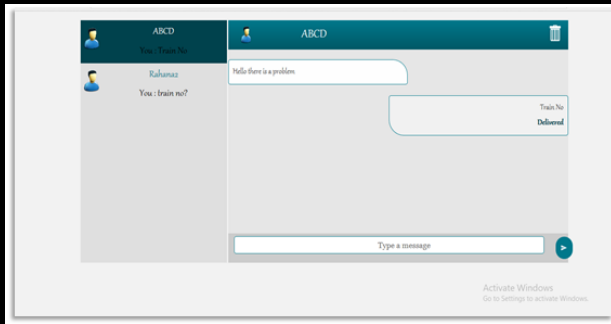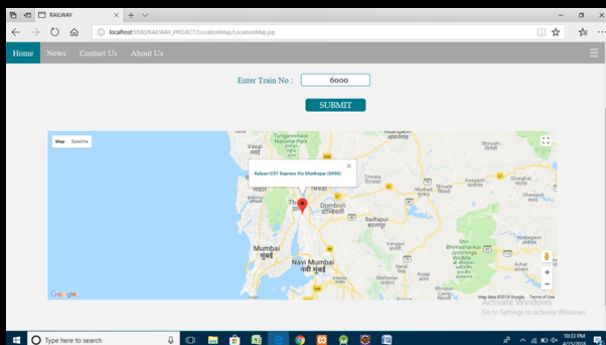

QUOTA	AVAILABLE CONFIRM TICKETS	AVAILABLE RAC TICKETS	AVAILABLE WAITING TICKETS	GROSS PRICE (AFTER DISCOUNT)
GENERAL(GN)	110	48	40	₹ 1,892.4 (0%)
TATKAL QUOTA(TQ)	33	0	10	₹ 3,784.8 (-100%)
SENIOR CITIZEN(SS)	8	48	40	₹ 1,703.2 (10%)
LADIES(LD)	6	48	40	₹ 1,835.6 (3%)
DEFENCE(DF)	3	48	40	₹ 1,797.8 (5%)
PHYSICALLY HANDICAPPED(HP)	3	48	40	₹ 1,797.8 (5%)
RAIL EMPLOYEE(RE)	1	48	40	₹ 0 (100%)
HIGH OFFICIALS(HO)	1	48	40	₹ 1,703.2 (10%)
PARLIAMENT HOUSE(PH)	1	48	40	₹ 1,324.7 (30%)

Back   Proceed

Algorithm Flowchart for Seat Availability:
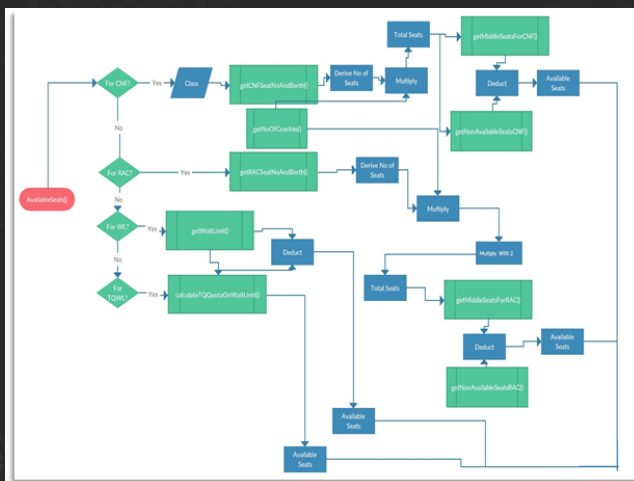
Multiple Passengers can book at a time and can Download PDF or Mail PDF to their registered email id.

