Shri Vile Parle Kelavani Mandal's

DWARKADAS J. SANGHVI COLLEGE OF ENGINEERING

Vile Parle (W) Mumbai - 400 056.

DJCSI

PROTOCOL

VOLUME 14

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TESTIMONIALS

Dr.Hari Vasudevan

Principal, DJSCE

“

The CSI student chapter of our college has been working diligently to help the students gain exposure to the various technological advancements along with their regular academic curriculum. The success and the magnitude of these events highlight the tremendous growth DJ-CSI has undergone year after year. This is further highlighted by the fact that the committee was awarded the best CSI Student Chapter of India. I wish the DJ-CSI committee all the very best for their future endeavours

”

Dr.Vinaya Sawant

DJCSI Student Branch Counselor

Head of Department, I.T.

“

Dear students, I am delighted to present the 14th edition of Protocol. Every year DJCSI committee gears up with new development in the activities that not only benefits students in the technological advancements but also provides an opportunity to explore the outside world with confidence. This year Protocol magazine throws light on various events organised under DJCSI, the insightful technical articles and the outstanding research projects that will definitely enhance the technical knowledge and inspire the students to a great extent. I would also like to take this opportunity to thank our Principal, Dr. Hari Vasudevan, Dr. A.C. Daptadar, Vice Principal (Admin.), Dr. Manali Godse, Vice Principal (Academics) as well as the faculty of IT Department for their constant support and encouragement.

”

TESTIMONIALS

Varun Vora

Chairperson, DJCSI

Technology, the great growling engine of change, like art is a soaring exercise of the human imagination, and being the chairperson of DJ-CSI, I am proud to witness it firsthand. Feeling genuinely appreciated lifts people up. At the most basic level, it makes us feel safe, which gives us the freedom to put our best foot forward. I would like to express my gratitude towards our HOD, Dr. Vinaya Sawant, and our faculty at the Dept. of Information Technology for being that constant source of support and guiding us to a path of success. Despite these unprecedented circumstances, we were able to successfully overcome all the hurdles and all the credit for it goes to the entire team of DJ-CSI 2020-21. Being a chairperson is not easy, but with a team like this by your side, everything seems effortless. The team has always motivated me and pushed me to the limits so that DJ-CSI can see better days. I wish that DJ-CSI continues to take giant strides in the right direction and accomplish whatever they set out to do in the future.

CONTENTS

EVENTS IN 2020-2021

WORKSHOP ON GIT AND GITHUB

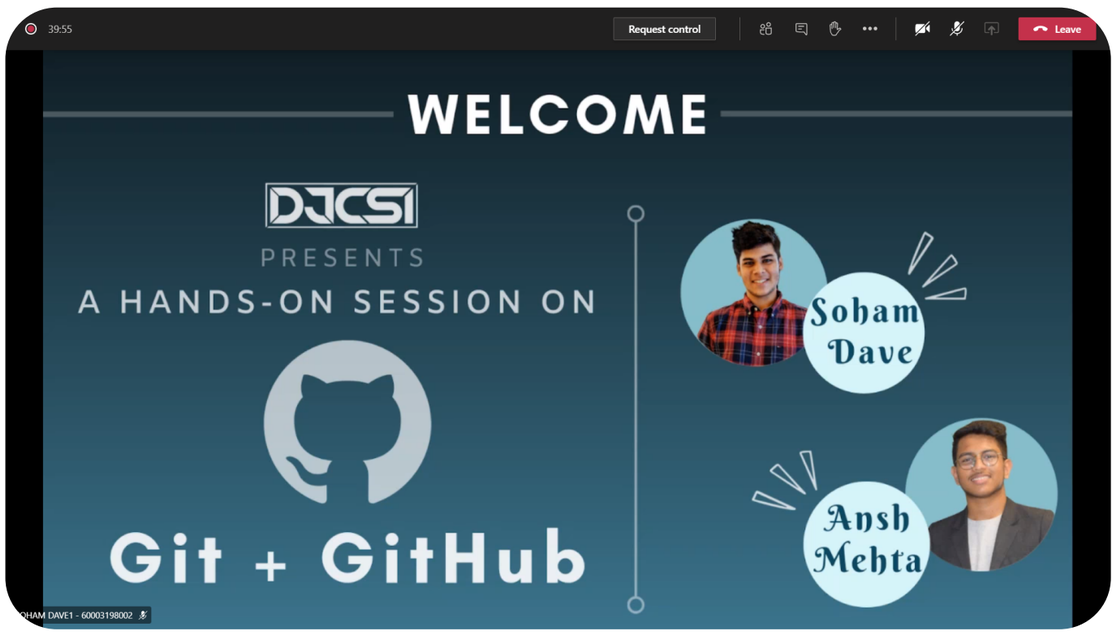
For its first event of the year, DJCSI conducted a **workshop on git and GitHub**, a powerful tool and an important concept for young developers to understand. The workshop, conducted online on **MSTeams** on 15th January 10 am onwards, enjoyed a healthy influx of 105 students, keen to master Git and Github. The workshop was a highly informative and concise session for introducing students to the basics of Git, GitHub and version control.

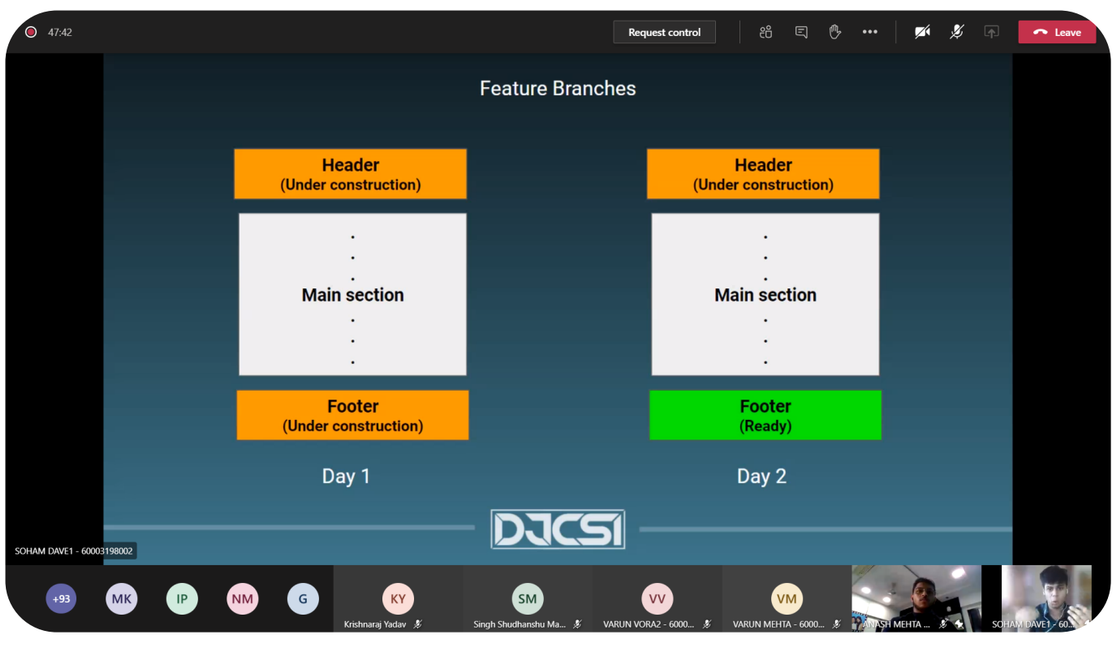
It was conducted by committee members and experienced developers **Ansh Mehta** and **Soham Dave** who did an extraordinary job of explaining concepts in a student-friendly and simple way replete with relatable analogies. A meticulously planned event, it was executed smoothly and was a resounding success amongst all the participants.

