www.apsit.edu.in, volume #4, issue #1, 2021

OPCODE

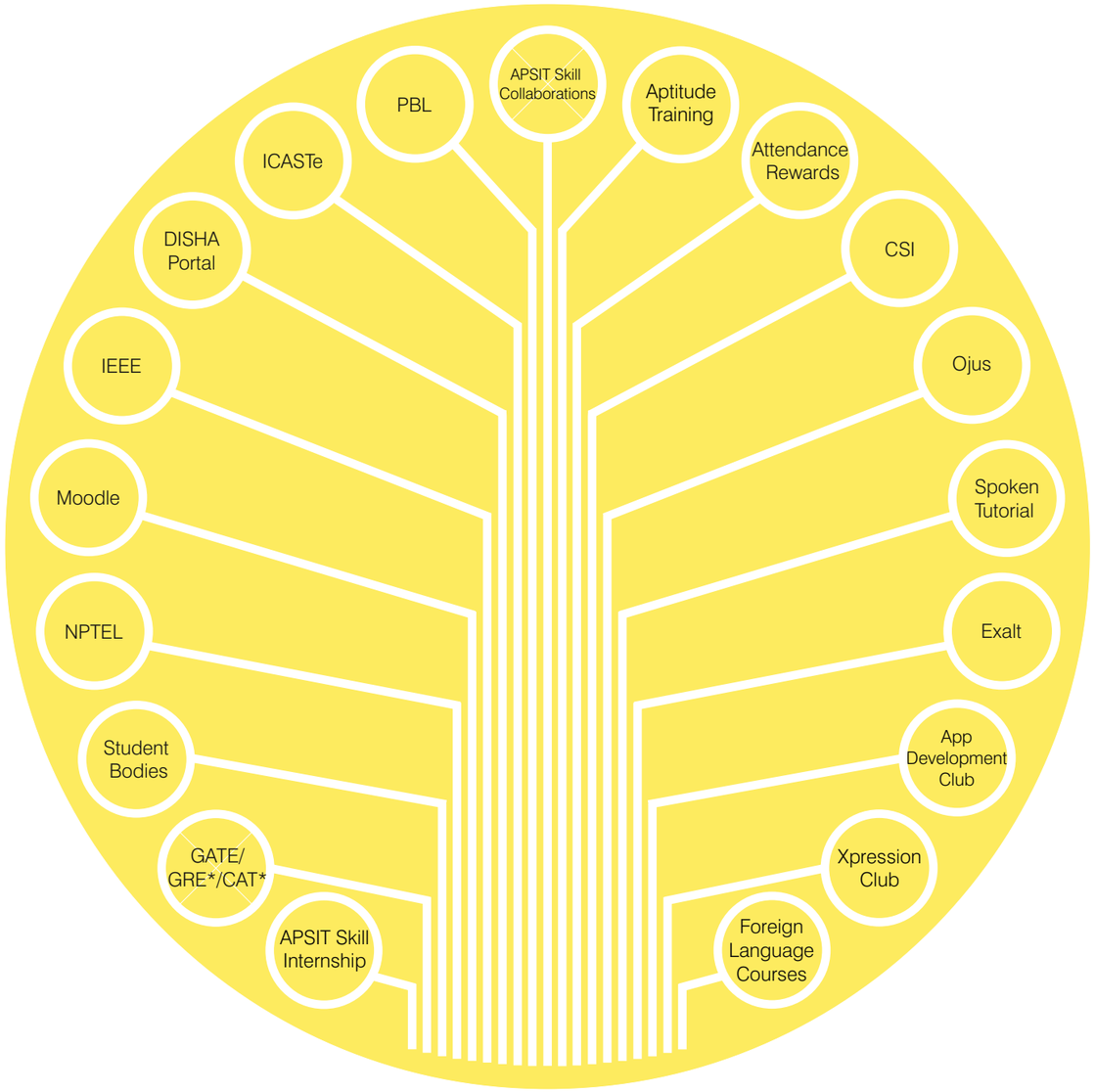
INLINE WITH TRENDS

Computer Engineering

NBA Accredited

DEPARTMENT OF
COMPUTER ENGINEERING

Parshvanath Charitable Trust's
A. P. SHAH INSTITUTE OF TECHNOLOGY, THANE
(Affiliated to Mumbai University, Approved by AICTE, DTE and Govt of Maharashtra)



From the Principal's Desk

It is very heartening to know that Computer Department is coming up with their digital magazine during this unprecedented Covid19 time. National Board of Accreditation(NBA) has recently accredited five undergraduate engineering courses / programs at A.P. Shah Institute of Technology, Thane. The courses accredited are Civil Engineering, Mechanical Engineering, Computer Engineering, Information Technology and Electronics & Telecommunication Engineering. I whole heartedly congratulate the Department for achieving NBA accreditation. The department has been applying the concepts of continuous program improvement and with the accreditation in place, I believe this will further enhance.

Technology is advancing day by day at a rapid pace like never before. There is always something new replacing the old that has become obsolete. With these fast changing technical contours and uncertain times we have no option but to keep ourselves updated, disciplined and be relevant by every passing day. University Curriculum coupled with value added programs and certifications are the need of the hour to bridge the gap between academia and industry. I would like to congratulate the faculties and students alike for efficiently utilizing this lock down period for upgrading themselves and completing global certifications. With this I convey my best regards to all who toiled to make this magazine a reality.

Dr. Uttam D Kolekar
PhD (Electronics and Telecommunication Engineering)

Computer Engineering

Vision

To become nationally reputed department producing universally competent engineers, to benefit sustained growth of an individual and the society at large.

Mission

1. To provide learning ambience for students and faculties through infrastructure, expertise and training.
2. To develop technically competent professionals with strong foundations, capable of adapting with the changing technologies for developing world class softwares.
3. To inculcate professional, social and ethical values in students by providing opportunities to solve environmental and social problems.

PREFACE

Dear Readers,

It is a matter of pride as well as pleasure to present before our readers the fourth issue of Computer Engineering Department's magazine. The Department has gone through accreditation process in February 2020 and has successfully been accredited by National Board of Accreditation for a period of three years. The department has also increased its intake to 180 from this academic year.

Our students have efficiently utilized this lock down period to upgrade themselves by doing global certifications, courses and internships and they have again proved their mettle by actively participating and winning prizes in technical and extra-curricular activities. Faculty have completed numerous training programmes , global certifications and made quality publications in this period. This magazine, indeed, is an honest effort to showcase all the departmental activities, student and faculty achievements in the academic year 2020-2021.The outstanding articles of our gifted and innovative minds are sure to captivate the imagination of the readers.

I would like to extend my sincere gratitude to our Chairman Mr.Chirag Shah, Trustee Mrs.Pooja Shah, other members of the Management, Principal Dr.Uttam Kolekar, Dean Academics Prof.Atul Deshpande, Dean Administration Dr.Sameer Naniwadekar for their ongoing support in all endeavours.I would like to congratulate and thank my faculty team for their every bit of service for the department and do expect the same in times to come. Congratulations to the members of editorial board and the students who combinedly helped in materializing the issue of 'Opcode'.

Prof. Sachin H Malave
Head of the Department

The Opcode Team

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APRIL 2021
VOLUME 4
ISSUE 1

Program Specific Outcomes

PSO1: Professional Skills: The graduate must be able to understand, analyze and develop computer programs, applications in the areas of Computer science and engineering.

PSO2: Problem-Solving Skills: The graduate must be able to apply standard practices and strategies in software project development to deliver quality products for industry, organization & society.

PSO3: Successful Career and Entrepreneurship: The graduate must be able to employ modern technologies in creating innovative career paths in an entrepreneurship, higher studies and jobs in industry.

Program Educational Objectives

PEO1: Graduate shall be competent to gain employment in global industry or pursue higher studies in premier universities.

PEO2: Graduate shall apply core competence in problem solving, analysis, Synthesis, Innovation to solve engineering problems in the global environment.

PEO3: Graduate shall demonstrate knowledge and skills learned in database management, data structures, Analysis of algorithms, Programming, Machine learning and allied technologies in the successful development of products, projects and processes.

PEO4: Graduate shall demonstrate leadership skills, professional ethics, Communication skills, interpersonal skills to work as effective team members in the professional practice.

PEO5: Graduate shall apply life skills and lifelong learning to lead a successful individual life and a responsible citizen to contribute towards development of society and country.

EVENTS

NBA Accredited !

The department of Computer Engineering has been accredited by the National Board of Accreditation (NBA) for a period of three years recently along with departments of Civil Engineering , Electronics & Telecommunication Engineering, Information Technology and Mechanical Engineering, .

To ensure quality of education, APSIT went through the accreditation process of National Board of Accreditation (NBA) for the eligible UG courses. The NBA Expert Committee visited the institution on 14th,15th and 16th February 2020 for NBA Accreditation of 5 UG programmes. The expert team of NBA critically appraised the institute's programs through a rigorous assessment process to ensure if the programs meet the standards of quality education. Experts also had an interaction with various stakeholders like faculty members, staff members, students, alumni members, recruiters, and parents. The NBA peer teams expressed their satisfaction over almost all the facilities, teaching-learning processes, student performance; motivation levels of the teachers and thereby, the potential of the college for excellence.

Intake Tripled !

The department has also increased its intake to 180 from the academic year 2020-2021.The department believes that accreditation will further enhance the quality of the teaching-learning processes.

Events
DRUPAL

Events
CMESA

DEPARTMENTAL EVENT

AICTE ISTE Approved One Week Online Faculty Development Programme on “Drupal”

The Department of Computer Engineering organized an AICTE-ISTE approved One Week Online Faculty Development Programme on “Drupal” in association with the “Spoken Tutorial Project” , Indian Institute of Technology, Bombay from 27/04/2020 to 02/05/2020.The FDP was organized with an objective to help minimize the impact of the COVID-19 outbreak on faculty.

Spoken Tutorials are free audio-video learning materials which are created for self learning and can be used without the internet. This training was offered by the Spoken Tutorial Project, IIT Bombay, funded by National Mission on Education through ICT, MHRD, Govt., of India. The set of 20 tutorial videos covered features and usage of Drupal version 8.x. Drupal is one of the best solutions for people who want to build a feature-rich website and is one of the most adaptive systems available today which is used by developers as both a CMS and a broad web development platform.

Participants could listen to these spoken tutorials and practise by reproducing all the steps shown in the video side-by-side. Passing an online exam, conducted remotely from IIT Bombay, was a prerequisite for completing this training. 40 participants completed the course successfully.

Departmental Societies/Student Chapters

Lead, Serve and Inspire @ APSIT

Involvement in student associations and chapters causes student leadership development. It creates a sense of responsibility, independence, satisfaction and more positive attitude to life.

Computer Engineering Students Association

CMESA is an integral part of the educational mission of the department. As the center of the department community life, CMESA complements the academic experience through an extensive variety of cultural, educational, social, and recreational programs. These programs provide the opportunity to balance course work and free time as cooperative factors in education

President : Mr. Aaditya Muley

The President shall have the general responsibility for coordinating the activities of CMESA and for directing and overseeing the publicizing of the affairs of the Student Body. He shall preside at all Student Council meetings.

Vice President : Miss. Amruta Koshe

The Vice-President shall share the duties and responsibilities of the President and coordinate the activities of CMESA.