Seat Allocation (Allocates Available seats from middle of Train also undertaking Passengers Berth Priority and thus preventing accidents)
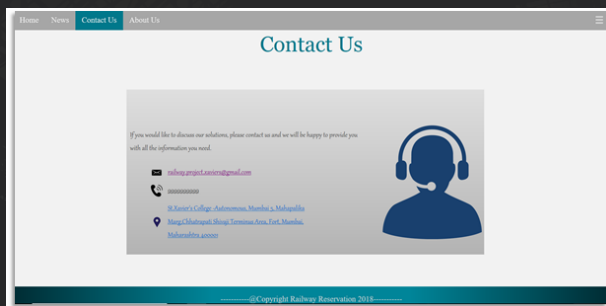

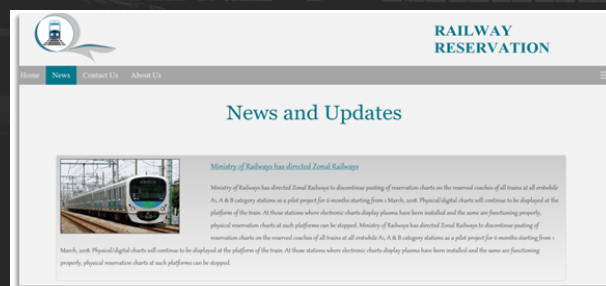Algorithm Flowchart for Seat Allocation :

The ticket generated :

Display of the number of passengers and cost :

Price : Includes the route, train source, and destination, because trains with the same source and destination but different routes may have different prices.

Passengers can also cancel their ticket, see traveling history and download the updated ticket.

Seat Cancellation (Cancels the ticket and promotes another passenger to a better train status automatically)

On Ticket Reservation completion, the Booked Page displays your ticket which can be downloaded or emailed to you.

Algorithm Flowchart for Seat Cancellation

Android Applications accomplish 2 points below:-

1. QR Scanner: -Scans the QR code on the ticket (only our scanner) due to ....an extra layer of encryption preventing decoding by other scanners.

Tracking train location on web portal :

Contact Us Page :