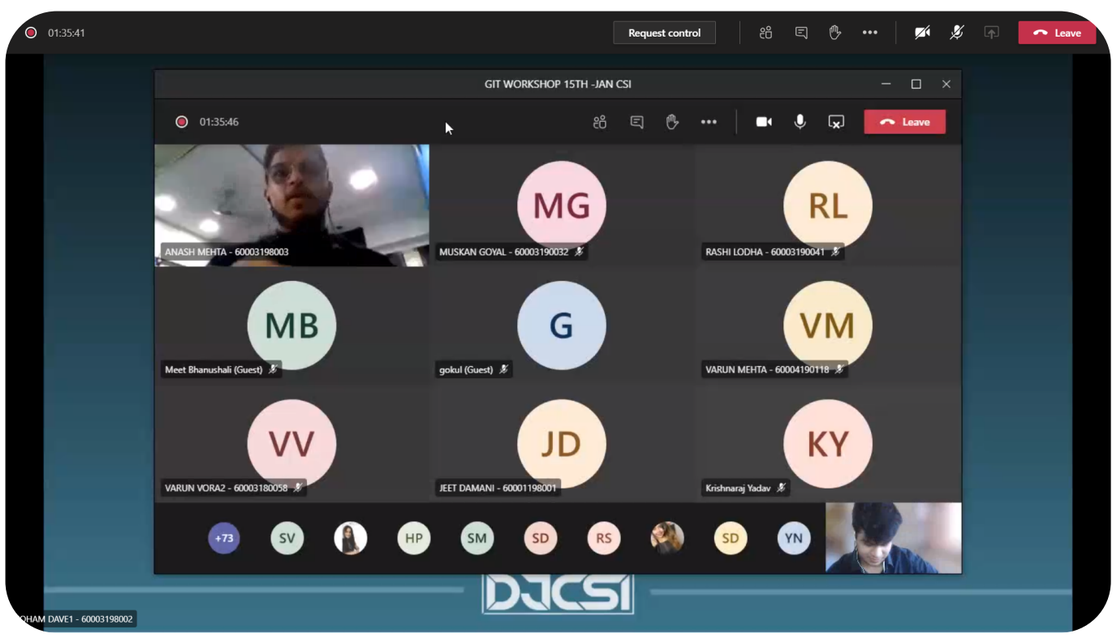
The workshop gave participants an overview of what git and git hub is. The use and importance of git in the industry was thoroughly explained and participants understood the basic framework of what git is and how it worked. The mentors first carefully explained how git works on the local pc and how to commit code using git also doubts of the participants were cleared. The hosts cleared the air over the use of branches in Git,and guided them in successfully submitting their first pull request. Also, participants learned how to create their own repository in git and even learned how to push and pull code from the said repository.

A brief introduction on how git is needed in open source projects and the way to work with other people on the same code easily using git was shown. Commit, push and pull are among the commands that were shown and explained in the workshop. To ease the job of remembering the use of each Git command, participants were given a cheatsheet which delineated every command they learnt and it's function.

The session provided a basic but thorough overview of the working of the software such that participants could start implementing it in their own projects.

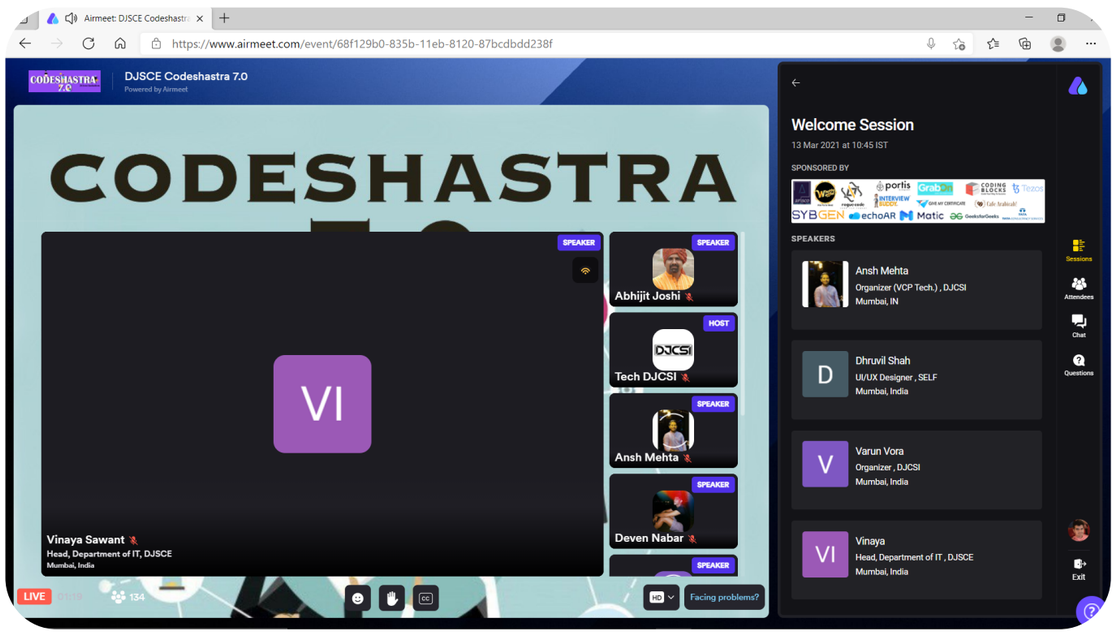






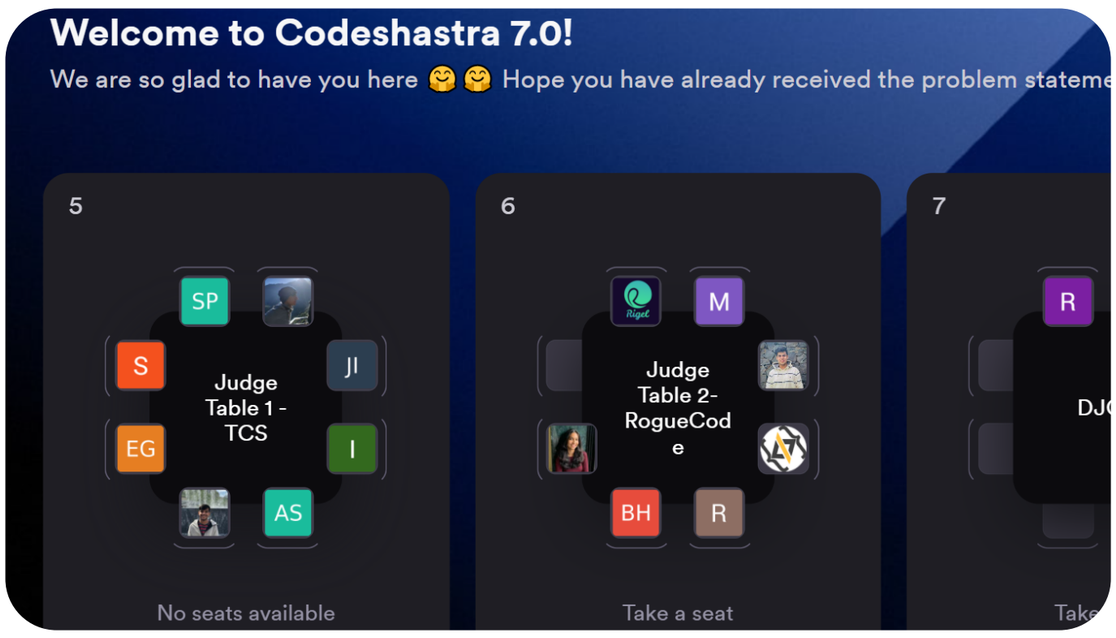
EVENTS IN 2020-2021

CODESHASTRA 7.0



The 7th edition of DJCSI's flagship event Codeshastra organized on the 13th-14th March was an astounding success. Time and again, CodeShastra has proven to be an excellent platform for participants to keep up with the rest of the IT sector. Adjusting to the new norms considering the **pandemic** ravaging the city, DJCSI was able to quickly adapt and conduct its **first-ever online hackathon** to push the physical boundaries/limitations and explore what all can be achieved via the online medium.