Secretary : Miss. Janhavi Anap

The Secretary shall be responsible for recording the minutes and acting as official timekeeper of all CMESA meetings. The Secretary shall maintain the permanent records of the Student Council and he/she will assist the President and Vice-President. She shall preside at Student Council meetings in the absence of the President and Vice-President.

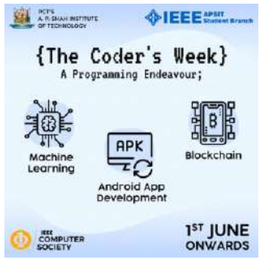
Treasurer : Mr. Rakshit Shah

The Treasurer shall be the custodian of the Student Association’s funds. He/She shall keep all financial records, disburse funds, and present monthly and annual accounts of financial status of the Student Association .

The department congratulates the members of CMESA 2019-20 , President Mr.Aditya Joshi , Vice-President Mr.Anmol Majithia, Secretary Mr.Ashwin Shenolikar and Treasurer Ms.Sanika Chavan for their efforts and successful completion of term.

IEEE EVENTS

THE CODER'S WEEK



An online programming endeavour, The Coder's Week, was held by IEEE APSIT SB CS Chapter. It took off on 1st June 2020, with the volunteers working from home due to lockdown restrictions. It is worth noting that this was the first ever large scale event by our SB, let alone one held online. It concluded almost a month later, with the announcement of winners. 600+ participants from all over the world took part, out of which 140 participants completed the entire learning curve

The Coder's Week consisted of three tracks, namely Machine Learning, Blockchain and Android App Development. With an eye on beginners as well as to brush up on the novices, the event was divided in two phases -

Learning phase

Project phase

The learning phase was of 6 days, in which carefully curated online learning material like YouTube videos, documents, links to GitHub repositories and important websites were provided. Each day, participants had to complete a task pertaining to a dedicated topic and update it to their respective GitHub repositories. The ones who completed all the tasks on time, or did not slip for more than two times, were allowed to continue to the next phase.

For the project phase, the participants were provided with three ideas. They could choose any of those, or come up with an entirely new idea themselves, pertaining to their domain. They had to complete the chosen project within three days and push it on GitHub. A form was circulated, which collected their details and the GitHub link.These projects were narrowed down to the ten best by our college faculty, and sent for further consideration to the judges, which were all IEEE CS YP volunteers. They included Mr Anand Jagadeesh, Mr Vinod Sharma, Mr Nikhil Karande and Mr Vignesh Hari. The top 10 participants had to present their projects before the judges, out of which the best three were chosen from each track.

The winners of each track were gifted with a cash prize, certificate, goodies from IEEE and mentorship from a YP of IEEE CS. The top contestant from each track additionally won an Amazon gift card worth INR 2,000. Every participant also received a one-month worth of free access to Qwiklabs.

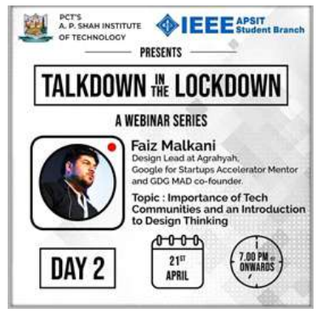
The Coder's Week proved to be an important stepping stone for our SB as a whole, with lessons learnt there guiding us in all our future events, especially the next big one, ApScript.

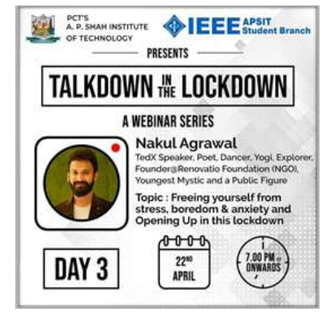
Events

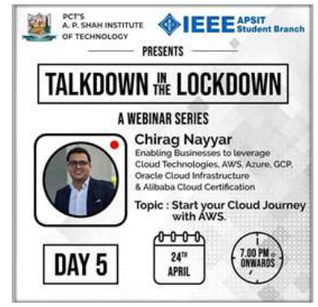
IEEE EVENTS

IEEE EVENTS

TALKDOWN IN THE LOCKDOWN







IEEE APSIT organised an eclectic webinar series titled 'Talkdown In The Lockdown', from 20th to 24th April 2020. It was the SB's first ever online event, and was targeted towards students as well as young professionals. The webinar series was live streamed on YouTube, using StreamYard application. The five-day event garnered 100+ median views.

Talkdown In The Lockdown was an important event for us as an SB, since it gave an insight into the things that were to come. In the coming months, all of our events took off online and the experience gained from this event proved crucial.

Events

IEEE EVENTS

IEEE EVENTS

WOMEN IN LEAD

IEEE APSIT WIE AG conducted an immersive webinar series titled 'Women In Lead' from 15th to 17th June 2020. It was the SB's first ever collaborative effort, with the WIE AGs of Universal College, Sandip Foundation and VJTI being the partners. The entire event was held with the support of IEEE Bombay Section. The three-day, six-session webinar series garnered 45+ median participants. It was held on Google Meet platform, and featured an exciting mix of women leaders and volunteers.

IEEE EVENTS

APSCRIPT

IEEE APSIT organised its biggest event yet with a 48-hour hackathon extravaganza, ApScript. The event got favourable reception from 586 participants, who were divided into 113 teams. It was supported by almost 100 campus ambassadors and 26 sponsors and community partners. Rewards worth INR 10,00,000 were bestowed in this event.

Tracks:

Four tracks were featured in ApScript, to make it accessible and pleasing:

- Blockchain
- Machine Learning
- App Development
- Web Development

Rounds:

To make our hackathon as elaborate and competitive as possible, ApScript was divided into three rounds. The problem statements were provided at the start itself. The rounds were as follows -

IEEE EVENTS

APSCRIPT

Round 1: The participants made a video of less than three minutes, presenting their solution and detailed documentation. The top 50% teams progressed to the next round.
Round 2: The participants presented their solution model to the judges on Google Meet platform. The judges allocated points and gave suggestions for improvements. Top 15 teams progressed to the next and final round.
Round 3: The final, complete models, incorporating the suggestions of judges in the previous round, were presented before the judges.

The judges for each track were all experienced professionals, with a few being IEEE volunteers. Each track had 3-4 judges, who also doubled as mentors.

Workshops:

A few workshops were held to get the participants warmed up and more knowledgeable.
Pre-hackathon workshops:

1. Mr Jeet Dagha, *IEEE Bombay Section YP Chair, Recipient - IEEE India Council Outstanding YP Volunteer Award 2020*
   Topic: Benefits of IEEE membership
2. Mr Mudit Marda, *Blockchain specialist, DApps builder for Tezos ecosystem*
   Topic: Blockchain technology
3. Mr Anuj Garg, *Co-founder - Code for Cause*
   Topic: Web Development With Or Without React
4. Sanket Singh, *from CodeChef community*
   Topic: Importance of Competitive Coding in all aspects

Post-hackathon workshop (only for Round 1 qualified participants):

1. Mr Ali Mustufa Shaikh, *Intel Software Innovator*
   Topic: Intel Course

Prizes:

The top three participants from each track were declared winners of the respective tracks. The details of the prizes are as follows:

1st Prize: Cash prize worth INR 2,500; Microsoft Azure coupon worth INR 7,500; discount coupons from Coding Blocks and vouchers from Coding Ninjas; internship opportunity at The Workable and Matic; The Wolfram Award; free ebook by Packt and a certificate.
2nd Prize: Coupons from Coding Blocks; free one year InterWebs.Host personal subscription; The Wolfram Award; internship opportunity at The Workable and Matic; and a certificate.
3rd Prize: Coupons from Coding Blocks; free one year InterWebs.Host personal subscription; The Wolfram Award; internship opportunity at The Workable and Matic; and a certificate.
All participants: Vouchers from Coding Ninjas; an Intel Software Innovators workshop; 90-day trial code for Balsamiq Cloud; 50% discount on InterWebs.Host; free 30-day access to Interview Cake's full coding interview prep course; free one year JetBrains subscription; INR 10,000 for best hack on Etherium and INR 15,000 for Etherium+Matic; free 30-day access to Wolfram|One; INR 20,000 for best Dapp built on Tezos and USD 200 for for best Dapp built on Portis; and a certificate.

For an in-depth look at our prizes, please visit our event website
https://ieee.eventsapsit.org/Apscript

ApScript provided tremendous exposure for our SB as a whole. Our volunteer members got an excellent opportunity for networking. We pushed ourselves each day to ensure its success, and the glowing reviews that we got at the end showed that our efforts had borne fruit.

PERFORMANCE

ACADEMIC PERFORMANCE

When it comes to displaying results the students perform exceptionally well.
As evident our results are constantly on the upward trajectory. We are very proud of the achievements of our pupils. This has been possible because of the smart teaching methodologies and the time intensive planning and effort put in by our students and faculties

Topper's List (SE,TE, BE) (First three rank holders)

SEM III

RANK	NAME	CGPA
1	Hegde Chirag	10
	Heniya Nidhi	10
	Jaroli Nishchay	10
	Narkar Riddhi	10
	Porwal Rahil	10
	Shah Meet	10
	Sharma Ishani R	10
2	Jain Jayesh	9.85
	Anap Janhavi	9.85
	Jain Rutuja	9.85
	Kargutkar Aniket	9.85
	Parakh Hemant	9.85
	Singh Nidhi	9.85
	Singh Shauryan	9.85
	Yadav Aditya	9.85
3	Jain Devansh	9.74
	Jain Prince	9.74
	Patel Het	9.74
	Totey Aarya	9.74

SEM V

RANK	NAME	CGPA
1	Bangale Sayali	10
	Khedekar Sejal	10
	Menon Shyamkrishnan	10
2	Nair Siddharth	9.93
	Vora Parth	9.93
3	Gogri Ashay	9.85
	Jadhav Manasi	9.85
	Kamani Dhruvin	9.85
	Masur Anjali	9.85
	Shah Vansh	9.85

SEM VII

RANK	NAME	CGPA
1	Dhanjal Prabhjyot	10
2	Kulkarni Shambhavi	9.85
	Bafna Himanshu	9.85
	Balekundri Amey	9.85
3	Gupte Ashlesh	9.19

List of Students Pursuing Higher Studies (2020 Pass out Batch)

Sl No	Name of the Student	Name of the Institute
1	Mrunal S Jadhav	University of Alberta, Canada
2	Ashwin R Shenolikar	Virginia Tech, USA
3	Gauri Deshpande	SDA Bocconi School of Management, Milan
4	Tanmay Sule	IISC , Banglore
5	Siddhesh Kokane	University of Strathclyde, Scotland
6	Vatsal Panchal	Dublin business School, Ireland
7	Aishwarya S Muchandi	University of Texas Arlington, USA
8	Nakulesh Jayakrishnan	University of Houston, USA
9	Pratik Jain	Rutgers the State University of New Jersey, USA
10	Pradipt Kalamkar	New York University, USA

Result Analysis

Academic Year	FE	SE	TE	BE
17-18	91.37	98.43		
18-19	95.31	86.84	100	
19-20	90.32	83.33	88	100

Students who got placed in 2020-21:

Sr No.	Student Name	Employer Name
1	Asmita Shelke	TCS
2	Anooj Bhalchandra Sarvankar	1) LTI 2) Capgemini
3	Prabhjyot Singh Saranjit Singh Dhanjal	LTI
4	Ritika Vinayak Rane	LTI
5	GAURAV MAKARAND SAMANT	Capgemini
6	Jash Paresh Vora	Capgemini
7	Hemanshu Mukesh Bafna	Hexaware
8	Purti Rohit Lalan	TCS
9	Shambhavi Prafulla Kulkarni	1) TCS 2)A One Salasar
10	Komal Dinesh Lonkar	Neosoft Technologies / Headstrait
11	Pitale Prathamesh Sanjay	TCS
12	Ankit Rakesh Srivastava	Capgemini
13	Mansi Girishchandra Maurya	LTI
14	Chirag Ramesh Sable	Hexaware
15	Anshul Anil Khairnar	Capgemini
16	Saloni Pawan Jackeray	1) L&T 2)Capgemini
17	Gunjan Singh	TCS
18	Amruta Atul Deshpande	1)LTI 2)Capgemini
19	Sanika Ramchandra Chavan	Capgemini
20	Shreya Abhaykumar Choudhary	1)Capgemini 2)TCS
21	Ujjwal Hemant Jain	Headstrait Software
22	Mansi-Prabhakar-Devrukhkar	Headstrait Software
23	Anjani Sruti Doradla	1. LTI 2. Capgemini
24	Bhavin Kalsariya	Headstrait
25	Pooja Rajesh Maniyar	Q Spiders/A One Salasar
26	Apurva Ajit Patil	1) Capgemini 2) TCS
27	Shreya Mahendra Chaudhari	LTI
28	Amey Girish Balekundri	Headstrait
29	Shail Devang Shroff	Headstrait
30	Bhavik Anil Jain	qspiders/A One Salasar
31	Rishabh Mahendra Mehta	A One Salasar
32	Anmol Singh Majithia	Virtusa
33	Veda Manoj Kowale	Qspiders,A1 salasar
34	Jatin Durgaprasad Saini	1)Capgemini 2)TCS 3)Virtusa 4) LTI

Performance
INTERNSHIP

Students who completed Internship successfully:

Name of the Student	Company Name	Duration
Nidhi Munavalli	EXPRTIE Technologies pvt. ltd,Bengaluru	10/07/2020 - 31/08/2020
Vatsal Mehta	Skillingyou Edtech	March 2020 - Dec 2020
Kevin Khimasiya	Digitech solutions	Jan 2021 - March 2021
Yash Shirish Mehta	Modern Impex	Jan 2021 - March 2021
Shrenik Jangada	Codemugg Inc	Dec 2020 - Mar 2021
	Pradnya Consultant	Oct 2020 - Dec 2020
Aryan Singh	IIT Bombay	April 2020 - Aug2020
Nidhi Vanjare	Fairy Digital	Aug 2020 - Aug 2020
Aaditya Muley	medID	Nov 2020 - Dec 2020
Vaibhav Shukla	Apsit Skills Holistic Internship Program	Aug 2020 - Sept 2020
Parth Vora	Campus Ambassador Internship at E-cell IIT Bombay	Jul-20
	Apsit Skills Holistic Internship Program	June 2020 - July 2020
Yash Jain	Apsit Skills Holistic Internship Program	Aug 2020 - Sep 2020
Attal Kaushal	Apsit Skills Holistic Internship Program	June 2020 - July 2020
Dhruvin Kamani	Upkey's VIP Internship Certification	May 2020 - June 2020
Jain Yash Jugnu	Apsit Skills Holistic Internship Program	01/08/2020 - 15/09/2020
Bangale Sayali	Apsit Skills Holistic Internship Program	18 weeks(June 2020 - Sep 2020)
Jatin Saini	Virtusa	May 2020 - Aug 2020
Anooj Sarvankar	Virtusa	May 2020 - Aug 2020
Ritika Rane	Sigmaflux	March 2020 - Sep 2020

ACHIEVEMENTS

FACULTY ACHIEVEMENTS

Faculties play an important role in shaping the future and image of an institution. It is the effort of the faculty which makes an institution recognized with all his or her teaching excellence and research orientation. Our teachers are the pillars of strength. They have encouraged and helped students develop a well groomed personality. Our faculties are also actively involved in research and their highly cited papers are proof to this.

Dr. Rahul Ambekar

1. STTP/FDP/Seminar/Workshop Attended:
    1) UGC Paramarsh Online Faculty Development Program on NAAC Assessment and Accreditation from 21/05/2020 to 26/05/2020
    2) 3 Weeks FDP on NBA Accreditation 8 Credit Course on Outcome Based Education Faculty Development Program from 24/03/2020 to 14/04/2020.

2. Swayam/NPTEL/Coursera/Udemy or any other course completed:
    1) AI for everyone
    2) Cloud Computing
    3) Introduction to Philosophy.
    4) Contract Tracing.
    5) Project Management
    6) Resume Writing
    7) Covid 19

3. Any other achievements:
    1) Admitted in MBA program
    2) Consultant to St.Xavier Engineering college for NBA Accreditation

Achievements
Technical

Dr. Pravin Adivarekar

1. STTP/FDP/Seminar/Workshop Attended:

    1) 7-days Faculty Development Program on R training Certification from Spoken Tutorial, IIT Bombay (27th April to 3rd May 2020).
    2) Participated in Five Days Online Faculty Development Program on "Research in Engineering - A Way Forward"conducted from 6 to 10th July, 2020 at A. P. Shah Institute of Technology, Thane.
    3) ISTE Approved Online STTP on "Cyber Security: Individual, Technology and Research Trends" during 21-06-21 to 26-06-21 organized by Vidyavardhini College of Engineering.
    4) Completed ISTE approved Online/SF-STTP/FDP Programme on “Data Science with Python” held during 10.05.2021 to 14.05.2021 organized by D. Y. Patil College of Engineering & Technology, Kolhapur, Maharashtra

2. Swayam/NPTEL/Coursera/Udemy or any other course completed:

    1) Python Data Structures
    2) Programming for Everybody (Getting Started with Python)
    3) Fundamentals of Network Communications
    4) Planning for your Google Workspace deployment
    5) Google Workspace Mail Management
    6) Google Workspace Security
    7) Managing Google Workspace
    8) Neural Networks and Deep Learning
    9) Using Python to Access Web Data

3. Resource Person/Expert Talk delivered:

    1) 3 day STTP at S.S.Jondhle polytechnic
    2) 3 day Workshop at S.S.Jondhle polytechnic

Achievements
Technical

Prof. Sukhada Aloni

1. STTP/FDP/Seminar/Workshop Attended:

    1) 1-Month International Faculty Development Program on Environment and Sustainability.(01/05/2020 to 31/05/2020)
    2) 6-Days Faculty Development Program on Introduction to Cyber Security by ICT Academy.(30/04/2020 to 05/05/2020)
    3) 7-days Faculty Development Program on Drupal training Certification from Spoken Tutorial,IIT Bombay (27th April to 3rd May 2020)
    4) Faculty Development Program on Linux Training Certification from Spoken Tutorial,IIT Bombay(20th April,2020)
    5) 5-days Faculty Development Program on Research in Engineering-A Way Forward conducted by A. P. Shah Institute of Technology(06/07/2020 to 10/07/2020)

2. Swayam/NPTEL/Coursera/Udemy or any other course completed:

    1) Programming for Everybody(Getting started with Python)
    2) Capstone:Retrieving, Processing and Visualizing Data with Python
    3) Using Python to Access Web Data
    4) Python Data Structures
    5) Google Cloud Platform Fundamentals:Core Infrastructure
    6) Essential Google Cloud Infrastructure Foundation

Achievements
Technical

Prof. Archana Kotangale

1. STTP/FDP/Seminar/Workshop Attended:

    1) 5 days online FDP on "Research in Engineering-A way Forward" conducted from 6th to 10th July 2020 at A.P.Shah Institute of Technology,Thane
    2) Faculty Development Program on Linux Training Certification from Spoken Tutorial,IIT Bombay(20th April,2020)

2. Swayam/NPTEL/Coursera/Udemy or any other course completed:

    1) Managing Big Data with MySQL Coursera course by Duke university
    2) Programming for Everybody (Getting Started with Python)
    3) Relational database systems Coursera course
    4) SQL for Data Science
    5) Data Science Math Skills
    6) Grammar and Punctuation Coursera course by UCI
    7) Artificial Intelligence with Machine Learning certificate course of Oracle Academy

3. Conference/Journal Paper Publication Details:

    1) Title: Multichannel Attendance Management System using QR Code and Location published in: International Journal of Scientific Research in Computer Science, Engineering and Information Technology

Prof. Brinal Colaco

1. STTP/FDP/Seminar/Workshop Attended:

    1) 5 days online FDP on "Research in Engineering- A way Forward" conducted from 6th to 10th July 2020 at A.P.Shah Institute of Technology,Thane
    2) 6 days STTP on "Programming in JAVA" conducted from 13th to 18th July 2020 at Thadomal Shahani Engineering College, Bandra

2. Swayam/NPTEL/Coursera/Udemy or any other course completed:

    1) The bits and bytes of computer networking
    2) Blockchain Basics
    3) Technical support fundamentals
    4) Docker essentials

3. Conference/Journal Paper Publication Details:

    Published a paper entitled “A comparative review between programming tools used in data science.” in IJCRT,Volume 8,Issue 9,September 2020.

Achievements
Technical

Prof. Amol Kalugade

1) STTP/FDP/Seminar/Workshop Attended:

    1) 5 days Data Science and Big Data Analytics from APSIT,Thane

2) Swayam/NPTEL/Coursera/Udemy or any other course completed:

    1) Architecting with Google Kubernetes Engine:Foundations
    2) Architecting with Google Kubernetes Engine:Production
    3) Google Cloud PlatformFundamentals: Core Infrastructure
    4) Architecting with Google
    5) Kubernetes Engine: Workloads
    6) Complete Guide to Elasticsearch
    7) Docker Mastery: with Kubernetes +Swarm from a Docker Captain
    8) Docker and Kubernetes: The Complete Guide
    9) Elasticsearch 7 and the Elastic Stack: In Depth and Hands On.
    10) Data Processing with Logstash and Filebeat
    11) Complete ElasticSearch with LogStash, Hive, Pig, MR & Kibana
    12) Apache Kafka Series - Learn Apache Kafka for Beginners v2
    13) Apache Kafka Series - Kafka Connect Hands-on Learning
    14) Apache Kafka Series - Kafka Streams for Data Processing
    15) Apache Kafka Series - Confluent Schema Registry & REST Proxy
    16) Postman: The Complete Guide - REST API Testing
    17) Apache Kafka Series - KSQL on ksqlDB for Stream Processing
    18) Apache Kafka Series - Kafka Monitoring & Operations
    19) Apache Kafka Series - Kafka Cluster Setup & Administration
    20) REST API Design, Development & Management
    21) Data Visualization with Kibana
    22) Certified Kubernetes Administrator (CKA) with Practice Tests
    23) Learn DevOps: The Complete Kubernetes Course