News Update Page :
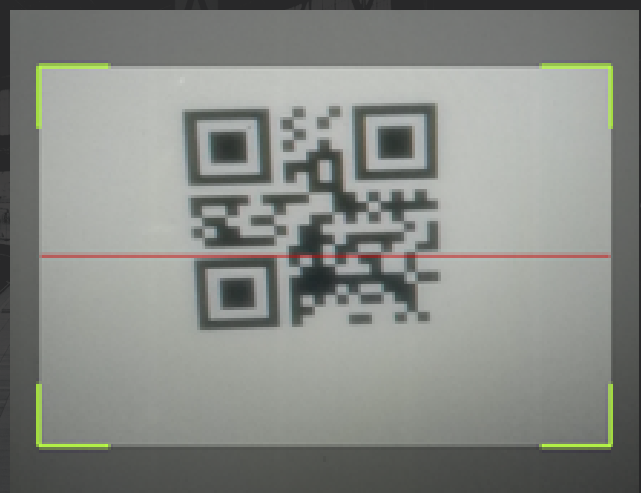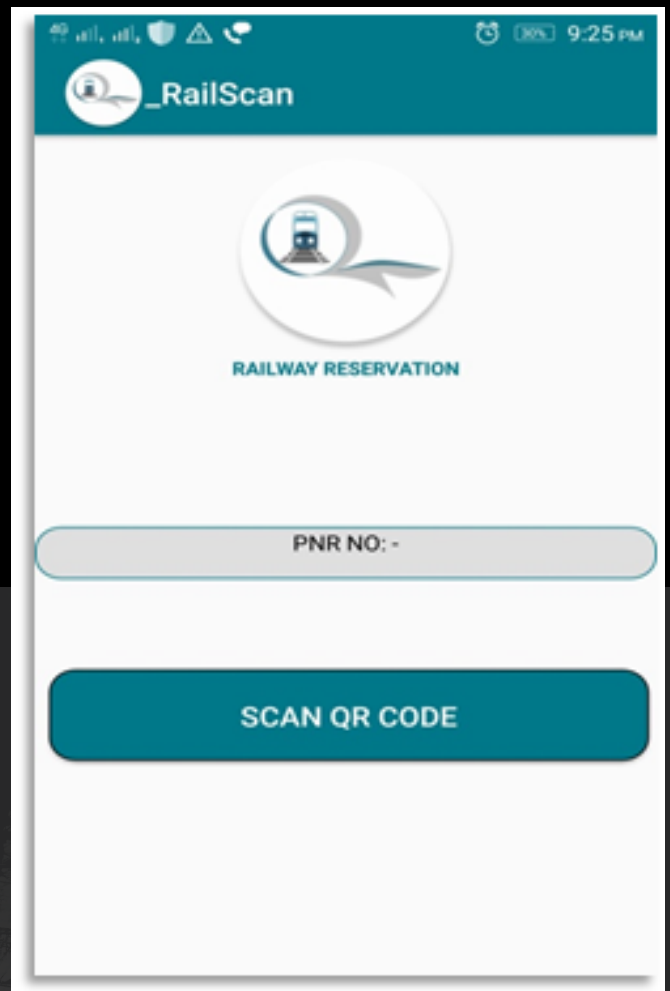
The **Cancel button** and following **Yes** button when clicked, renders the ticket cancelled.
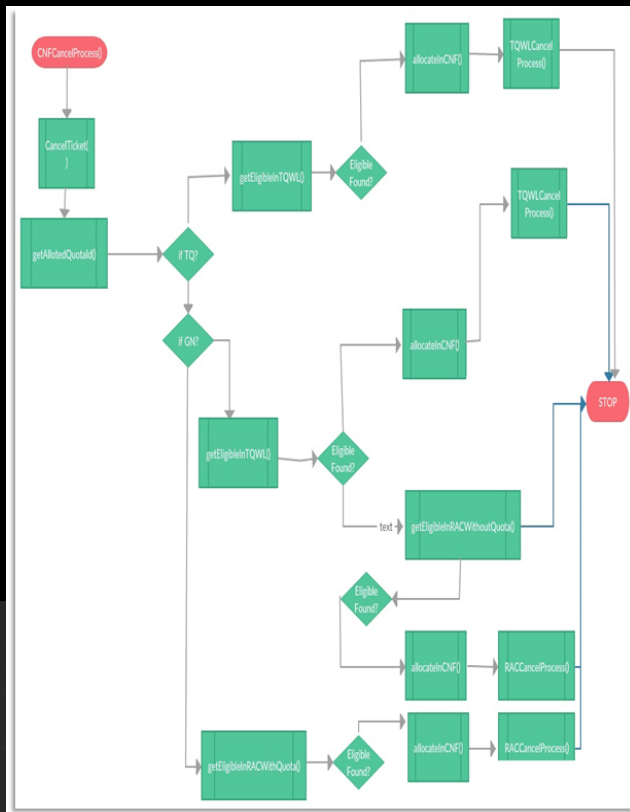
History of User:

History of the user's booking and cancellations.

All passenger and journey information is displayed upon clicking the **Show-details Icon.**

A self-developed real-time chat feature, network tested on two different nodes for an Emergency on the Train(On two ends i. Passenger and Admin ends)

Emergency Chart Board :

Ticket PDF authenticity can be cross-verified with the QR code on the PDF ticket.

_RailScan

RAILWAY RESERVATION

PNR NO: 522422342530

SCAN QR CODE

_LocoRail

Choose a Train

1200==>Kurla-CST Express

1310==>Thane-CST via Ghatkopar Express

1500==>Thane-CST via Vikhroli Express

4100==>Dombivli-CST via Vikhroli Express

6000==>Kalyan-CST Express Via Ghatkopar

7800==>Kasara-CST Express Via Ghatkopar

7810==>Kasara-Dadar Express Via Vikhroli

9000==>Khopoli-CST Express Via Ghatkopar

2. Location Tracker: - The Loco Pilot who drives the train possesses this app. Servlets - Web Service (Restful) communication to retrieve the train list from the database.Passengers can see the Current Location of the Train.

