

# IDENTITY 2022

# ABOUT UPES-CSI

"If your actions create a legacy that inspires others to dream more, learn more, do more, and become more, then you are an excellent leader."

Established in 2010, UPES-CSI started out as a student chapter with the sole purpose of learning through creativity. It soon became one of the most active chapters in UPES and still is as reflected by the sheer number of events it has conducted, a number set to increase manifold with each passing year.

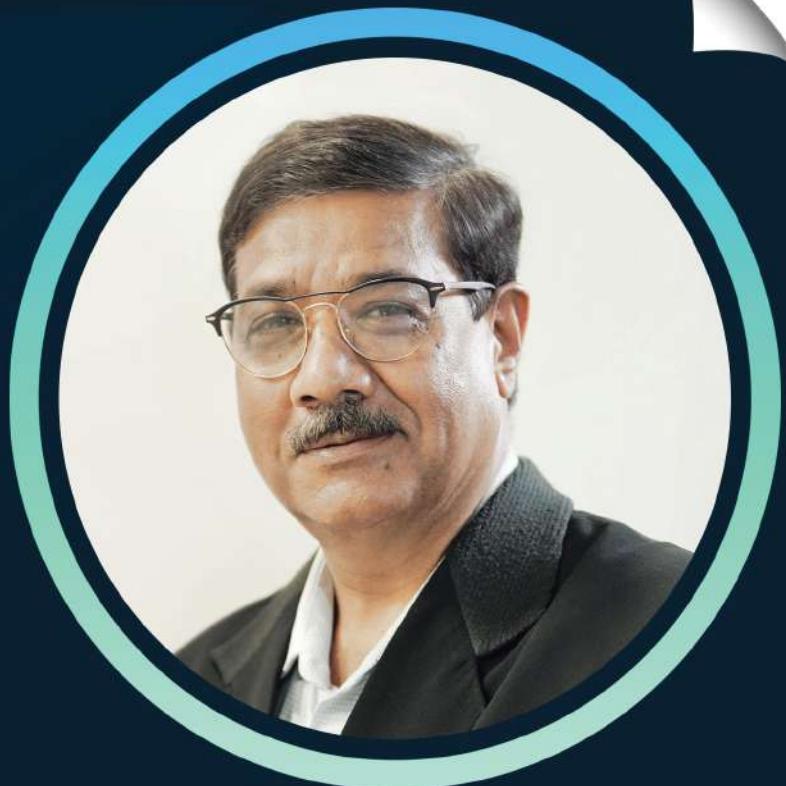
Like its sister chapters, the UPES branch of Computer Society of India is a youth organization which aims to provide an environment to "CREATE, SHARE and INNOVATE" in the field of Computer Science and its various technologies.

To achieve this we organise various events such as workshops, conferences and seminars on various topics both current and old, for the competitive edge we organise many coding events and Hackathons. Limited to not only technical, we also organise conventions and artistry competitions such as photography and poetry.

Awarded best CSI for the last seven years, UPES-CSI is a class apart and what makes it so is "you", the people it is comprised of. A group of dedicated and passionate individuals with dreams in their eyes and the determination to change the world in their heart.

**WE ARE UPES-CSI...**





## Dr. Sunil Rai

Vice-Chancellor  
UPES

Consistency is a word synonymous with UPES-CSI, who work diligently through out the year, coming up with unique ways of combining fun and learning into its many events well known over the campus and always anticipated by the students. What made UPES-CSI a class apart was the dedication to duty even during the Covid period. I congratulate them on the successful completion of another yet astounding tenure and wish them all the luck for the future. With these words, I present their annual magazine "Identity" for the 2022 tenure.



# Dr. Thipendra P Singh

Cluster Head Informatics  
School of Computer Science, UPES

It's finally time for all of your efforts to yield results.

After pouring their hearts and souls, UPES-CSI is releasing its annual magazine "Identity". Like always, UPES- CSI keeps the calendar packed the whole year with a variety of events that are well-attended not only by our students but also from all over the nation. This year was no exception. UPES-CSI is always one step ahead of the competition when it comes to providing students with practical knowledge, learning and fun at the same time. I am delighted to present its incredibly well-made annual magazine "Identity 2022".

Every year, UPES-CSI hosts their Annual Convention YUGMUK, which has been our most successful and anticipated event ever since its prenomination. With this year's theme as "Jack of all Trades", the chapter really proved itself by showing the same spirit in its organisation and management. Seeing the students work together as a team to make the event a success made me very proud. And like always, YUGMAK was a great success with incredible participation.