Achievements
Technical

Prof. Mayuri Jain

1. STTP/FDP/Seminar/Workshop Attended:

    1) 1-Month International Faculty Development Program on Environment and Sustainability.(01/05/2020 to 31/05/2020)
    2) 6-Days Faculty Development Program on Introduction to Cyber Security by ICT Academy.(30/04/2020 to 05/05/2020)
    3) 7-days Faculty Development Program on Drupal training Certification from Spoken Tutorial,IIT Bombay (27th April to 3rd May 2020)
    4) Faculty Development Program on Linux Training Certification from Spoken Tutorial,IIT Bombay(20th April,2020)
    5) 2-Days Faculty Development Program on Game Pedagogy in OBE from K. C. College of Engineering.(11/06/2020 to 12/06/2020)
    6) ICT Academy Fundamentals of AI (Online Live FDP)

2. Swayam/NPTEL/Coursera/Udemy or any other course completed:

    Programming for Everybody (Getting started with Python)

3. Specialization Courses/Global Certifications
    1) Google Educator Level 1

4. Resource Person/Expert Talk delivered:

    1) 3 day STTP at S.S.Jondhle polytechnic
    2) 3 day Workshop at S.S.Jondhle polytechnic

Achievements
Technical

Prof. Merlin Priya Jacob

1) STTP/FDP/Seminar/Workshop Attended:

    1) 1-Month International Faculty Development Program on Environment and Sustainability.(01/05/2020 to 31/05/2020)
    2) 6-Days Faculty Development Program on Introduction to Cyber Security by ICT Academy.(30/04/2020 to 05/05/2020)
    3) 7-days Faculty Development Program on Drupal training Certification from Spoken Tutorial,IIT Bombay (27th April to 3rd May 2020
    4) Faculty Development Program on Linux Training Certification from Spoken Tutorial,IIT Bombay(20th April,2020)
    5) 5-days Faculty Development Program on Research in Engineering-A Way Forward conducted by A. P. Shah Institute of Technology(06/07/2020 to 10/07/2020)
    6) AICTE Sponsored STTP on Developing R&D Culture in Educational Institutes through Project Based Learning(19/10/2020-24/10/2020)

2) Swayam/NPTEL/Coursera/Udemy or any other course completed:

    1) Programming for Everybody(Getting started with Python)
    2) Capstone: Retrieving, Processing and Visualizing Data with Python
    3) Using Python to Access Web Data
    4) Python Data Structures
    5) Google Cloud Platform Fundamentals: Core Infrastructure
    6) Essential Google Cloud Infrastructure Foundation

Achievements
Technical

Prof. Sachin Balawant Takmare

1. STTP/FDP/Seminar/Workshop Attended:

    1) Online one week FDP on "NAAC Assessment and Accreditation" conducted by Shri Shivaji College, Parbhani during 21-26 May 2020.
    2) 5 days online FDP on "Research in Engineering-A Way Forward" conducted from 6th to 10th July 2020 at A.P.Shah Institute of Technology,Thane

2. Swayam/NPTEL/Coursera/Udemy or any other course completed:

    Courses done on platform https://www.coursera.org
    1) Full-Stack Web Development with React Specialization
    2) Graphic Design Specialization
    3) Elastic Google Cloud Infrastructure: Scaling and Automation
    4) Google Cloud Platform Fundamentals: Core Infrastructure
    5) Front-End Web Development with React
    6) Design and Make Infographics (Project-Centered Course)
    7) Learning to Teach Online
    8) Use WordPress to Create a Blog for your Business
    9) Front-End Web UI Frameworks and Tools: Bootstrap 4
    10) Essential Google Cloud Infrastructure: Core Services
    11) Server-side Development with NodeJS, Express and MongoDB
    12) Multiplatform Mobile App Development with React Native
    13) Essential Google Cloud Infrastructure: Foundation
    14) Fundamentals of Graphic Design
    15) Introduction to Imagemaking
    16) Ideas from the History of Graphic Design
    17) Write Professional Emails in English
    18) Introduction to Typography
    19) Elastic Google Cloud Infrastructure: Scaling and Automation
    20) 20.AI For Everyone
    21) How to Write and Publish a Scientific Paper (Project-Centered Course)
    22) Meditation: A way to achieve your goals in your life
    23) Reliable Google Cloud Infrastructure: Design and Process
    24) Science of Exercise
    25) Weight Management: Beyond Balancing Calories
    26) Fundamentals of Network Communication
    27) How to Write a Resume (Project-Centered Course)

Achievements
Technical

3. Specialization Courses/Global Certifications:

    Graphic Design Specialization Certificate
    Course Certificates Completed under this Specialization
    1) Introduction to Typography
    2) Brand New Brand
    3) Ideas from the History of Graphic Design
    4) Fundamentals of Graphic Design
    5) Introduction to Imagemaking

    Full-Stack Web Development with React Specialization Certificate
    Course Certificates Completed under this Specialization
    1) Front-End Web UI Frameworks and Tools: Bootstrap 4
    2) Front-End Web Development with React
    3) Multiplatform Mobile App Development with React Native
    4) Server-side Development with NodeJS, Express and MongoDB

4. Any other achievements:

    Huawei Certification of Artificial Intelligence, 06 Sep, 2020.

Achievements
Technical

Prof. Ramya R B

1. STTP/FDP/Seminar/Workshop Attended:

    1) 4 weeks(May 1 to May 31 2020) International FDP on Environment and Sustainability (OE4BW) from D.Y Patil College of Engineering Akurdi
    2) 7-days Faculty Development Program on Drupal training Certification from Spoken Tutorial,IIT Bombay (27th April to 3rd May 2020)
    3) Faculty Development Program on Linux Training Certification from Spoken Tutorial, IIT Bombay(20th April,2020)
    4) 5 days National Online Faculty Development Program on “Artificial Intelligence" organized by Department of Information Technology, Universal College of Engineering during 22.05.2020 to 26.05.2020.
    5) Five Days Online Faculty Development Program on "Researchin Engineering - A Way Forward” conducted from 6th to 10th July, 2020 at A. P. Shah Institute of Technology, Thane.
    6) HCIA-AI training from 14.09.2020 to 25.09.2020
    7) Six days STTP on Developing R&D Culture in education institutes through PBL (Part -I) organized by Poornima College of Engineering Jaipur from 18.10.2020 to 24.10.2020
    8) Attended a hands-on workshop on Robotic Process Automation conducted by LeadingIndia.ai by Bennet University, Noida from 04.05.2020 to 08.05.2020.
    9) Attended a 3 days online workshop on "Education 4.0" organized by IQAC, Atharva College of Engineering held on 28th - 30th April 2020.

2. Swayam/NPTEL/Coursera/Udemy or any other course completed:

    1) RPA Starter UI Path
    2) RPA Implementation Manager Foundation UI Path
    3) Cyber Security Foundations from Palo Alto Networks Cyber Security Academy
    4) Machine Learning for Business Professionals by Google Cloud, Coursera
    5) Crash Course on Python, Google - Coursera
    6) Take Your English Communication Skills to the Next Level, Georgia Institute of Technology, Coursera
    7) Introduction to Data Science in Python,University of Michigan, Coursera

Achievements
Technical

3. Specialization Courses/Global Certifications:

    1) Google Educator Level 1
    2) HCIA-AI
    3) Google IT Support Specialization from Coursera
    4) Introduction to Scripting in Python from Coursera

4. Conference/Journal Paper Publication Details:

    1) Presented paper titled Crop Water Requirement Prediction in Automated Drip Irrigation System using ML and IoT in ICNTE 2021 organized by Fr C Rodrigues Institute of Technology, Vashi in association with IEEE and IAS on January 15 and 16th 2021.

Achievements
Technical

Prof. Sofia Mujawar

1. STTP/FDP/Seminar/Workshop Attended:

    1) 5 days online FDP on "Research in Engineering-A way Forward" conducted from 6th to 10th July 2020 at A.P.Shah Institute of Technology,Thane
    2) 7-days Faculty Development Program on Drupal training Certification from Spoken Tutorial,IIT Bombay (27th April to 3rd May 2020)
    3) Faculty Development Program on Linux Training Certification from Spoken Tutorial,IIT Bombay(20th April,2020)
    4) Faculty Development Program on Networking Essentials by ICT Academy from 14.06.2020- 20.06.2020

2. Swayam/NPTEL/Coursera/Udemy or any other course completed:

    1) 7week Google Coursera Certification in Programming for Everybody(Getting Started with Python) (25/06/2020)
    2) 6 weeks Google Coursera Certification in Technical Support Fundamentals (20/06/2020)
    3) Project based online learning for “Machine Learning using Python” from SkyFi Labs.(18/06/2020)
    4) 6 weeks Google Coursera Certification in Bits and Bytes of Computer Networking (17/4/2020)

3. Specialization Courses/Global Certifications:

    1) Certified Blockchain Expert from Blockchain Council(29/06/2020)

Achievements
Technical

Prof. Jaya Gupta

1. STTP/FDP/Seminar/Workshop Attended:

    1) 7 days online STTP on "Artificial Intelligence and Deep Learning " from 3rd to 9th Feb 2021 at Model Institute of Engineering & Technology,Jammu
    2) 5 days online FDP on "Research in Engineering-A way Forward" conducted from 6th to 10th July 2020 at A.P.Shah Institute of Technology,Thane
    3) 3 days online workshop on "Education 4.0" organized by IQAC, Atharva College of Engineering held on 28th - 30th April 2020.
    4) 3 days online workshop on "Education 4.0-Season II" organized by IQAC, Atharva College of Engineering held on 28th - 30th May 2020.

2. Swayam/NPTEL/Coursera/Udemy or any other course completed:

    1) " Neural Networks and Deep Learning" by Coursera in May 2020
    2) "Improving Deep Neural Networks: Hyperparameter tuning, Regularization and Optimization "by Coursera in May 2020
    3) "Convolutional Neural Networks" by Coursera in July2020
    4) "Structuring Machine Learning Projects" by Coursera in July 2020
    5) "Programming for Everybody" by Coursera in July 2020

3. Specialization Courses/Global Certifications:

    1) "Fundamentals of Deep Learning" by NVIDIA DLI,June 2021
    2) "Building Transformer-based Natural Language Processing Applications" by NVIDIA DLI in June 2021
    3) "Fundamentals Of Deep Learning for Computer Vision" by NVIDIA DLI in December ,2019

4. Any other achievements:

    1) Reviewed papers of the 4th Biennial International Conference on Nascent Technologies in Engineering organized by Fr. C. Rodrigues Institute of Technology, Vashi, Navi Mumbai, (India) in its premises in association with IEEE & IAS on January 15-16, 2021.


Agnel Charities'
Fr. C. Rodrigues Institute of Technology
Vashi, Navi Mumbai (India)
IEEE Technically Co-Sponsored
4th Biennial International Conference on
Nascent Technologies in Engineering
ICNTE - 2021
Certificate of Appreciation
This is to certify that Prof. JAYA GUPTA
has reviewed papers of the 4th Biennial International Conference on Nascent Technologies in Engineering organised by Fr. C. Rodrigues Institute of Technology, Vashi, Navi Mumbai, (India) in its premises in association with IEEE & IAS on January 15-16, 2021.
(Dr. Mini Rajeev)
Conference Chair
(Dr.S.M.Khot)
Principal

Achievements
Technical

Prof. Krupi Saraf

1. STTP/FDP/Seminar/Workshop Attended:

    1) 2 days workshop on ML & AI using covid 19 virus data analysis (29 & 30 April 2020).
    2) 5 days FDP on “Research in engineering – a way forward” (6th to 10th Jul 2020).
    3) 1 week STTP on “Programming in JAVA”, TSEC (13th – 18th Jul 2020).
    4) 5 days workshop on “Robotic Processing Automation” conducted by Bennett University from 27 May to 31 May 2020.
    5) FDP on Drupal from spoken tutorial, IIT Bombay on 4th May 2020.
    6) FDP on Linux Training from spoken tutorial, IIT Bombay on 20th Apr 2020.