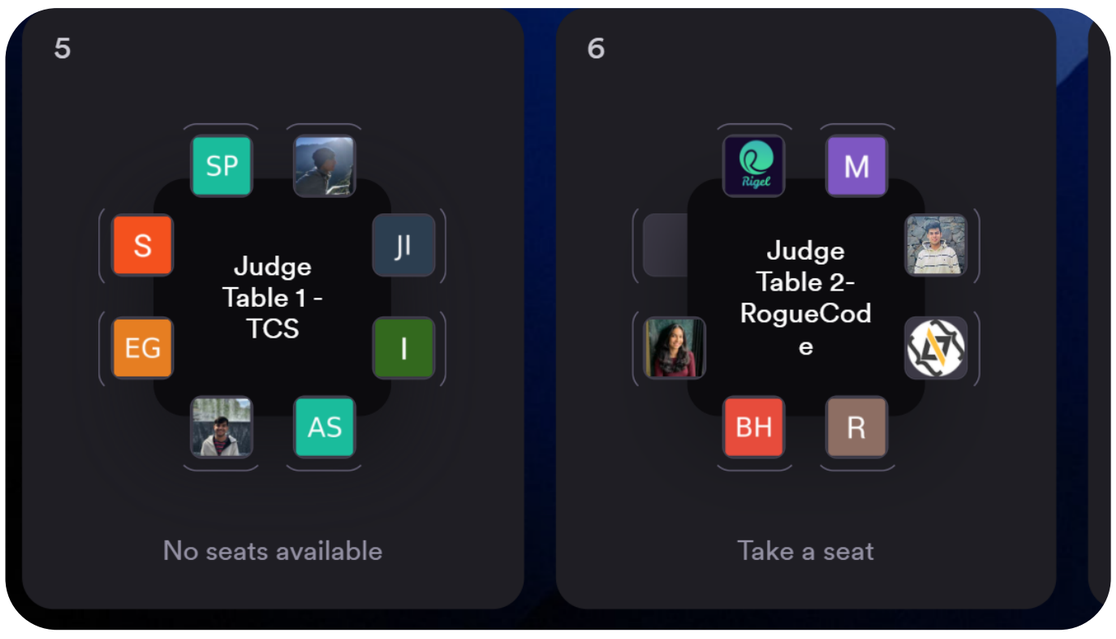
To adopt and organize an online platform for the first time. And optimizing the technical aptitude in a fun and entertaining way whilst bridging the gap between university and industry was a tough task. However, it was smoothly executed.



Codeshastra 7.0 attracted more than 550 applications from which 45 teams were selected. The event started with the opening ceremony that made the participants accustom to '**AirMeet**', the official event partner and platform. The ceremony ended with judges assuring the participants that they would be there to assist and solve their doubts and oversee the progress.

All the online AirMeet discussion tables were buzzing with teamwork. During the immense 24 hours, the projects were built overnight and polished up for the presentation. The codebase was maintained on DJCSI's git repository.

Finally, the judges decided on the three winning teams, and the prize distribution ceremony was held, where the winner was team 'Avian' which had members from Universal College of Engineering Mumbai, KJ Somaiya as well as VJTI, 2nd place was team 'Custodians of Chronology' from NIT Karnataka and at the 3rd place was team 'Whitehat Jrs' from DJSCE itself.



It was a very intense battle, and the stakes were high. Without **Dr. Vinaya Sawant** and senior faculty members, it would have been a near-impossible task. Thanks to **Airmeet** for the online platform, the hackathon was graced by great judges from leading companies like **Tata Consultancy Services, Rogue Code, and Data Science Wizards.**

EVENTS IN 2020-2021

CSI WEEKEND

In an attempt to break the monotony of the virtual semester, DJCSI conducted for the first time ever, a never seen before event: CSI Weekend. The event was conducted online on discord over the course of two days, Saturday 6th February and Sunday 7th February. Planned with meticulous detail from start to finish, it is safe to say this venture was a resounding success.The event was envisioned to be a fun-fair like extravaganza, with different booths from which participants could move to and from as they pleased. This vision was brought to life despite it being virtual by using the social platform discord where different channels were set up for different activities. The chairperson inaugurated the event with a speech welcoming the participants. In the speech, general rules were explained, upcoming events were discussed and the timings for the important fillers were announced. The help desk channel, for anyone who needed assistance throughout the event ,and other relevant details were mentioned for the benefit of the contestants.

DAY 1

This day had two main events, 'tech tac toe' and 'atlasT' both of which saw a very healthy participation from students from all across Mumbai. Tech tac toe, a fresh take on the classic game X & O, was one of our two major technical events. Any doubts pertaining to how the game was to be played, were cleared upfront. Roll it for the century involved emojis and decoding them as fast as possible. This event was meant to cool the participants down after a competitive game of Tech tac toe. While they were not busy enjoying the main events, participants had a wide variety of filler games at their disposal like among us, In addition, there was a music channel set up for participants to groove to their favourite tunes and let their hair down.In collaboration with DJS Beats and Aura, cultural acts were put on display for the viewing pleasure of the participants

DAY 2

On this day, participants had two main events to look forward to; Lockout Debugging and Roll it for the century. Lockout debugging was a quintessential debugging competition with two rounds where participants put their programming skills along with their analytical skills on full display. atlastT was a combination of childhood favorites atlas and name-place-animal-thing rolled in one. DJ Lit performed bards of their latest collection of poetry to refresh our participants with some colloquial mastery. They also inspired the new batch of DJSCE to think creatively and cleared all their doubts about the cultural committees of our college.

CONCLUSION

CSI Weekend was supposed to have something for everyone and we stayed true to that promise with interactive fillers and technical as well as non-technical events all throughout the 2-day extravaganza. The new students and first years got an opportunity to connect with their classmates and seniors, which would hardly be possible otherwise due to college being online. The participants logged off with the boatload of prizes and goodies they had won along with the memories of a weekend worth remembering.

TRENDING PROGRAMMING LANGUAGES

There are hundreds of programming languages, but all do have some limitations. These limitations encourage developers to dig deeper and develop new programming languages. Here are the top 5 new languages that have the potential to dominate the job market soon. Some of these languages can reach the corners where the existing programming languages fail to reach or are not effective.

GO

Go or GoLang, is a C-style language, a procedural programming language created by engineering leads at Google in 2007. Go was designed to make the software development process in Google more productive and scalable. In 2009, developers resealed Go as an open-source project. Go ranks among top programming languages with a clean and easy-to-read syntax. The prime areas where Go is used are web development, backend and networks, and systems programming. This programming language already gained attention from world-known enterprises. Among them include such giants as Google, BBC, Uber, Docker, Intel, Medium, Baidu, and Alibaba. Go, being a Google initiative, has a noble supportive organization, community, and extensive libraries.

TYPESCRIPT

TypeScript is an object-oriented programming language developed and maintained by Microsoft. It was first made public in 2012. It is an open-source static type framework designed on top of JavaScript. It is a superset of JavaScript, built to extend the functionality of JavaScript. It can help you avoid bugs that experts usually run into when writing JavaScript by static type-checking the code. The most popular and trending JavaScript framework Angular 2.0, is written in TypeScript.
Does this modern JavaScript, TypeScript, have the potential to overpower JavaScript?

JULIA

Julia is a modern, high-level programming language developed in 2009. On its first release in 2012, its developers introduced it as a programming language which is something as usable for general programming as Python, as easy for statistics as R, as natural for string processing as Perl, as powerful for linear algebra as MATLAB, as good at gluing programs together as the shell. Julia's syntax for math operations looks more like the way math formulas, making it simpler for non-programmers to pick up on. It is an excellent choice for programs that require numerical computations, such as, Machine Learning, Artificial Intelligence, and Data Science. Julia is also used for research at NASA and Lawrence Berkeley National Laboratory, while MIT has a Julia lab dedicated to the research and development of the language. Do you see Julia ruling the world of computational science in the future?

RUST

Rust is considered a system programming language and was designed at Mozilla Research. Since its first open-source release in 2015, Rust has drawn lavish attention from the community. It has also been voted the most loved programming language on StackOverflow's developer survey each year since 2016. Rust is syntactically like C++ but faster and can guarantee memory safety as there is no garbage collector. Rust has already been doing wonders for leading companies like Mozilla, Dropbox, Yelp, and npm. Learning Rust cannot be easy, and it demands a good knowledge of C++. But once you master it, you can undoubtedly do lollapaloozas.
Can the most loved programming language on StackOverflow's developer survey be your favorite programming language?