Admin Module - An alternate Login for the admin with multiple reports for analytical purposes.
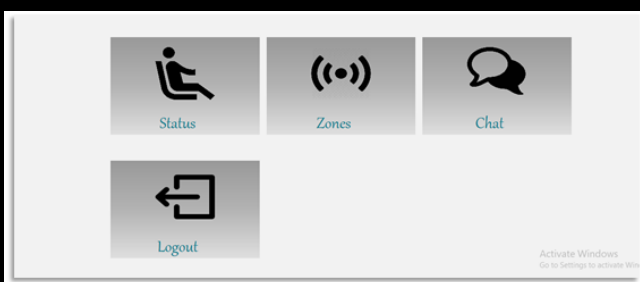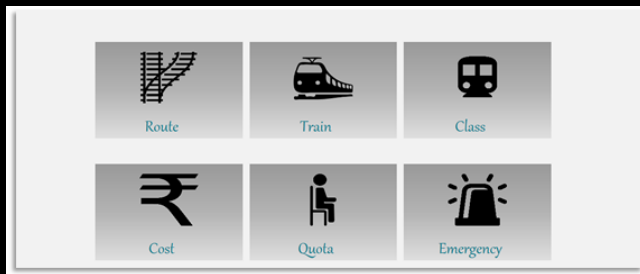
The reports(downloaded in pdf) for analytical purposes under the Admin Module are as follows:

No of Passengers Per Class According To Train :

Train	Class	No of Passenger
Kalyan-CST Express Via Ghatkopar (6000)	Three Tier AC (a3)	65
Khopoli-CST Express Via Ghatkopar (9000)	First Tier AC (Type 1) (a1_1)	40
Khopoli-CST Express Via Ghatkopar (9000)	Two Tier AC (Type 1) (a2_1)	31
Khopoli-CST Express Via Ghatkopar (9000)	Three Tier AC (a3)	416

No of Passengers In Quota According To Train :

Train	Quota	No of Passenger
Kalyan-CST Express Via Ghatkopar (6000)	Tatkal Quota (TQ)	65
Khopoli-CST Express Via Ghatkopar (9000)	Defence (DF)	4
Khopoli-CST Express Via Ghatkopar (9000)	General (GN)	155
Khopoli-CST Express Via Ghatkopar (9000)	Physically Handicapped (HP)	1
Khopoli-CST Express Via Ghatkopar (9000)	Ladies (LD)	8
Khopoli-CST Express Via Ghatkopar (9000)	Senior Citizen (SS)	80
Khopoli-CST Express Via Ghatkopar (9000)	Tatkal Quota (TQ)	239

No of Passengers In Status According To Train :

Train	Status	No of Passenger
Kalyan-CST Express Via Ghatkopar (6000)	Confirm (CNF)	65
Khopoli-CST Express Via Ghatkopar (9000)	Confirm (CNF)	371
Khopoli-CST Express Via Ghatkopar (9000)	Reservation Against Cancellation (RAC)	48
Khopoli-CST Express Via Ghatkopar (9000)	Waiting (WL)	68

No of Trains running On Routes :

Routes	No of Trains running
1	3
2	2
3	3
4	2
5	3
6	1
7	3
8	1

No of Emergency Chats Per Day :

Week Day	No. Of Emergency Message Received
Monday	7
Tuesday	2
Wednesday	0
Thursday	1
Friday	2
Saturday	0
Sunday	0

Project by

Rahul Singh & Sanjana Gopalakrishnan

"Tell me and I forget. Teach me and I remember. Involve me and I learn."