2. Swayam/NPTEL/Coursera/Udemy or any other course completed:

    1) Programming for Everybody(Getting started with Python)
    2) Capstone: Retrieving, Processing and Visualizing Data with Python
    3) Using Python to Access Web Data
    4) Python Data Structures
    5) RPA Developer foundation, UiPath

Prof. Shafaque Syyed

1. STTP/FDP/Seminar/Workshop Attended:

    1) Completed 4 weeks NITTT Module 5 - Technology Enabled Learning and Life Long Self Learning

Achievements
Technical

Prof. Bharti Khemani

1. STTP/FDP/Seminar/Workshop Attended:

    1) 5 days FDP on "Quantum Computing from AICTE Training and Learning (ATAL) Academy Online (2021-2-22 to 2021-2-26)
    2) A Review on Reddit News Headlines with NLTK tool presented in the 4th International Conference on Innovative Computing and Communication (ICICC 2021)on 21st Feb,2021.

2. Conference/Journal Paper Publication Details:

    1) Title: A Review on Reddit News Headlines with NLTK tool published:in the 4th International Conference on Innovative Computing and Communication (ICICC-2021),on 20th-21st February, 2021.

Mr.Sagar Desai

1. Swayam/NPTEL/Coursera/Udemy or any other course completed:

    1) Elastic Google Cloud Infrastructure: Scaling and Automation(Coursera)
    2) Python 101 for data science (Cognitive class.ai)
    3) Cyber Security Foundations from Palo Alto Networks Cyber Security Academy

2. Specialization Courses/Global Certifications:

    1) "Fundamentals of Deep Learning for Computer Vision" by NVIDIA DLI

STUDENTS ACHIEVEMENTS

The journey is as important as the outcome
At COMPs, the students are encouraged to grab every opportunity and unleash the potential within them by participating or organizing.
The students of our department has yet again proven their mettle by participating and winning prizes invarious technical events

Technical Achievements

CODEICON 2.0 Hackathon

Congratulations to our BE Computer Students, Jatin Saini and Anmol Majithia, who won the first runner up prize in the Hackathon competition held at K J Somaiya Institute of Management, powered by General Mills on 5th of February, 2021.


SOMAIYA VIDYAVIHAR UNIVERSITY
K J Somaiya Institute of Management

General Mills India Center

K J Somaiya Institute of Management
A Constituent Institute of Somaiya Vidyavihar University
Mumbai, India

ICON 2021

Certificate of Appreciation

presented to

Jatin Saini

for clinching first runner-up in CODEICON 2.0,
a hackathon event held on 5th February 2021
powered by General Mills.

Prof. (Dr.) Monica Khanna
Director
K J Somaiya Institute of Management

Prof. (Dr.) Davendranath Jha
ACP- Data Science and Technology
K J Somaiya Institute of Management

Prof.(Dr.) Bharati Wukkadada
Chairperson ICON
K J Somaiya Institute of Management

Certificate ID: 2021-0217-6422E92E | https://ddkjsim.somaiya.edu/verify
This is digitally generated certificate and does not require signatures.


SOMAIYA VIDYAVIHAR UNIVERSITY
K J Somaiya Institute of Management

General Mills India Center

K J Somaiya Institute of Management
A Constituent Institute of Somaiya Vidyavihar University
Mumbai, India

ICON 2021

Certificate of Appreciation

presented to

Anmol Majithia

for clinching first runner-up in CODEICON 2.0,
a hackathon event held on 5th February 2021
powered by General Mills.

Prof. (Dr.) Monica Khanna
Director
K J Somaiya Institute of Management

Prof. (Dr.) Davendranath Jha
ACP- Data Science and Technology
K J Somaiya Institute of Management

Prof.(Dr.) Bharati Wukkadada
Chairperson ICON
K J Somaiya Institute of Management

Certificate ID: 2021-0217-78DD83F0 | https://ddkjsim.somaiya.edu/verify
This is digitally generated certificate and does not require signatures.

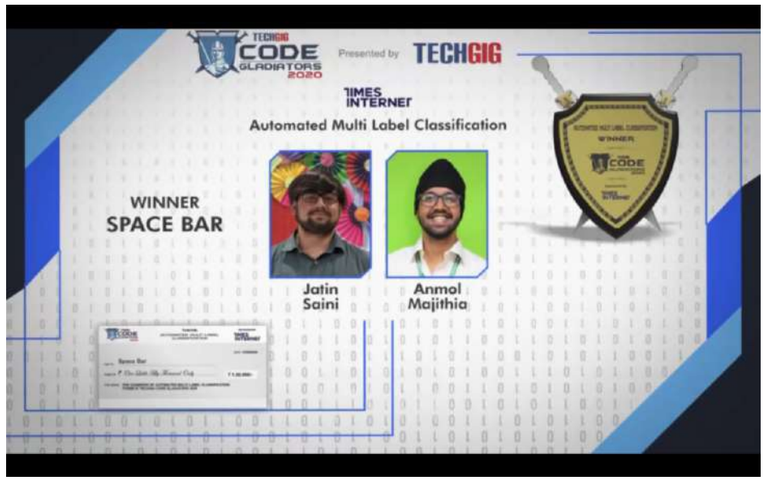
Achievements

Technical

Global Certifications

Sr. No.	Course Name	Number of Certification
1	Palo Alto	18
2	NVIDIA Deep Learning	70
3	Oracle Academy Database Foundations	36
4	Oracle Java	61
5	AWS	01
6	UI Path	04
7	Huawei ICT Academy	01
8	Coursera Certifications	700+

TECHGIG Code Gladiators



Jatin Saini and Anmol Majithia from BE Computers has secured first position in Times Internet Challenge organised by the Techgig Code Gladiators held on 13th of August 2020.

Student Publications

Shilpa Chandra of BE Computer 2020 presented a paper titled Crop Water Requirement Prediction in Automated Drip Irrigation System using ML and IoT in ICNTE 2021 organized by Fr C Rodrigues Institute of Technology, Vashi in association with IEEE and IAS on January 15-16 2021.

Anuja Velaskar, Apurva Waingankar and Nidhi Munavalli of BE Computer 2020 published a paper titled “Text Recognition using Convolution Neural Network for Visually Impaired People” in Congress on Intelligent Systems 2020,Intelligent Learning for Computer Vision,pp 487-500 Springer.

Codechef College Chapter

In September 2020, 4 of our students took the initiative to apply for starting a CodeChef Chapter in our college. After lengthy interviews they were finally selected to start the chapter with Aaditya Muley as the President, Anuj Mishra as the Event Lead, Yash Sampat as the CP lead & Rakshit Shah as the Promotional Head. The chapter had attracted 74 members by January 2021 from various branches. Many activites to improve the competitive coding skills of the members were conducted including teaching sessions, quizzes, coding contests, with CodeChef goodies given out as prizes to the winners.

Microsoft Student Ambassador

Anuj Mishra of TE Computer 2021 has been selected as the Microsoft Learn Student Ambassador to represent the college at the Microsoft community and promote learning of Cloud Computing with the help of Microsoft Azure.

Sports and Extra Curricular Achievements

Expanding mental horizons and building all-rounders.
Time and time again employers tell us that a degree alone is not indicative of a well-rounded graduate. We have invested resources to offer a comprehensive range of co-curricular and extra -curricular activities, be it sports, music, dance ,entrepreneurial schemes or volunteering. We encourage students to recognize the value of these activities as part of their development. Students are expected to develop a reflective portfolio to assist their development and showcase evidence of their skills and capabilities to future employers. To date, we are pleased with the increasing numbers of students engaging in these activities.

Sports Achievements

OJUS is the sports extravaganza that everyone prepares for, that everyone waits for, and that everyone aims for. OJUS is the platform for all the amateur sports people, and is also a battlefield for all the experienced veterans, having tons of experience and skill in their game. For the past years, OJUS has always been on the rise, witnessing stellar action and competition from Apsitians and win laurels for their college. To put it short, OJUS is the place to be, and the sporting avenue to explore!

- Het Patel from Second Year Computer Engineering Department won the runner up position in gaming event CS:GO.

Extra Curricular Achievements

- Moksha Shah of TE has won the first prize in the event of oving Fables at Ojus 2020.
- Moksha Shah of TE has achieved first prize in Face Painting event at Ojus 2020.
- Abhishek Mishra of TE stood runner up in the event of Standup Comedy at Ojus 2020.

INNOVATIONS

ARTICLES

Innovative young minds on fire
Writing a technical article that can be published in a magazine, conference or journal is a challenging undertaking. Witness our dreamers thinkers and doers trying to share their knowledge of a technology, project or software they are excited about.

Understanding Blockchain, Ledger systems, and some facts

Hritika Kucheriya(SE Computer)

Introduction:

A technological disruption doesn't occur unless people are heavily invested in it. People are well adapted to the existing technologies but still, have an old-school approach towards a solution. The problems underlying finance, data management, voting, and other areas are addressed using different platforms. Though such platforms do not necessarily provide a guaranteed solution. And the very centralized nature sometimes involves bad players leading to fraud or forgery. So what exactly am I talking about?

If you have heard about blockchain, it is going to be the next big thing after the internet. Blockchain simply stores the monetary transactions, just like paper logbooks in the form of credits and debts that are transparent. As the name depicts, all the individual transactions are bundled together in the form of blocks that are linked to each other immutably. Here, information is shared by the nodes just like the contents on the Torrent site, provided that they are legitimate or without copyright issues. So this technology will transform the transactions, the way the internet did for the information.

How does blockchain work?

Blockchain works on the mining algorithm. Let us consider an algorithm for Bitcoin's blockchain. The Bitcoin blockchain

runs SHA-256 (SECURE HASH ALGORITHM 256 BITS). It collects input which can be anything ranging from numbers, texts to computer files of any size. The output produced is so-called a hash having the same size, that is 256 bits in machine code each time.

The same input will always return the same output. But the most striking factor of SHA-256 is that even a minute change in the input will change the output completely. Another thing is that you have only output; you can't figure out what the input was. Moreover, you can only make a guess, and the odds of figuring that out is 1 in 2^2 , which is pretty much impossible. In simple words, it's super secure. You can try out some SHA-256 conversions.

We know the abilities of hashing and now we will discuss what's inside the process a little ahead. For now, let us have a look at a simple demonstration of P2P transactions via blockchain.

Say, Sam owes Mary 1 Bitcoin, and to do so, Sam broadcasts a message to all the miners in the network with the transaction he is going to make. During the process, Sam shares Mary's public address and the amount of digital money he would send with the miners along with the digital signature and lastly his public key.

Say, Sam owes Mary 1 Bitcoin, and to do so, Sam broadcasts a message to all the miners in the network with the transaction he is going to make. During the process, Sam shares Mary's public address and the amount of digital money he would send with the miners along with the digital signature and lastly his public key. The signature is created through Sam's private key. The miners then verify if Sam is the owner of that 1 Bitcoin and he's willing to send Mary. When miners make sure that the transaction in the process is legit, they proceed by including that in a block along with other transactions and finally attempt to mine the block. The miners then put the block through the mining algorithm, SHA 256.