SCALA

The idea to combine functional and object-oriented programming gave rise to this multi-paradigm programming language - Scala. Scala is not fairly as new as you think since it was first introduced in 2003. However, it is peculiarly within the past few years that Scala has begun to develop significantly. Scala is a statically typed language that blends the best features of Java — such as its Object-Oriented Structure and its lightning-fast JVM runtime environment — with a modern twist. Scala empowers developers to elevate the quality of their code to resemble pure math. It allows for concurrent programming, allowing complex procedures to be executed in parallel. Mobile app development companies prefer Scala for building robust apps. Renowned companies like Twitter, Airbnb, Tumblr, and Netflix have been using Scala.
Can Scala supersede the most loving language of all time - Java?

DOES SOCIAL MEDIA INFLUENCE THE STOCK MARKET ?

Financial social platforms have become an effective channel for investors to interact with others and gain insights into financial market trends. The massive amounts of social media data available today can confer huge commercial and academic value. Utilizing social media to predict the stock market, while in its infancy, has already proved highly accurate compared with other methods of forecasting stock rises and falls. This suggests that tweets pertaining to stocks with either positive or negative sentiment may have a rippling effect, all before hitting the stock market.

For instance, it's possible that the more people who post positively about a stock, the more likely other people in their social media network are to post positively about the stock, or at least feel positively about the stock themselves. Before, the only information on how other people felt about a certain stock was to look at how it was doing in the market. With Twitter in play, now you can see how people feel about a certain stock through posts before those feelings reach the market.

"Facts only account for 10% of the reactions on the stock market; everything else is psychology." - André Kostolany, a stock market investor who made most of his fortune during the reconstruction of Europe after World War II, made this observation. .

One scary observation is that "reddit" retail traders herding together, move from sector to sector targeting meme stocks, creating waves of volatility and price surges.The postings create fear of missing out (FOMO), jealousy, goad followers to trade, thereby galvanizing massive herd mentality. The Reddit-roused herd of traders, pushing the price of few select stocks to the moon, is being hailed as the democratizing of financial markets.

However, the sharp rise and precipitous fall in the meme stock prices caused by surges in trading volumes mirrors a pump-and-dump operation. In the aftermath of these price spikes, both naïve and sophisticated traders grapple with the characteristics of the risks associated with these trading strategies.

The 'Musk Effect', while companies across the globe gasped during the pandemic, Musk's portfolio only grew stronger, and when he was named the richest person on the planet in early 2021, the 'brand Musk' has become so big that just the tweets of the 49-year-old inventor are enough to shake the markets.

Conclusion: Whether or not echo chambers or influencers are fuelling changes in financial markets, it seems that social media can affect market activity for good and bad

TECHNOLOGICAL ADVANCEMENTS DURING COVID-19

In just a few months, the COVID-19 crisis has brought about years of change in the way companies in all sectors and regions do business. The changes that were brought about were not only in the business sector but also in various fields like medical, education, and entertainment. Covid-19 gave the stimulus to leap in the science and technology segment.

Technological advancements in online shopping and delivery system helped combat covid-19 and enabled the business to continue running throughout the period, thus helping people deal with the virus more comfortably. Robust logistics systems are helping in enhancing online shopping, where robots are being used as the means to deliver food supplies and other commodities because in-person delivery isn't virus-proof. Countries like China and the United States have launched contactless delivery services where the customer's goods ordered are élite and dropped off at the selected locations instead of the customers picking for themselves using their hands. They were a necessary step to minimize the movement of people and controlling the coronavirus's spread.

Coronavirus is a highly contagious disease that can stay on the surfaces of many things for more than 24 hours thus, payment through cash is discouraged to prevent the spread of coronavirus to those who are not infected. As a solution to this problem, different countries have employed the use of soft money or contactless payments to pay for any services.

Several banks in China, the United States, and South Korea have instigated various methods to ensure banknotes are uncontaminated before circulating in the market. Many platforms have been designed to allow online purchases and marketing of goods and services effectively without any need for physical interactions of the customer.

To prevent the spread of the virus it was necessary to have as little contact with others as possible, hence remote working was the only plausible way in which industries could continue with their normal functions. Technology has made working remotely more effective. Technology facilitates remote working through the use of virtual private networks, voice over Internet protocols, enabling virtual meeting through zooms or google platforms, and with the use of facial recognition technologies allowing the person to appear behind the virtual background.

Due to the increasing number of patients infected with the coronavirus and how children were the biggest carriers of the disease many countries issued the cessation of all in-person learning classes in institutes to

help thwart the coronavirus spread. To deal with this issue many institutions started offering online classes through online platforms such as Google Meet or Zoom to ensure that the quarantine measures didn't disrupt education. Microsoft Teams and Google classroom not only give a platform to perform lectures but also allow the submission of notes and assignments. All in all, they have become virtual classrooms. Technology implemented in distance learning is the same used to enhance effective remote working. This new online technology also involves the use of artificial intelligence-enabled robotic teachers.

Telehealth is a viable way made conceivable by innovative technology to forestall the spread of COVID 19 and provide fundamental essential care to the patients. The specialists can analyze patients through the description they give using the chatbox or video conferencing utilizing their PC or cellphones and offer rules continuously on what one can do for prevention. Telehealth adoption by the healthcare administrations is readily bridging the gap between physicians, patients, and health systems, enabling everyone, symptomatic patients especially, to interact through virtual channels with their doctors from the comfort of their home, further helping in reducing the spread of the virus to mass populations and the medical staff on the frontlines. Nowadays, all medical services professionals have remote gadgets set up for patient observation and online consultation. These remote networks are effectively capturing and submitting information for translation to other medical organizations. This is a significant move in telemedicine when you can rapidly get the new wellbeing updates to your doctor even though you are homebound. Contingent upon how your telehealth program is set up with the medical care supplier, you can alter, change, and utilize the telemedicine administration for your discussion. Your medical care supplier can advance analytic pictures to the telemedicine specialist for them to inspect, for example, X-rays and your clinical records. The telemedicine expert can conclude and build up a viable recuperation plan online after exploring the clinical records. They can likewise advance your remedy to your closest drug store on the web and get it delivered to your doorsteps The usage of artificial intelligence and robotic-assisted telemedicine has several potential applications in performing a patient diagnosis, monitoring, and clinical care in remote areas. Robotic-assisted telemedicine has assumed a huge part in offering help to the patients tainted with Covid and keep away from direct contact with the specialists. In any case, robots are being utilized to sanitize regions and surfaces where the infection is suspected to be essentially influenced or on the public administrations' regions which loads of individuals use or assemble. They have also been used for food deliveries to families during quarantine in certain countries. Drones have been used to monitor people and deliver items needed in hospitals to take care of patients.

3D printing is useful in building mockups and producing various items based on different materials and designs. This helps make simple parts easily assembled on-site, even without requiring a full procurement.Recently, 3D printing technology was used to design surgical masks for the doctors involved in operating the individuals who have been affected by COVID-19 disease. These 3D printed masks have been effective in reducing virus exposure and may be worn as an alternative to surgical type masks.

Some achievement details focusing on India

As the Covid pandemic rages in India, entrepreneurs are putting in more technology innovations to deal with the crisis and bank on it. Here is the list of technology innovations that sprung up during the coronavirus outbreak:

CoronaOven

Log nine Materials, a Bengaluru-headquartered technology start-up, has to return up with first-of-its-kind a product named CoronaOven that creates use of UV-C light-weight that features a wavelength of 253.7 nm together with important style parameters. The device disinfects surfaces of assorted objects, personal protecting instrumentality, etc. from germs together with bacterium and viruses. This distinctive multi-focal ultraviolet illumination medical aid chamber that claimed to sanitize any surface inside four minutes is out there in several sizes like 20-litre, 33-litre, 40-litre, and 440-liter variants.