- Benjamin Franklin
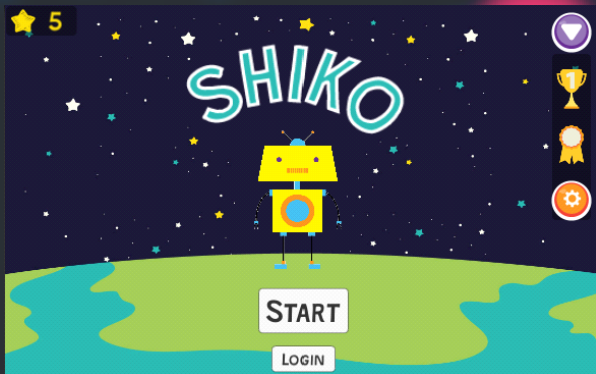
SHIKO

-Tiana and Katherine

Keeping this quote in mind we developed Shiko which is a mobile based Android Game targeted at children. We were inspired to create Shiko because we felt the need for an App that is able to combine both learning and development in an exciting way.

In a world where children spend 1-3 hours on a mobile device daily, why not encourage them to use apps for their betterment instead of mindlessly playing games which have no benefits. Shiko aims to be such an app that balances fun and learning for children.

Going one step further, some of our games have the potential to be used by people with learning disabilities to help them improve certain skills.

The inspiration behind Shiko was found when we were in the train travelling home from college. There was a child sitting beside us. For the entire duration of the ride she was glued to a mobile phone and playing pointless games. It occurred to us that the younger generation is completely dependent on smartphones and the potential of creating an app that could positively impact the minds of these users was very fulfilling.

We created 5 games in our beta module:

1. Unlocked is a memory based game. Users are required to remember a certain sequence of digits in a given time frame. It can be used to enrich the working memory.

2. Match It Up is another memory based game. Users are required to flip tiles and remember the location of tiles containing the same image and match those tiles.

3. What's Bigger is a problem solving game that can be used to measure the flexibility and mathematical skills of a user. Numbers are displayed and the user must select the greatest number.

4. Smiley Wiley is used to develop emotional maturation among users. An image is displayed and based on that image the user must select the emoticon depicting the emotion felt in that image.

5. SpaceSpeller is a game that aims to exercise a child's spelling skills by making them spell words by tapping on floating alphabets. It's fun filled game comprising of bananas floating in space that is endearing to any child. It is a game that makes spelling practice fun for a child.

Taking on 'Shiko' as a project was truly a learning experience that enabled us to explore and understand what a user really looks for in a mobile application, from the UI to the UX.

We got to understand the thought process that goes into creating a captivating application for children . We acquired the skills to work in Unity with C# and firebase as a database..

Overall ,it was an enjoyable process and an experience that we will both cherish.

PLACEMENTS

Akash Srivastava

Placement : Deloitte
Designation : iOS Developer

Description :
"I am working as an iOS developer working on an internal Deloitte project overall experience has been great and I'm learning a lot which will help me in the future."
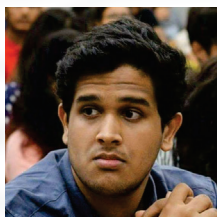
Akshat Yadav

Placement : Camp K12
Designation : Asst. Technical Er.

Description :
"As a assistant technical engineer, my role is to develop softwares and design curriculum for the courses that the company offers."

Anay Singh

Placement : Mahindra & Mahindra
Designation : Deputy Manager - Data Sciences

Description :
Using data analytics and machine learning to improve business profitability and enhance business processes.

Anwesha Das

Placement : Deloitte
Designation : Java Custom Developer

Description :
"I am Java Custom Developer (Technology Consulting | System Integration),currently staffed on a US Government and Public Sector (GPS) project for the State of Indiana (DES)."

Apurva Agarwal

Placement : Deloitte - Banglore
Designation : Associate Analyst

Description :
Currently working on a US based HealthCare project which involves building up Rest Services for a client application using JAVA , Spring Boot.