To ensure validity, the output must begin with a certain number of 0s. The number of 0s required depends on "difficulty" which changes depending on the network's computing power. If miners want to produce the desired number of 0s at the output hash, they add a Nonce number into the block right before running it through SHA 256.

Due to this add-on feature, a small change to the input drastically changes the hash value at the output. The miners implement random nounces until they get valid output. But once they successfully mine the block, miners can then broadcast that block to other miners on the network. Now again, the block is checked to ensure its validity and later that block is added to the blockchain. Eventually, Mary receives that 1 Bitcoin, and the transaction is now complete. Moreover, miners are also required to include the output from the previous block such that the rest of the blocks are chained together, hence the term blockchain.

This is how trust works in the blockchain system. Each miner equips one copy of the blockchain on their system. Even though a miner tries to change transactions on the previous block, that block's hash value will change leading to the need to revise all the other blocks. Now to make anyone accept his block, the miner needs to redo all the work. To perform a forgery, that miner requires more than 50% of the network's computational power which is not feasible.

Key features of blockchain:

- Any transaction can be verified to be legitimate via a consensus mechanism, which means all the network participants must agree with the transaction.
- A single distributed ledger allows a person to determine his/her ownership of an asset or the execution of a transaction.
- The transaction data can't be reversed or forged. In case of an error in any transaction, a new transaction must be done to rectify the error. Both the information will be stored.
- Due to the provenance feature, participants can trace any assets right from the point of manufacturing to the ownership of that asset. Also used during the change of ownership.

In The Search for Origin of Entropy

Soumyojyoti Dutta(SE Computer)

The term 'Entropy' is familiar to all of us more or less from high school Physics. Loosely speaking, it is the measurement of randomness or disorder in a system. It's called an emergent property i.e., a property that derives from the interactions of the parts of a larger system. There are 3 main types of entropy. Thermodynamic entropy, Information Entropy (Shannon Entropy), and Entropy of Quantum Systems (Von Neumann Entropy). Now the question is what this entropy emerges from? What underlying property of nature do all these different definitions of entropy describe? Nowadays, we know that getting fundamental implies that we have to look for the answers in the quantum realm. Here I will discuss the different types of entropies and their quantum mechanical origin.

1. Thermodynamic Entropy: Roughly speaking it is the amount of unavailable work. According to Statistical mechanics, Entropy is the number of ways a system can be arranged and have the same energy i.e., it is all about probability. Consider two small solids comprised of 6 atomic bonds each.
In this model, the energy is stored in each solid is stored in the bonds. Now, the more energy a solid has, the hotter it is. It turns out that there are numerous ways that the energy can be distributed in the two solids and still have the same energy. Each of these distributions is called a microstate. Among these probable configurations, some have a higher probability of occurring than others due to their greater number of microstates. It implies that entropy is a measurement of energy spreading. Thus, concentrated energy means low entropy and high entropy implies high energy spread. That's why the entropy of a system becomes maximum when it reaches its equilibrium state.

2. Information Entropy: It may come to mind of many people that what does the entropy thing has to do with the information? Information is an abstract entity. But unfortunately, they are wrong. Information is physical and is tied to all the restrictions and possibilities of our real physical universe.

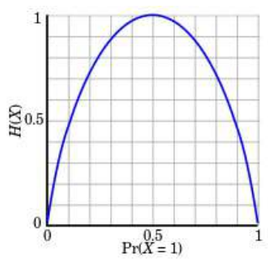
"What is a computer? That is a surprisingly complex question, but whatever precise definition one adopts, it is satisfied not just by the objects people commonly call "computers" but also by everything else in the world. Physical objects can solve a broad class of logic and mathematics problems, although they may not accept input or give output in a form that is meaningful to humans. Natural computers are inherently digital: they store data in discrete quantum states, such as the spin of elementary particles. Their instruction set is quantum physics." - Seth Lloyd and Y. Jack Ng (Scientific American,2007)

So, let's understand the information entropy through an example. Consider tossing a coin (may or may not be fair). We know it is a Bernoulli process. Now, if there is a random variable X that can take one of the values x with respect to probability p(x). The information content of x is defined as,
$I(x) = -\log_2(p(x))$

The entropy or the measurement of the uncertainty of the unknown result of the tossing of a coin is maximum if the coin is fair. So here we have two certain cases for biased coin and one uncertain case for unbiased.
According to Shannon's formula
of entropy

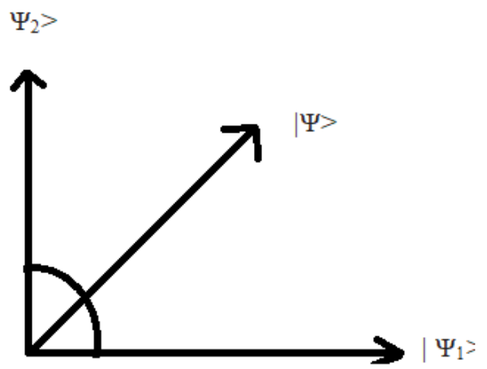
$H(x) = -\sum p(x_i) \log_2(p(x_i))$
For $p(x) = 0$ and 1
$H(x) = 0$
For $p(x) = ½$
$H(x) = 1$ (max.)

Information entropy is measured in bits.



The third type of entropy is called Von Neumann entropy. It is the entropy of quantum mechanical systems. Before moving on to the Von Neumann entropy, we will have a short review on quantum mechanics (Heisenberg's version of quantum mechanics/matrix mechanics and Dirac's Bra-ket notation will be used).

Here quantum states are represented by a complex column vector also known as ket. Conjugate states are represented by a complex conjugate row vector called Bra. Observable or measurable /operators are described by n*n matrix (n is the no. of quantum states). In this form, a wave function of a particle in an n-state quantum system can be written as,
$|\Psi> = \alpha1|\Psi1> + \alpha2|\Psi2> + \ldots. + \alpha n|\Psi n>$; where $|\Psi1>$, $|\Psi2>$, $|\Psi n>$ are quantum states (or orthogonal basis states in abstract mathematical sense, which belongs to



Hilbert space)
$|\Psi1> = 1\ 0$ and $|\Psi2> = 0\ 1$ (For a 2 state system)

and $\alpha1, \alpha2 \ldots\ldots, \alpha n$ are probability amplitude for respective states.

There are mainly two types of states. Pure states and mixed states.

The pure state of a quantum mechanical system is described by a ket vector which is an element of the Hilbert space. If the system is in a state $|\Psi>$ that is a superposition of all available basis states (until a measurement is made) i.e.
$|\Psi> = i=1n\ Ci|\Psi i>$ and $i=1n\ |Ci|2=1$

Upon measurement, $|\Psi>$ collapses to a single $|\Psi i>$ state with probability $|Ci|2$.

2 state quantum systems are known as qubits which is the main basis of quantum computing. A spinning coin can be considered as its analogy.

There is another type of state called the mixed state. Suppose you have a bag full of n number of balls among which n1 balls are black and n2 balls are white (n1+n2 = n). The probability of picking up a white ball randomly from the bag will be n2/n and for black balls it will be n1/n. Now consider the same case for a quantum mechanical system where you shall have quantum particles of different states instead of balls of different colors i.e., it is a statistical ensemble of pure states: $\{\{|\Psi1>, w1\}, \{|\Psi2>, w2\} \ldots\ldots, \{|\Psi n>, wn\}\}$ where wi is the classical probability corresponding to $|\Psi i>$ state. In contrast to the pure state, the mixed state can't be described as a single ket vector. Here a n*n matrix is used that is Hermitian and positive semidefinite and has trace 1.

Here we use a statistical operator or density matrix (density operator) to describe the mixed state.
$\rho = i=1k\ wi|\Psi i><\Psi i|$

The pure state can also be described by a density matrix, $\rho = |\Psi><\Psi|$

The Expected/average value of any observable L can be calculated by the formula,
$<L> = Tr(L\rho)$

Now, let's talk about Von Neumann's entropy. I am not going to discuss its all-mathematical details here as it's a little bit rigorous. In layman's language, it's a generalized version of Shannon entropy as it quantifies the amount of information present in a system and the number of correlations. Btw, it's also the heart of quantum information theory. For a quantum mechanical system described by a density matrix ρ, the Von Neumann entropy is,

$S = -Tr(\rho \ln \rho)$
Now, we know, $\rho = i=1k\ wi|\Psi i><\Psi i|$
Then the Von Neumann entropy is merely,
$S = -i=1n\ wi \ln wi$

This form is equivalent to Shannon's entropy. It can also be used to determine how many bits of classical information we can get out of the system when we make a measurement. It also tells us about the amount of entanglement of a system. Now, let's talk a little bit about entanglement as it is the key to understand the origin of entropy. It is one of the most interesting features of quantum mechanics. Einstein once called it "Spooky action at a distance". We know an electron has two spin states. "up" $(|\uparrow>)$ and "down" $(|\downarrow>)$. When we do not measure the spin of an electron, it is $\alpha1|\uparrow>+ \alpha2|\downarrow>$. After measurement, it becomes either up or down. Now consider a system of two electrons such that, if we measure one electron, the other will give its opposite spin after measurement. The wavefunction of such a system can be written as $|\Psi12> = \alpha1|\uparrow>1|\downarrow>2+ \alpha2|\downarrow>1|\uparrow>2$, where 1 and 2 are the label of two electrons.

Suppose we have measured the spin 1st electron and got its spin as up, then the spin of the 2nd electron will be automatically set to down, no matter how much Spatio-temporal distance (distance between two points in space time) is among them. But we can't use it faster than light communication (the cause is currently out of the scope of this article). So, here these two particles are behaving like a single particle. Though the particles individually are in a mixed state, the whole system behaves like a pure state. So, the Von Neumann entropy of this whole system is zero as **|Ψ12>** holds all the information about their current state. But if we consider a single particle, the part of the wave function corresponding to a single particle does not contain all the information about the whole state. So, the Von Neumann entropy is not zero as the information is hidden in the part of the wave function corresponding to the other particle. Bingo! We have found the root of the entropy! Entanglement is the point where the entropy starts. Didn't get it? Let's try it simply.

When a particle is created, it is in a pure state, where we have all the information available for that particle, so there is no entropy. When it interacts and entangles with other particles, it becomes a mixed state itself, where the journey of unavailable information/ entropy starts. When many particles are entangled i.e., the web of entanglement grows so faster that it becomes impossible to access the entire wave function which is known as decoherence. Here entanglement can be called the transition state between the microscopic and macroscopic world. As we move from the quantum realm to the classical realm, Von Neumann Entropy reduces to Shannon Entropy and thermodynamic entropy. So, this is how entropy emerges.

Role of Music in the Battle Against COVID-19

Rutuja Jain (SE Computer)

Music is a beautiful combination of rhythm (Laya) and sound (Naad). Music and psychology are closely related to each other. Human beings have always relied upon music to boost their morale and to express their emotions. In this COVID-19 pandemic, where people are under stress and anxiety, it has the power to relax them as it stimulates positive emotions and manages negative emotions.