Vistar

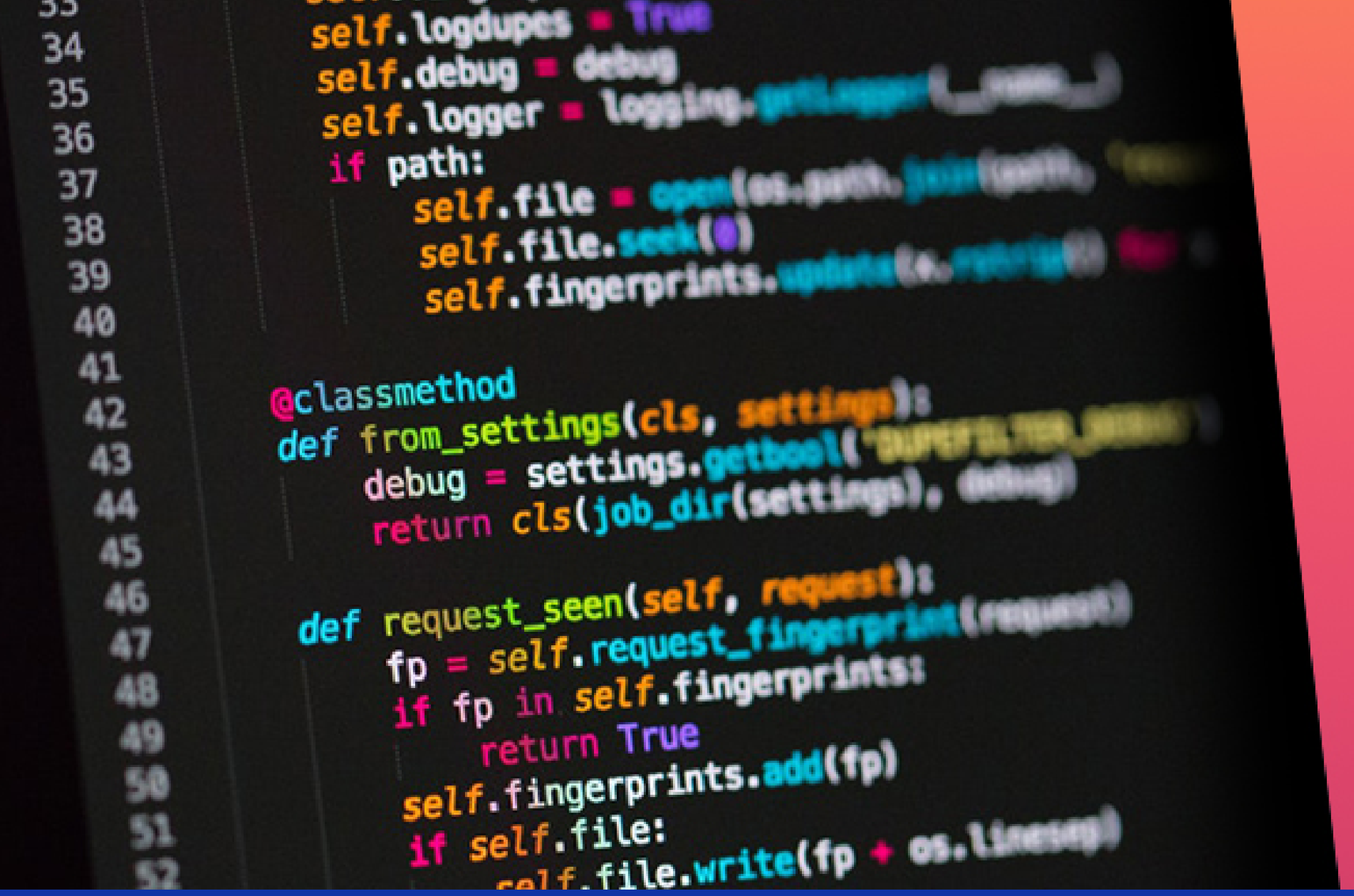
AirOk manufactures air purifiers that use a patent filter technology referred to as EGAPA (Efficient Granular Absorbent Particulate Arrester) to separate major pollutants and evaporated substances. Vistar air purifiers are innovated by a startup primarily based in the city.

Milagrow seagull

Milagrow seagull could be an improvement automaton innovated by Indian shopper complete Milagrow. It displays time to progress and map whereas improvement on the user's device. The automaton plans the trail in a time period in every space to cut back the time taken. This automaton vacuum conjointly options anti-bacterial, anti-microbial, and antiviral properties, that claim to assist minimize the unfold of infections in hospitals and similar environments. The automaton will facilitate slight wet improvement, as per the company's official unleash.

Dozee

Dozee could be a device created by Turtle Shell Technologies that aims to assist in access to higher attention by providing the correct designation of conditions. This device will facilitate a preliminary designation of assorted sicknesses that reduces the time spent in creating selections to go to hospitals and bear multiple tests. it's a sensible contact-free health monitor that one will slip below their pad. it keeps chasing the health condition of the individual through metrics like heart health, stress, sleep quality, among others. It offers a close analysis report on the Dozee apps that may be put in smartphones.



Why ?

WHY PYTHON IS SO POPULAR?

With the ever-augmenting technological world, the companies are shifting to a data-driven approach to make strategic decisions and serve their customers and consumers effectively. This gives rise to the world of Data Science, Machine Learning, and Artificial Intelligence. Over the globe today, these fields are the most trending ones, and they have a really great scope. And these make Python language win popularity with each passing day. Python was first released in 1991 by Guido van Rossum. It took a couple of decades for the programmers to accept Python. But since the early 2010s, it has been roaring and gained stupendous popularity and now outstripping C, C++, Java, and JavaScript.Let's take a closer look into the popularity of Python over the past few years. Here is a visual representation that reflects the popularity of Python. The PYPL (PopularitY of Programming Language) Index is generated by analyzing how often languages are searched on Google. It's pretty acceptable to assume that the more a programming language is searched, the more popular it is.

What makes Python so damn popular?

1. Very beginner friendly

Python is a general-purpose, interpreted, object-oriented, high-level programming language with dynamic semantics. With the feature of dynamic typing in Python, you can declare the variable without specifying its type like String, Boolean or Int. You just need to declare a variable and Python will understand the variable type. This makes Python easy to learn and use. Compared to other languages, Python has a simpler syntax that enhances readability and conceivability. For instance, have a glance at the subsequent codes that print "Hello World" in C, C++, Java, and Python. Python encourages you to focus more on the logic and concept rather than the code. This fascinates the new programmers to learn

Python, and it is now the most prevalent introductory teaching language in several universities. Despite being easier, Python is so powerful that it is a great pick for beginners as well as experts.

2. Amazing community support

Python was created three decades ago, and its popularity has skyrocketed the growth of its supporting community. There are ample documentation, blogs, papers, projects, and video tutorials related to Python ranging from amateur level to geek level for the people to learn and upgrade their skills. As a beginner, one finds a lot of guides in the Python community. Whereas, as an expert, one finds a lot of peers to help. The Python community has massive support of many developers who contribute to the community by creating Python libraries. A programming language cannot flourish if it doesn't have a good supporting community. Python gives an edge over other languages because it has a highly active supporting community.

3. Highly versatile

Python is a highly versatile language used for Data Science, Machine Learning, and Artificial Intelligence, Web Development, Desktop Applications, Business Applications, Cloud Computing, Game Development, and even Embedded Applications. The versatility of Python raises its demand in the job market. Hence each company is shifting to Python for some or the other purpose to improve their services. With all these advancements, Python has managed to stay at the top in the recent years, and I can speculate that it will also stay at the peak for a few other decades.

4. Demand in job market

The popularity of a language is directly proportional to the demand in the job market. There's a huge impact on the job market because of Python's versatility. It is used in most of the technologies by almost all the companies including the top companies like Google, Microsoft, Tesla, Amazon, YouTube, Facebook, Netflix, and the list stretches till infinity. Python has become the core language for future technologies like Artificial Intelligence, Big Data, etc. Developers, Python is never going to leave you high and dry!