Digvijay Pandey

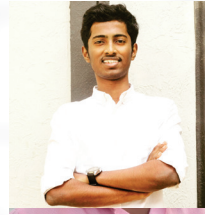Placement : Deloitte, Gurgaon
Designation : Analyst

Description :
Working as an analyst with the Analytics and Cognitive division of Deloitte Consulting US-India Pvt. Ltd.

Farhan Thakur

Placement : Infosys - Hyderabad
Designation : IT Guy

George Dominic

Placement : Media.net
Designation : Search Engine Monetization

Karen Henriques

Placement : Infosys
Designation : Operation executive

Kevin Nadar

Profession : Enterpreneur

Description :
Manufacturer and distributor of designer and custom made gel and paraffin candles. Supplier of sea shells in Bombay.

Lakhan Khanchandani

Placement : Media.net
Designation : Digital Content Analyst

Description :
Optimizing domain names for internet advertising, investigating websites, checking keyword lists of advertisers, enhancing customer's portfolio

Leon Rasquinha

Placement : Kapso Business Services
Designation : Business Analyst

Description :
Handling key client accounts, personal visits & field trips to their office/factory/outlets and then analyzing financial and operational information of the enterprise.

Melwyn Alfred Sequeira

Placement : EY (NKP Goregoan, Mumbai)
Designation : Risk Advisory professional

Description :
Working as Risk Advisory professional(SAP Security) in EY and helping business to establish governance and compliance in their SAP environment.

Muqsit Agha
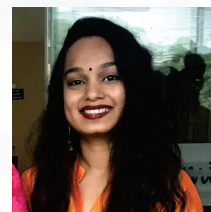
Placement : Capgemini
Designation : Dot Net Developer

Description :
A3 Rank named Software Associate

Sanchika Menezes

Placement : Deloitte
Designation : Manual Tester

Sweeny D'Souza

Placement : Capgemini India Pvt. Ltd.
Designation : Software Associate

Pranita Kakade

Placement : Flitzo pvt. Ltd, Pune.
Designation : Growth Marketing associate.

Description :
Digital marketing- Organic and direct.

Suruchi Joshi

Placement : Deloitte - Powai
Designation : Employee

Description :
Working in Deloitte Consulting India Pvt. Ltd.

Vyshak Manakkal

Placement : Deloitte USI
Designation : Secondary DBA

Description :
*Technology wise I work with Ms SQL server,
Altassian Bamboo for build deployments and
Jira for project management.*

Daniela Andrade

Placement : TCS - Banglore
Designation : Network Analyst

Description :
*We design and maintain the network infrastructure of our
client (British Telecom) in UK by planning the routes and
equipments to be placed using different softwares*
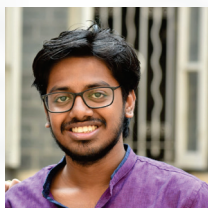
Utkarsh Pal

Placement : Think and learn Pvt LTD - Byjus
Designation : Buiseness Development Associate

Description :
*The primary role as a Business Development Associate
is to build sales by contacting and building relationships
with new and existing clients.*
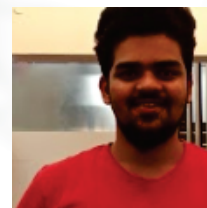
Darpan Shinde

Placement : iTransparity
Designation : Jr. Developer

Description :
*Work is mainly based on developing complex websites
and web technologies using frameworks like
laravel and codeigniter.*