COVID-19 warriors have definitely been encouraged by music. It builds a bridge between them and other people. People have been able to convey their faith, regards and all their emotions through it. A very strict lockdown was implemented in many countries around the globe. In literal terms people were locked in their own houses. No meeting other people, not being social, missing natural conversations and gathering - all of these were bothering their mental states. In such a stressful environment, music has always been a very good way to keep minds fresh. Amongst the different genres of music such as classical, semi classical, light etc. people can choose any in which they find interest.

In some countries, citizens played instruments and sung songs, standing in their balconies during the lockdown. By this gesture they lifted community spirits and reminded people to look after each other and not just themselves. "Music can heal the wound that medicine cannot touch," said Dr Debashish Mridha, an American physician, an author of Indian origin. A music teacher from Thane tried to boost the morale of COVID-19 patients through his performances. He took permission from TMC to perform live in COVID-19 hospitals.In India, on the day of Janta curfew, the entire nation paid gratitude towards corona warriors by 'Thali and Tali Naad'. This 'naad' created an energetic environment and encouraged warriors to fight against COVID-19. Music has the capacity to create an emotional response in the listeners. It is capable of leaving an everlasting impact on the mind of listeners. The work of creating awareness through music has been going on for years. In this pandemic, many artists have raised awareness through their own genres of music.

People have realized and understood the importance of strong immunity and one of the paths that leads to better immunity is 'Pranayam' in 'Yogashastra'. Pranayam regulates and controls breathing. Control over breath is also important in music or while singing. Similarly, 'sadhana' of 'nadbrahma' i.e., 'Omkar Chanting' is one of the best methods of Pranayam. Yoga and music together can help prevent and cure many diseases. This process is called 'Euphonic yoga'.

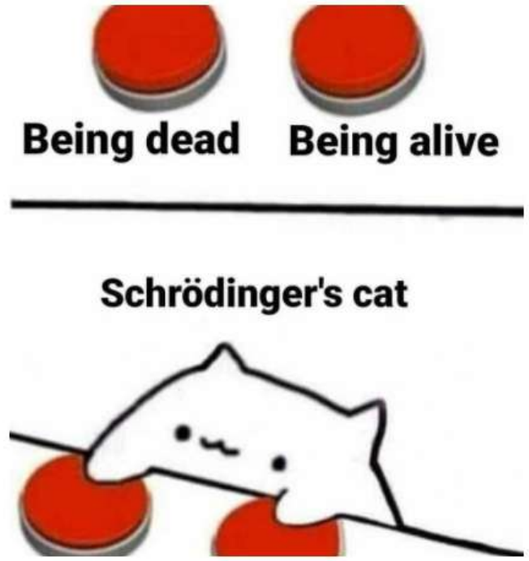
Music has definitely helped mankind in the battle against covid-19. It has helped to overcome anxiety, stress and also has helped many to boost their immunity.

A (qu)bit of Quantum Computing

Riddhi Narkar(SE Computer)

You probably must be reading this magazine on a device that beautifully leverages classical computing. No doubt, classical computing has been around for some time now, and since its inception, we've come a long way. It has helped us transform lives, change our outlook towards many traditional technologies, and gave birth to thousands of new technologies. After we've achieved this level of harmony with computing, is there a better alternative, maybe a new 2.0 version of this? How can the rise of a potentially new type of computing affect our lives?

A quantum researcher working on a quantum computer



Just what quantum computing is…

Our classical systems, your good old PC or your best buddy laptop use 'classical bits' or just 'bits' [the word 'bit' is a contraction of 'binary digit'] as the basic unit of information. The two valid 'states' or 'values' for a bit are 1 or 0. Everything your computer can do involves manipulating these bits in a really clever manner. And a computer does it in the best possible way, using efficient algorithms, and data structures. In layman's terms, we can call a computer a machine, which has just one core ability – distinguishing whether something is a 0 or a 1, and with this mere ability, it does wonders; that's just how we humans have designed this beautiful technology

Let's talk about quantum systems. The main, and the most important distinguishable fact in quantum computers is that its basic unit of information is a "quantum bit", or "qubit" for short. Now comes the fun part. The valid states of a qubit aren't discrete values. What I mean is that at any given instance of time, a qubit can acquire "any value between a 0 and a 1 including the boundaries". To put it in simpler terms, a qubit is a mixture of a 0 and a 1. It can be some percentage (or probability) of a 0 and some percentage of a 1, at the same time! In technical terms, we say that the qubit is in a superposition of 0 and 1. You might have heard this from the infamous Schrödinger's cat thought experiment. (Got a nice chance to insert a meme here).

Now that's spooky, but why is this that way?

Why this spookiness in thy qubits???

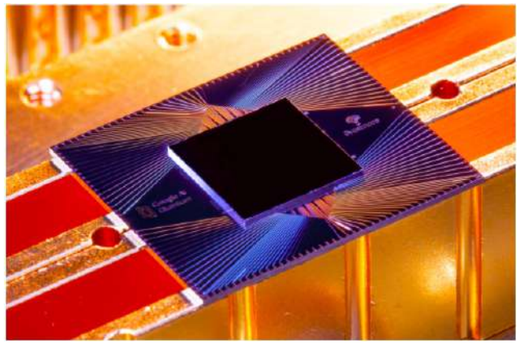
The answer lies in the core fundamentals of what a qubit, physically is. A bit is nothing but either of the 2 voltage or current states. High state for a 1 and low state for a 0. It is created by a basic electrical component called a "transistor". Think of these like tiny switches, which can allow electrons to flow, or restrict them. That is what a bit is in the real world.

Qubits, on the other side, are 2-level-systems. Their physical representation could be any quantum object like a single electron, a photon, or even an atom. Mostly, we use an electron. So, what features of an electron give us the mixed, or combined state of a qubit? It is its magnetic spin [kudos if you can recall your high school modern physics lessons], which can be in 2 states – up, or down.

Now you may ask, when fundamentally, an electron, too, laymen's has 2 discrete values for its magnetic spin, how can a qubit manage to hold both these states at once? An electron is fundamentally a quantum object, which means that it is so small that it no longer follows the laws of classical mechanics, but is governed by quantum laws or quantum mechanics. And quantum mechanics is notoriously known for being complicated and counter-intuitive, but don't worry, we don't need to know the entirety of this to understand how quantum computing works.

These quantum objects have a weird quality. As long as we don't try to measure them, or observe them, they are completely fine and maintain their superposition states, in our case, our electron has a magnetic spin of up and down at the same instance. But, as soon as we choose to make a measurement, or observe them, they "collapse" into one of their original states. This seems like quantum objects are like naughty kids, hiding their mischievous nature when kept under observation! These quantum states are so delicate, that an observer can ruin them just by looking at them! Yes, you read it correctly. Well, when you have to look at an object, photons bounce back from that object and are incident on your retina. This interaction of quantum objects with photons causes them to collapse into one of their superposition states. This exactly explains the Schrödinger's cat experiment we talked about earlier, and this experiment tells us how these quantum objects behave.

You'll say, all that's fine, but, how do we even manipulate these qubits when 'nondeterministic' is their middle name? Well, it seems out that we can actually control how much of a percentage of 0 and 1 will a qubit possess. So even when these qubits look really messy, what makes quantum computing work is our ability to utilize these qubits as we desire. How do we do this divine magic? We have quantum gates and quantum circuits just like what we have in the classical version of computing, and building and designing them does the magic.



Google's Sycamore quantum chip

Why work with these quantum snowflakes?

Now, when you know a bit about quantum objects, you might ask, why really take the pain to work with such delicate systems? Well…

Because we've achieved quantum supremacy in 2019, thanks to Google. Quantum supremacy is that stage in our research where we experimentally proved that quantum computers are in practice, much much faster than the most powerful classical systems we have in the current time. We did this by designing a computationally tedious mathematical problem, like factoring huge numbers for instance and feeding it into both the quantum computer and the most powerful supercomputer. And the time required by the quantum computer was significantly less than what the supercomputer took. But behold…you won't be having an iPhone Q or something rolling out anytime soon because quantum computers give us an advantage only and only for a certain subset of problems. And, they are bulky, really really bulky, as you need to keep your qubits insulated from sound, high temperature, and light because any of these interacting with the qubit means that you'll collapse the superposition of that qubit, and for a quantum computer, a collapse means loss of information. This also explains why quantum gates which are used to design quantum circuits are reversible in nature, unlike classical gates. Reversible gates ensure that no information is lost, a condition that is essential for quantum computing.

Quantum computing can have a revolutionary impact on our lives. Imagine if we had the power to really study how tiny quantum particles actually behave and interact. Well, that means we now would understand how atoms react with other atoms in more detail, and open new doors for advancements in pharmacy, so we will have better medicines and vaccines. (the current covid situation is enough to tell us how much of an impact can better medicines do). And this is just one sector where quantum computing could prove to be revolutionary! This has various high-scale impacts on dozens of other areas.

So when I say quantum systems, it does necessarily mean that we built quantum computers by changing the fundamentals of computing. And why did we do that? Moore's law. So Moore's told us that the number of transistors on a microchip doubles every 2 years. So this gives us a beautiful scale as to how fast we are innovating. But also, this sets a limit to our innovation. You see, transistors are now approaching the size of an atom! (here I mean that we can use a single atom as a transistor). And, I don't have to tell you that we just can't break this threshold. We cannot try to mess up with an atom by breaking it down further (unless you want some big blasts to blow away everything that ever existed ;)). So quantum computing, in a sense, helps us keep up with this trend.

When did humanity first swipe right for quantum computers ;)?

Okay, so this one's a bit complicated, but we'll skip some details. Richard Feynman was the first to ever think of building such a system. So, this came quite naturally to him, as he was thinking of building some sort of machine, which could study atomic-level particles well, so, a quantum computer to study quantum things was the straightest result that he could have arrived on. Over the years, many advancements took place, big or small; now we have quantum computers that can compute and can give you exponential speedups for a certain types of tasks. You can learn to design circuits and run them online on a real quantum computer.

Now, don't fret about the fact that taking a 4-year computer engineering graduate course wasn't the best decision of my life… Quantum computers will NEVER wipe out the legacy of our classical systems. There are still many things that our classical systems can do better than quantum computers because quantum computers give us an advantage on only certain types of calculations. Also currently, we know no way how we would fit a massive setup of this quantum beauty into the tiny space of our everyday portable devices. So, sit back, have a lovely cup of coffee, and keep thinking about all things quantum!

Let's talk about quantum systems. The main, and the most important distinguishable fact in quantum computers is that its basic unit of information is a "quantum bit", or "qubit" for short. Now comes the fun part. The valid states of a qubit aren't discrete values. What I mean is that at any given instance of time, a qubit can acquire "any value between a 0 and a 1 including the boundaries". To put it in simpler terms, a qubit is a mixture of a 0 and a 1. It can be some percentage (or probability) of a 0 and some percentage of a 1, at the same time! In technical terms, we say that the qubit is in a superposition of 0 and 1. You might have heard this from the infamous Schrödinger's cat thought experiment. (Got a nice chance to insert a meme here).