Rank by Volume of Job Openings	
1. Python	50,000
2. SQL	50,000
3. Java	45,000
4. JavaScript	38,000
5. C++	29,000
6. C#	21,000
7. PHP	13,000
8. C	9,000

DRAFTING THE PERFECT APPLICATION TO STUDY ABROAD

Many students pursuing a BTech degree look at going abroad to pursue their further education. The whole process can seem daunting and arduous but let's break it down so it seems less intimidating and you can get started with it.

The most sought after course for a Masters in Technology degree is in Computer Science, having a plethora of specializations like Algorithms, Artificial Intelligence, Computational Biology, Bioinformatics, Computer Architecture, Databases, Data Mining, Graphics, High-Performance Computing, Human-Computer Interaction, Networks, Programming Languages, Compilers, Robotics, Scientific Computing, Security, Software Engineering, Systems (Operating Systems, Distributed Systems), and Theory.

Apart from CS, courses like Management Information Systems and Game Design and Game Development are also offered.

The most asked question is should preference be given to subject, institution or location? While there is no magic solution to this conundrum here is some information that hopefully makes this choice easier.

Mostly, people shortlist schools based on costs and availability of funding, job prospects, program ranking, class size, location, competition and living conditions such as weather, the population of international students etc.

Mostly, people shortlist schools based on costs and availability of funding, job prospects, program ranking, class size, location, competition and living conditions such as weather, the population of international students etc. Job prospects and cost of attendance are the most important considerations.

University shortlisting is the most critical part of your application and if done carelessly, can ruin all other efforts you put in GRE and application documents. Schools can largely determine your job and scholarship prospects, so it makes sense to spend enough time researching which schools suit your financial and career needs. While in the process of deciding where to apply, you can take all the exams required for application.

GRE

Did you know? 17% of the total GRE test takers are of Indian nationality!

GRE (Graduate Record Examination) is a multiple-choice, standardized test conducted by ETS. The test assesses how you manage time and the way you work under stress.

GRE has no fixed exam dates. You can decide to apply for the GRE test at any time of the year.GRE test score will be out of 340 marks, and it'll stay valid for 5 years. It is recommended that students take the GRE exam at least 2 months before application deadlines. The computer-delivered test is section-adaptive. This means that the computer selects the next section of your exam based on your performance in the previous section. Different sections of the GRE include analytical writing, a verbal section, and quantitative reasoning.

TOEFL

The TOEFL exam is conducted by the Educational Testing Service throughout the year because of its importance for students wishing to study abroad. A great TOEFL score adds immense value to your academic achievements and can also help you with several scholarship opportunities. Preparing well and going the extra mile will help you ace the test. Some of the top countries that accept TOEFL include The United States of America, Canada, Australia, New Zealand, The United Kingdom, and many other institutions across Europe and Asia These tests are organized up to 50 times every year and a student can choose to appear in any of these slots. However, you cannot take the exam more than once in a 3-day period. The TOEFL syllabus consists of 4 Major sections: Reading, Listening, Speaking and Writing.

IELTS

The IELTS exam is a language proficiency test designed for non-native English speakers to assess their language skills. Recognized by most of the universities in the world, especially in Australia, Britain, Canada, and New Zealand, IELTS offers online as well as offline tests that have a fixed format. These tests are organized up to 4 times or more each month and the results vary based on the form of your examination.

The IELTS exam has 4 sections: Listening, Reading, Writing, and Speaking. The total time given to complete the test is 2 hours 45 minutes.

How important are these exam scores for your application?

How important GRE scores are to a program depends on the program. Some programs are forthright about the importance of GRE scores for admission. Those that strongly value GRE scores usually recommend high GRE minimums or report high GRE averages. On the other hand, programs that don't value GRE scores as much will often say so directly. To be eligible for admission to top universities like MIT, Harvard, UCL, Imperial College, you need to clear a minimum TOEFL Score criteria set by these universities. Generally, these cut-offs are high, and therefore, to make it to the cut, you need to aim for a high TOEFL score. You can check the minimum TOEFL cut-off of your target university on their official website in the admission requirements section.

Foreign Universities take into account IELTS scores to examine whether a person is capable of keeping up with the program's medium of instruction, that is, English. Universities mainly fix the minimum IELTS criteria that applicants need to fulfil in order to be eligible for admissions. Therefore, a student having an ideal IELTS score that is equal to or greater than the minimum criteria will have higher chances of making it to the university over those with an IELTS score lower than the minimum criteria.

The following documents need to be prepared as part of the application process

Statement of Purpose: An SOP is a reflection of 'who you are' in front of the admission committee. This is one of the most important components of your application because this is the only document that is totally under your control. This is the place where you can differentiate yourself from other candidates.

Common components of an SOP include: Background and Aspirations, Academic and Professional relevance, motivation behind applying, interest in the course and university, how you can contribute to the college and what makes you the perfect candidate. Head over to the university course page and find out exactly what they are looking for. Always keep those points in mind while writing your SOP.

Features of a good SOP are:

1.Have a grand opening: It will help you capture the attention of the admissions committee. Talk about an incident or an event in your life that draws you toward the course you want to study.

2.Previous experiences such as internships, projects, contributions, awards won, any workshops conducted and your learnings as well as you can.

3.Highlight which subjects you want to study at that university. It shows that you have done your research well depicts how interested you are.

4.Co-curricular activities are activities associated with your academics like competitions, courses, projects, and events. Adding these shows that you are genuinely interested in the course.

Talk about the subjects, professors or things you find most unique about the course. If you mention a professor's work somewhere in your SOP, it can greatly increase your chances of being considered.

Here are a few don'ts when it comes to writing an SOP

1.Refrain from using templates given by counsellors or websites. By using a template, you look similar to thousands of other applicants.

2. Do not rehash your resume. An SOP is not a verbose form of your resume.

3. Writing an SOP takes at least 4-5 weeks should come after 3-4 iterations. However great you may be at last minute work (especially the engineers), an SOP needs reflection which takes time.

4. Do not be too humble. An applicant needs to sell themself to the admissions committee and the SOP is their advertisement.

Letter of recommendation: LOR is the only place where a third person can help strengthen your application. A good LOR is one that validates your candidacy by sounding genuine, vouching for your ability to excel at your target program and comes from someone who is credible.

As a student, you can help your recommenders by-

1. Reminding them of your accomplishments (try to split it between them based on relevance of the field and subjects)

2. Brief them on your work and what/where you are applying to

3. Provide them with written descriptions of projects that they can use in their letters directly.

Resume:

1. The most important thing to keep in mind – do not exceed a single page. Your resume should be easy to comprehend at one glance. Everything should be included using three to four bullet points, the more concise you are, the better your chances of having a one-page resume.

2. Follow a single chronological order, starting from your latest accomplishments. Have at least two to three things on your profile that will make your resume stand out. Let these achievements fall in line with the values that the university focuses on.

3. Make sure your spelling and grammar are correct. Even the smallest of mistakes can stand out within a single page.

Projects and internships related to the field of application also increase the value of your resume.

A common mistake students make is that they focus all their time and energy preparing for the various exams required for the application. While getting a good score undoubtedly strengthens your application, don't forget to concentrate on the other aspects like your SOP, LORs and resume. A good SOP is what truly makes the applicant stand out from the mountain of applications before the admissions committee. Reinforce your resume with projects, research papers, and internships pertaining to your area of application. This shows genuine interest and perseverance from your side towards the course and sets up a good impression.

This was a short synopsis of the different stages and procedures related to pursuing higher education abroad. Hopefully, it serves as a kickstart to beginning this journey and securing admission to the university of your dreams.

AInstrument

PROJECT 01

IMPLEMENTED BY:
ALI ABBAS RIZVI
BHAVESH SINGH
SRISHTI PRASAD

In today's digital world and fast growing musical instrument technology, the ability to adapt songs to any particular instrumental sound becomes a priceless possession for musicians. With numerous existing tools which cater to remixing original music with instruments, a tool to convert human lyrics into instrumental rhythms is the need of the hour.