The Magazine Team

Anshita Gupta - (SY BSc-IT)
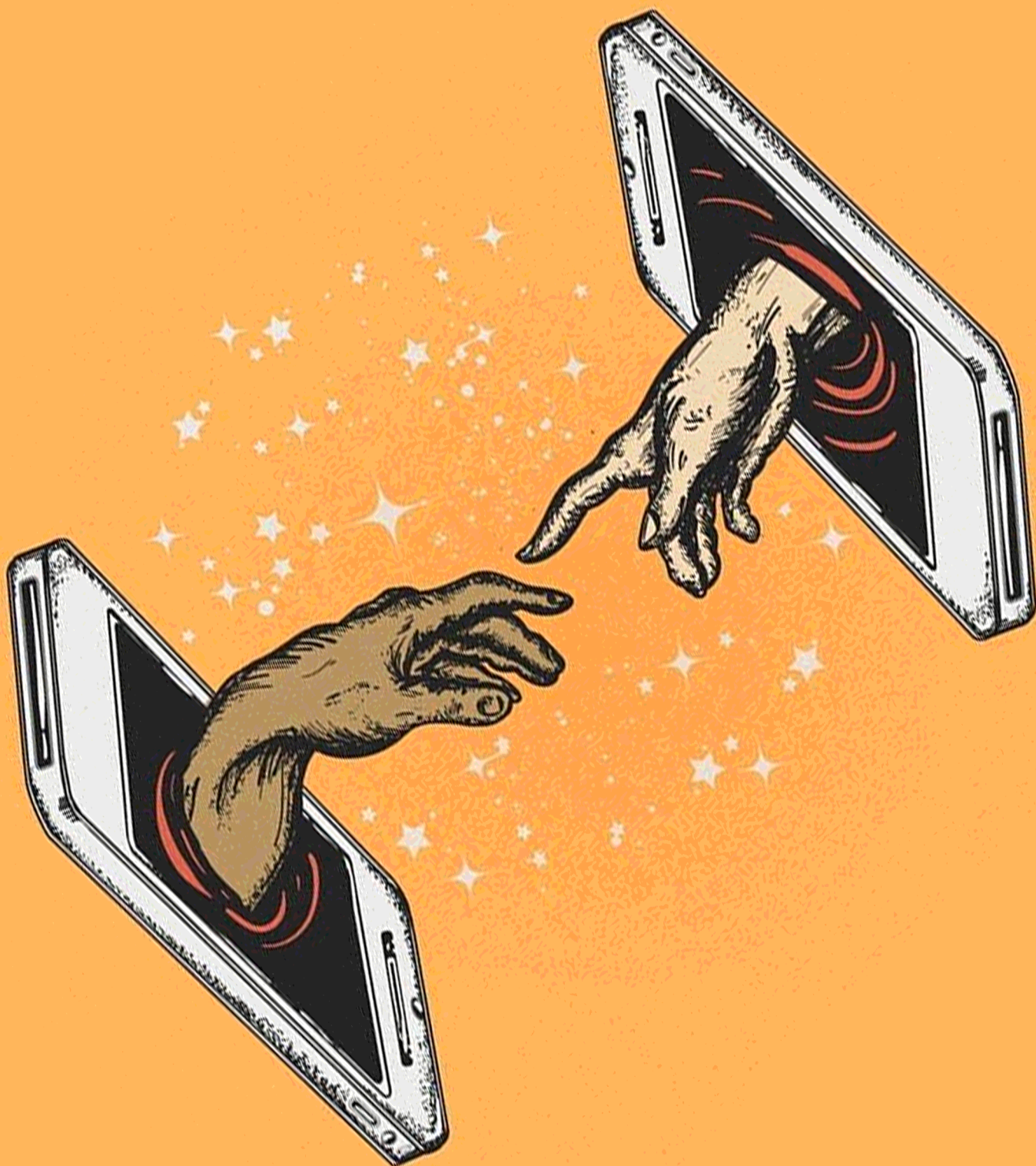Rishank Pandey - (SY BSc-IT)
Malhar Ghadiali - (SY BSc-IT)

Prof. in charge: Prof. Lydia Fernandes

Noah Sebastian - (SY B-Voc)
James Barboza - (TY BSc-IT)
Abhijot Sasson - (SY BSc-IT)

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5, Mahapalika Marg, Fort
Mumbai 400001