Innovations

Articles

Unravel: The Age of Decentralization

Ishan Sathe (TE Computer)

During the Cold War, there were two superpowers: The United States and the Soviet Union. Today, the electronic herd, which is the thousands of fund managers who control great sums of money, has the power to affect world politics more than politicians do. If the electronic herd does not like the way a country is managing their financial affairs, they will move their money elsewhere at the speed of light. It is not the politicians who have the power today, as they did in the Industrial Age. In the Information Age, it is the power of global digital money that often dictates a country's affairs.

There's a story of Bill Gates where he was trying to cross borders from the US to Canada, the customs agent asked him if he had anything of value on him. He pulled out a stack of floppy disks. "This is worth atleast $50 billion", he said. The customs agent, thinking he was talking to nut ended up letting the richest man in the world pass through the border without paying anything in taxes. The thing is.. the bundle of floppy disks was actually worth at least $50 billion. It was the prototype of Microsoft's Windows 95!

Super-rich individuals like Gates often have more money and influence over the world than large nations. Such power caused the US Government to take Gates to court for monopolistic practices. The frightening thing is that Gates can afford to hire better attorneys than the US Government can!

That is because the US Government is an Industrial Age institution and Gates is an Information Age individual

George Soros (a billionaire investor), believes that there are many corporations that have much more money and power than the Western nations. That means there are corporations today that could damage the economy of an entire nation just to benefit a few individuals. That is how much power some corporations have.

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Now, you may think.. looking at the markets that…

The bond market (10 times greater than the stock market) value has increased. This is bad for crypto and stocks because people would rather invest in something that is safer.

The dollar has just inched in strength, which is bad for BTC because, Gold and BTC are just like hedge and why invest in them when fiat currency is of greater value?

So, the signs look detrimental (or bearish for the market geeks!) for Crypto, But! News has come in from the Information Age, about the ushering of the Decentralized age. Following are some of the big points:-

-Even with stocks being dumped, the week had 30 billion stock sale over the weekend. We had banks warning of large significant losses as they had huge positions in many of the stocks that were dumped

-China proposed Central Bank, digital currency rules. Meaning China may come out with a crypto currency. They are kind of setting the precedent of how a cryptocurrency may behave globally. This is very big news! I believe this will reduce the strength of dollar. Why? Because China, one of the world's largest economies, will suddenly become less dependent on the world's currency, the dollar. This will weaken the dollar and thus strengthen crypto

-Fidelity announced that they want to launch a Bitcoin ETF (Exchange Traded Fund). Basically, all the big financial players want to get in on the bitcoin game by making it accessible to the public. Fidelity is not stopping at ETFs. They are also bringing Bitcoin collateralized loans so people can come in and deposit Bitcoin and get loans.

-Tesla is adding to the Bitcoin support! You can pay for your tesla with Bitcoin and they would actually keep the bitcoin as itself. Most retailers would exchange them immediately. But Tesla says they just don't care.

Finally,

-Paypal came in. Now when you go online to pay with PayPal you can choose crypto from your account. This is important because PayPal is set up with millions and millions of retailers. Simply put, now almost all retailers accept crypto as a payment.

Crypto currencies are no longer something to be held onto as an asset. It is now an actual currency. It is now able to be used by anyone!

All this news caused the Bearish crypto Week turn into a Bullish crypto week! It looks like crypto currency is here to stay.

Do you see the end of the dollar? The rise of the Decentralized currency? As we leave the information age, countries will try to hold on. Notice how China is trying to make their own crypto currency. But they are using old thoughts. When a country creates a crypto currency, it is not decentralized. It is merely trying to put on the mask

Whenever Ages change, chaos and confusion ensues. Decades ago, people could not comprehend the internet. Those that could, were leaps and bounds ahead of the Industrial Age investors and captialists. I feel that the same will happen in the Decentralized Age.

Better get educated so that you can be leaps and bounds ahead of the world. Better get educated now.

Why is sports analytics the past, the present and the future?

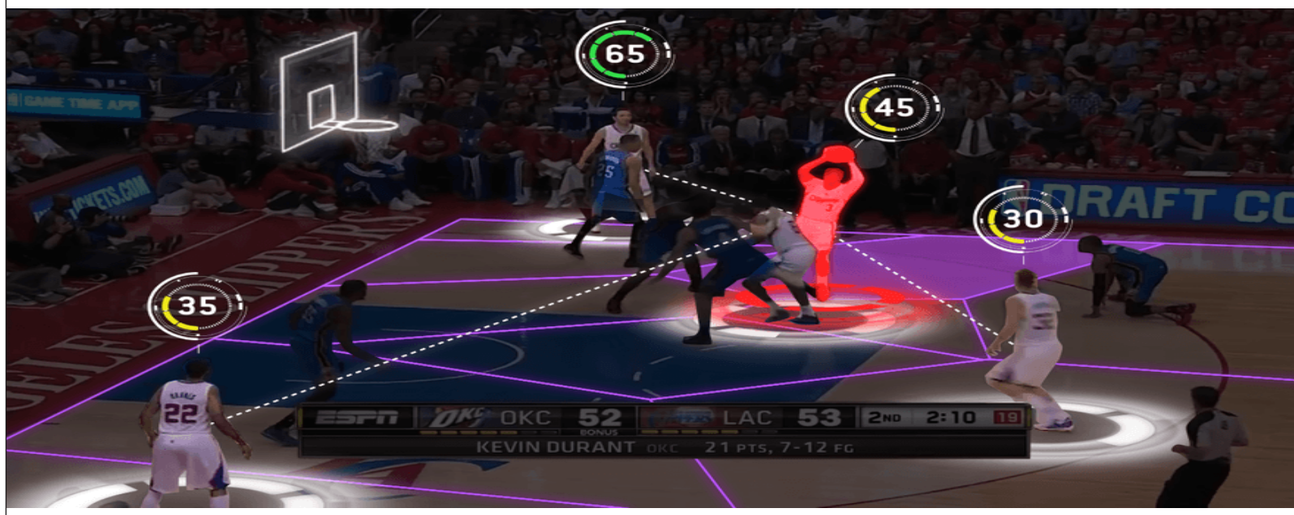
Zenil Gosher (TE Computer)

The sports analytics industry has made remarkable strides in the past decade and a clear sectoral megatrend. Athletes always want to improve themselves because sport only rewards performance. Age is not just a number in sport. Ofcourse, there are outliers like Roger Federer, Cristiano Ronaldo, Viswanathan Anand who still operate at a very high level but no one can beat time. You can roll back the years every now and then and claim the battle but the war will be won by time, like always.

Sports analytics was pioneered by the NBA (National Basketball Association) and subsequently adopted by MLB (Major League Baseball) with their moneyball tactics. Data analytics has seeped into NBA's culture so much that every NBA team has a data analytics unit. Data analytics provides the teams with an edge and in a game of fine margins it can make all the difference. Looking closer at home, Mumbai Indians are the most successful IPL franchise and they have a dedicated data analytics unit which gives insights about individual players using wearables and trackers as well as statistics and game plans. Leicester City had 5000-1 odds of winning the Premier League in 2016 and they had a strong data analytics team which helped in scouting, game preparation.

Being an athlete is expensive, coaches, diet, training equipment cause a heavy dent in the wallet. Athletes need sponsors in most cases. Young players in particular, do not have the resources to have elite coaches and by the time they reach the top level, it is already too late. In a developing country like India, where people in sport struggle for resources, democratization of data can help players approach their prime with all the insights that they need rather than reaching their prime without realising their full potential. Sport analytics makes the athletes better, the sport better and can help players reach the pinnacle in terms of what they can achieve. As they say, 'Nothing can compete with the drama of live sport.'

In the past, people used to keep a database of significant events like wickets, runs in case of cricket or goals, saves in terms of football. Tangible events were recorded. In the present , the focus is on intangibles, because everyone knows the significant events, figuring out the intangibles will give you the edge. The weather conditions, the pitch, match-ups, in terms of football attacking the opposition player's weaker foot. Or in case of tennis, putting a certain kind of spin the opponent is uncomfortable against rather than just targeting their forehand or backhand. These intangibles are the edge of good data analysis. Analytics drives better performance, it's proven.



Data analytics essentially gives the teams or the players a plan, to counter their opponents weaknesses or mask their own. Athletes can't change the way they play overnight because so much of being good at a sport involves muscle memory and repetitions. With the help of analytics, athletes can make those micro adjustments without having to change their entire technique. They can gain insights on their movement and improve upon them. Before, you would need coaches to identify patterns but with multiple camera angles and high definition video, machine learning algorithms are able to generate heat maps, predict the

shots the players are going to play by identifying their trigger movements just by parsing through old footage.The richness of data has truly fuelled innovation.

And it's not like data analytics has been a recent thing, it's been there for ages. Chess engines started beating top Grandmasters way back in 1997! Kasparov lost the iconic match against IBM's Deep Blue. Now even the engines on our mobile phones can beat any human. But the innovation didn't stop. Chess engines plateaued for a few years because to put it simply, engines analysed the moves human players played and ran all the variations till the end and found out which move led to the win. Then came artificial intelligence and deep learning techniques. The emergence of neural networks led to a plethora of new ideas in chess. What was different this time around? The neural networks weren't fed moves that humans played like the previous engines. Basically, the neural networks learnt the rules of chess and then they ran countless simulations. They didn't know what move was better, they simply figured it out themselves by playing against themselves. Chess is 1500 years old and in its current format is over 200 years old and countless games are played online and over the board and yet the engines found original ideas. This is the beauty of chess. But what is more beautiful is the fact that with a clean canvas, and no pre-configured moves, the neural networks engines were able to outperform current engines by just playing against themselves.

And this is the future. Humans come in different shapes and sizes and the ideal technique can't be modelled upon existing specimens, it's a good starting point but to get to the finish line, we have to let the neural networks compete against each other because we simply do not comprehend the scale of the horizon.

The ability to unlearn what we know limits us and once we accept that we do not know, the opportunities are limitless.

Dreaming Reality

Hardika.R.Lalwani (TE Computer)

Is there anything in life

That can we do, is unique?
Yes there are many things
I know that very well
But I struggle to find
The answers to my questions.
My dreams that
I want to put it in reality
I know everything
that I have to do
that will change my life,
that will change my world.
And I want to prove to myself
that the thoughts that I see in my dreams,
Will turn into my reality.

ABOUT THE DEPARTMENT

Department of Computer Engineering is the largest and most research strong department of its kind in Mumbai University. The Department was established in 2014 and currently offers a B.E in Computer Engineering. The department boasts a vibrant student body and a stellar faculty team of qualified and experienced professors. The Department has developed many state-of-art, fully air-conditioned laboratories with more than 200 desktop computers in various fields of Computer Engineering such as High Performance Computing, Web Technologies, Cloud Computing, Software Engineering etc. thereby providing ample facilities for project development and research. The department has tie up with CSI and maintains close relationship with industries of repute. The department takes immense interest in conducting professional activities such as organizing workshops, seminars and expert lectures to meet the challenges in the IT industry. Our results are constantly on the upward trajectory and the phenomenal growth of the department is attributed to the winning combination of dedicated and experienced faculty, brilliant students and strong administrative support from the institute.

This is only a small step towards a long journey.

To achieve progress and to meet objectives we have to cross numerous milestones. This issue of newsletter should inspire all of us for a new beginning enlighten with hope, confidence and faith in each other, in the road ahead..... As quoted

"If you want to go fast, walk alone, If you want to go far, walk together".

Prof. Sachin Malave

Parshvanath Charitable Trust's
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