AInstrument is a project that aims at filtering out the human vocals in a song using a library Spleeter and turning them into instrumental versions, creating an ideal platform for young talented music enthusiasts to explore and learn to play various instruments. The vocals are converted to covers using the Differentiable Digital Signal Processing (DDSP) library and pre trained Convolutional Neural Networks(CNNs)- Resnet 101 which enables direct integration of signal processing elements with deep learning techniques.

Modern music composers have located their music in terms of tone and texture of the instrumental beats, skipping the more regular and established features of harmony and melody in music. 21st Century music demands introduction of some advanced characteristics, such as fewer lyrical melodies than other periods, and fun instrumental rhythms. The current system of creating covers requires professionals to manually understand the beats and play them on various instruments. It is a trial and error process where musicians improve their covers until they sound perfect. This is time consuming and requires musicians to possess the instrument.

To avoid this, there is a need for a low-cost, easily accessible system that can automatically generate covers not just for a single instrument, but all possible instruments. AInstrument helps turn existing songs to particular instrumental covers to suit different needs and allows artists to release various versions of their songs, without extra effort and money.

Majority of music students who take up instrument learning give up midway because of scarcity of resources which allow them to hear and understand the beats and thus play the instrument. Due to the lack of instrument learning platforms and the parochial availability of song covers for certain instruments, it becomes necessary to develop an inexpensive system which allows students to acquire diverse instrumental covers with ease.

Impacts of AInstrument:

This system removes the dependency of the instrument learning process on musicians. It enables game developers, Youtubers and yogis to use instrumental covers more readily in their games, videos and yoga sessions respectively. The system not only boosts the availability of instrumental covers but also provides a platform for inexpert learners to continue growing independently.

Drishti

A Real Time Application for Visually Impaired

PROJECT 02

IMPLEMENTED BY:
PROF. ARJUN JAISWAL
DHRUV PITHWA
BHAVIN MEHTA
PRIYAM VORA

Navigation issues are commonly experienced by all kinds of citizens at some point of time in their routine life. Especially when we take visually impaired people in concern. They encounter a lot of trouble while traveling. There are nearly sixty-two million visually impaired people in India (as of April 2019). Of these, nearly fifty-four million have low vision, and eight million are blind. Visual impairment often leads to a feeling of dependence on sighted individuals. Thus, there is a sense of restlessness, and visually impaired people often tend to isolate themselves. One of the most critical barriers of visual impairment is the disability to navigate freely both indoors and outdoors traveling.

Currently, several systems aim and are designed to support visually impaired people and to improve the quality of their lives. Unfortunately, most of them were either expensive or lack a robust design. The simplest and the most affordable navigation tools available to them are trained dogs and white canes. Although these tools are very popular, they cannot provide the blind with all information and features for safe mobility, which are available to normal people.

This was the primary motive that encouraged our students of DJSCE to design a system to help blind and visually impaired people so that they can navigate freely and experience things like normal individuals. Dhruv Pithwa, Bhavin Mehta, and Priyam Vora, under the guidance of Prof. Arjun Jaiswal, built a real-time application for the visually impaired - Drishti. Drishti uses 3D audio to guide visually impaired people in the outdoors.

It can also recognize people around them through facial recognition. Furthermore, it has the capacity to save the details of the known ones for audio description. Another important feature is currency denomination detection. Presently, the focus is on the Indian denomination, but the team aims to expand the feature for other currencies as well. The final feature, which is also the most beneficial feature, is text recognition which can recognize digital and handwritten texts.

The project was selected for Aavishkar Project Competition held by Mumbai University, where the team submitted a research paper under the UG category. They were among the top 5 teams that were shortlisted at the institutional level. They were also shortlisted for DJASCII 2021, where they presented Drishti, which gained a boatload of appreciation.

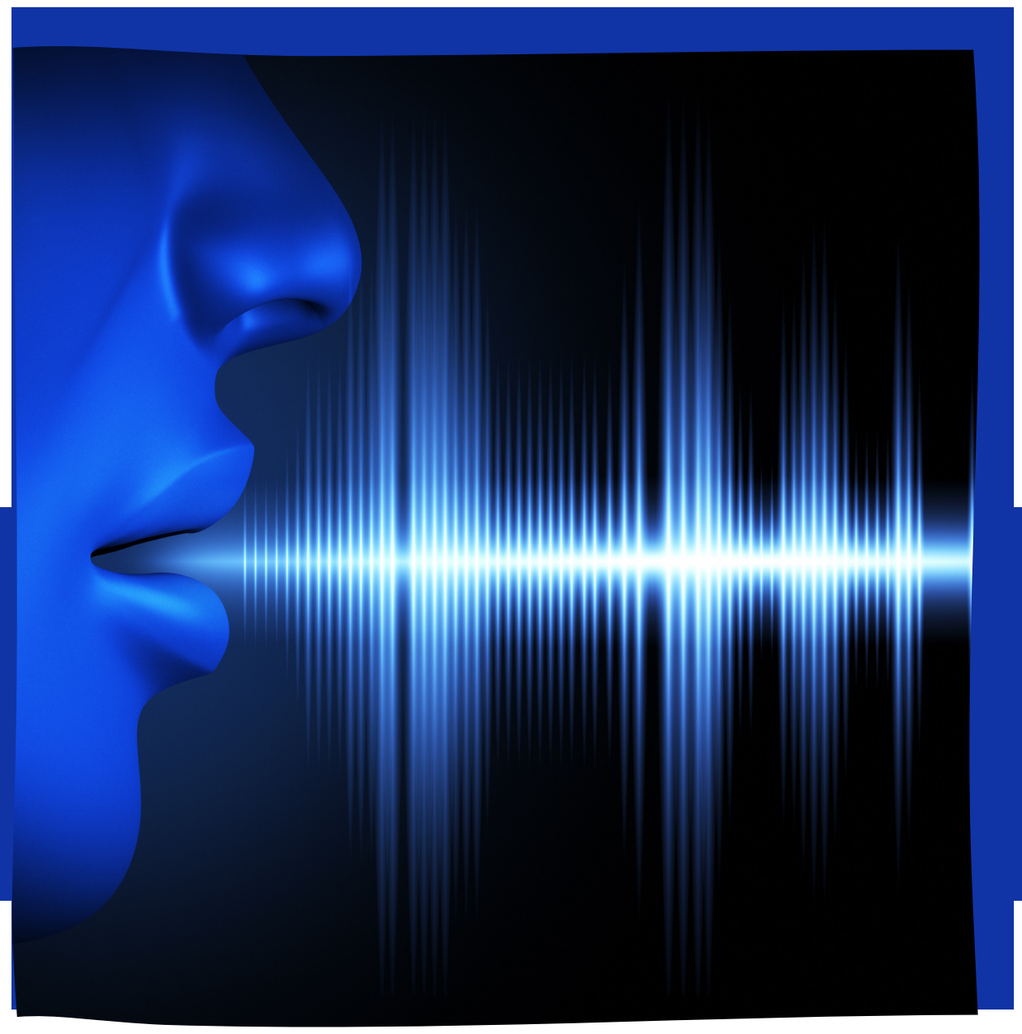
The team did strive hard to develop a product to make the lives of visually impaired people better. We do acknowledge their idea and the project, and we are sure that Drishti has the potential to do wonders.

A Voice Operated System

An Online IQ Test Platform for Visually Impaired

PROJECT 03

IMPLEMENTED BY:
DR VINAYA SAWANT
TARINI KULKARNI
TANUSHRI MALANI
SWEETY KAKADIYA



The need for such a system is that there are around 2 lakh visually impaired students in India alone. In a survey conducted to study the process of aptitude tests for visually impaired, it was found that there is no existing online system for the blind people to take an aptitude test. The existing system consists of a manual based test which is not a cost-effective solution for many blind NGO's. Therefore, in the motive of helping the visually impaired, we have developed an online, automated and completely voice assisted system for the visually impaired to take a multiple choice-based IQ test.

Technologies like Speech recognition, Text to speech, Image description and Face recognition have been implemented. The concept of deep learning has been used for image description to convert the images to speech with a very high accuracy. The existing screen readers do not provide image description with a good accuracy. Hence this system has been developed to assist the visually impaired in an easier and efficient way.

The designed system works in such a way that it overcomes the drawbacks of previously implemented technologies and enhances user experience and user interaction with the friendliness of the system. Proposed system takes dataset as an input, with underlying web technologies such as AJAX and JS enabling the loading of the web elements and features such as the text–to–speech and returns corresponding response. Selenium is being used for button click automation triggered by speech and to automate web browser interaction.

TTS and STT have also been implemented for the running and operation of the system. Session is used to store the result of each section in the database and display accordingly as and when needed. Certain algorithms have also been added to obtain the desired result, such as the Convolutional Neural Network and facial recognition. Image description is used in the spatial reasoning module of the test where the images of certain geometrical shapes are included in the questions and answers, they are converted to text using an image classification method.

The Team has also managed to publish the same in several reputed research organizations such as IJMTE, DJ ASCII as well as pending review in International Conference on Machine Learning and Smart Systems for Springer. The team won 2nd prize in DJ ASCII, which is a State Level Project Competition and was organized by DJ Sanghvi College of Engineering on 17th April 2021. About 75 teams from all over Mumbai had participated in this competition. The competition was held in 2 rounds. Round 1 was judged by the esteemed alumni of DJ Sanghvi. Out of 75, 10 teams were qualified for round 2. Round 2 was judged by 3 senior and experienced professors of 3 different colleges in Mumbai. Their expertise about the project has provided us with valuable insight, which will help grow and push the entire team's objective forward.

Vision and Language Navigation

Integrating Machine Vision and NLP for Indoor Navigation.

PROJECT 04

IMPLEMENTED BY:
PROF. PRACHI TAWDE
ANSH SHAH
PARTH KANSARA
PARTH MESWANI

The proposed system aims to design an algorithm that can be used to navigate any 3-D mapped environment, using the Matterport 3D Simulator by giving only minimal voice instructions. During the training phase, the nodes of a selected environment are traversed sequentially in the Simulator and an object recognition algorithm is applied on the panorama at each node. This helps in identifying and tagging the objects in the vicinity of each viewpoint. For the testing phase, a natural language instruction, specifying the goal location is taken as input. The goal location is identified from among the various viewpoints in the 3D environment by matching it to the tags generated in the testing phase. A shortest path algorithm is employed to navigate from the starting location to the goal location. The proposed system focuses on the implementation of the algorithm which combines natural language processing and computer vision and can be employed by agents for indoor navigation.
A person will precisely go to the kitchen and get a glass of water when asked to do so. However, for an agent, this is a complex task involving interpretation of human instructions and using it to navigate accordingly. This complexity of intermingling speech processing with computer vision is what has been a barrier in this domain. On this premise, the topic of Vision and language navigation, allows users to navigate a scene using natural language instructions and visual cues from the scene.

Initially a 3D scan is selected and given as an input to the Matterport Simulator. The 3D scan has various navigable viewpoints. To find the closest node to a location, we find out the percentage area of the bounding box with respect to the total area of the panorama.
Recognizing speech requires audio input, and Speech Recognition makes retrieving this input easy. For goal location extraction, we do Named Entity Recognition using a Bidirectional LSTM Named-entity recognition (NER).
The labels of detected landmarks along with percentage bounding box areas are stored at each node. Now suppose the user is initially at Node A, and inputs a voice instruction to go to the CHAIR. This extracted goal location is matched with the information stored at each node. As we can see, NODE D is the goal node because it has the largest percentage area of the bounding box of the chair. Then, we use Djikstra's Shortest path algorithm to navigate from the initial node A to goal node D.

Awards & Publications:

- Finalists for DJASCII 2021
- Published in NCECA (National Conference on emerging computer applications) 2021
- Shortlisted for ICAIML 2021
- Review Paper published in International Journal of All Research Education & Scientific Methods
(IJARESM), Feb 2021

VIRTUAL LABS
PROJECT 05

IMPLEMENTED BY:

RUSHANK SHAH
SOHAM DAVE
DEVIKA PATADIA
ANSH MEHTA
RICHA SHAH
DHRUVIL SHAH

Problem definition

As we all know, practical learning in any conceptual subject like Science plays a very important role in understanding the concepts of a particular experiment. At times when a learner cannot go to a physical lab for performing an experiment, there emerges a need for a virtual environment where he can simulate his experiments and can continue his learning no matter where he is and what device he is using for simulating the experiments.

Project description

Virtual Labs is a cross-platform simulation environment for practical experiments of Science subject (as of now) where a learner can perform his experiments in a virtual environment and can understand the different concepts behind it. In a situation where the learner cannot go to a physical lab, he can use this platform and with it's very intuitive and easy to use user interface and smooth user experience, he can perform this experiment and can understand the core concepts behind it.

Features:

➔ This is a cross-platform project, i.e. the project is available on desktop, mobile phones (both Android and iOS compatible) and tablets.

➔ The animations are very intuitive and feel true to life.

➔ Currently, the project serves for a virtual simulation environment for students of age 12-13 and hence the colour scheme is chosen in such a way that it would appeal to that age group

➔Users can change various knobs of the experiment and see the changes happen almost instantaneously.

➔One of the advantages of using a virtual environment is that even if the learner makes a mistake, he can rectify and then perform it practically to minimize his error.

➔The user can perform this experiment online in any browser of his choice for e.g., Safari or Chrome and the website is completely responsive for fitting itself in any screen size.

➔If viewed on an Android or iOS device, the user would be shown a screen to download the native app for the respective platform and redirect it to play store or app store depending on the platform.

➔The mobile app is completely offline based as of now and the app works smoothly at 60fps on any mobile phone.

➔Same as the web, the app is also completely responsive and looks good on any device you run it, be it a small screen smartphone or a massive tablet.

Tools used:

➔ Flutter
➔ Rive
➔ React JS
➔ Flare JS

VIRTUAL CHEMISTRY LAB

PROJECT 06

IMPLEMENTED BY:
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PRIYANG CHAURASIA
SWETA CHUDASAMA
VAIBHAVI UDANI
GAURI KHANOLKAR
SHIVAM VORA
CHAITANYA KUMBHAR
ALANKRIT ARYA
BHAVYA PATEL

Problem definition

In the ongoing pandemic, when it is difficult to visit schools and perform lab experiments, virtual labs play an important role in making the students understand the overall working of an experiment.
The student can perform the experiment on the handheld devices/laptop/desktop and simulate the entire experiment using the simulator.

Project description

The Chemistry Virtual Lab Simulator enables the user to perform the experiment demonstrating “Single Displacement Reaction” in a virtual environment providing a user-friendly interface. This enables the student to grasp the core concept clearly and assists the student to perform the experiment multiple times till he/she masters the concept/working of the experiment.

Features:

- The simulator is very student-friendly as it has color scheme most appealing to the school-going students(15-16 years)
- Drag and drop feature is implemented at 3 places where the student can drag the materials used to perform the experiment. This gives the student a feel of actually performing the experiment.
- In the simulator, a timer-based question is asked in between to test the understanding of the student.
- The user can perform the experiment on laptop/mobile as the simulator is responsive to both.
- The animation is highly intuitive which displays details intricately.
- Proper instructions/guidelines are provided wherever needed which enhances the user experience.

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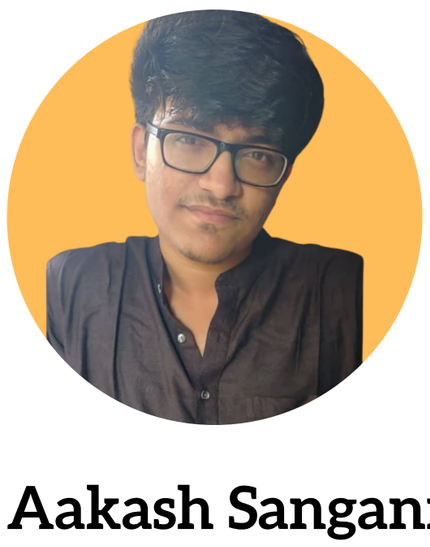

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