Additionally, the student chapter has been crucial in helping the students in maintain a balance between academics and event organisation. It was an excellent platform for students to demonstrate their abilities and skills as well as hone themselves to perfection. It also provided students with experience and training in working under pressure, meeting deadlines, and persevering in unfamiliar situations. It is made up of a highly dedicated team that leaves no stone unturned when it comes to organising and making an event a huge success. However, as we say, "words like improvement, achievement, and success have no meaning unless there is continuous growth and progress." I hope that, as it does every year, UPES-CSI continues to grow, flourish, and emerge victorious across all of its endeavours. I wish them success in all of their future endeavours.



## Dr. Vinay Avasthi

Founder Branch Coordinator  
UPES-CSI

"Success is not final, failure is not fatal: It is the courage to continue that counts"

I admire the impeccable amount of effort that the committee has put into the latest edition of Identity. It is quite astonishing that the committee has consistently kept this magazine alive each year with new and innovative articles. The level of contribution and collaboration that the team has established is quite impressive. I congratulate UPES-CS| Student Chapter for being such a successful and accomplishing Student Chapter. Also, I appreciate the dedication and devotion of the committee members of this society who helped it reach this stage. With the zeal of organizing all the events like Hackathon, Yugmak, workshops, and finally launching this magazine consistently. In addition, I once again congratulate UPES-CSI for their remarkable performance in organizing Devbhoomi Hackathon, a collaboration with Uttarakhand Police. The student chapter has witnessed success every year and sets a benchmark every year for the CSI itself. I'm proud to be a part of CSI and hope that their hard work and dedication pay off in all of their future ventures and endeavors. I heartily congratulate UPES-CSI Editorial Committee and Design Committee for publishing their annual magazine which consist the beautiful and convivial journey of UPES-CSI Student Chapter long with the wonderful and knowledgeable content present inside. Also I appreciate the dedication and devotion of the students who helped society to reach at this stage. I hope that UPES-CSI keeps up the amazing work and continue to achieve greater heights. My best wishes are with the UPES-CSI family. Best of Luck.



## Ms. Shubhi Sharma

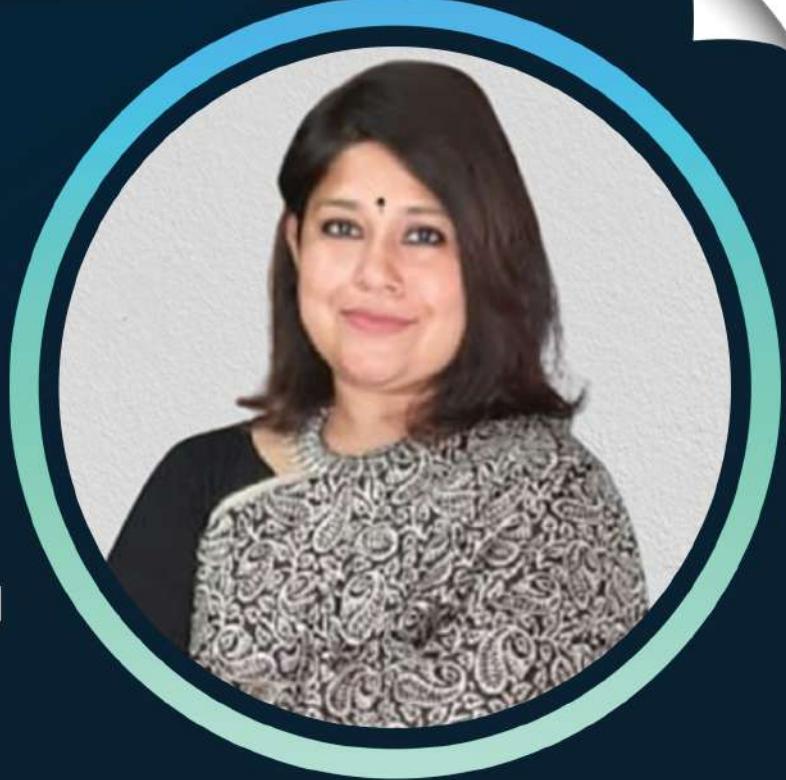
Student Branch Coordinator

UPES-CSI

Overall stimulation for greater growth of mind has been one of the foremost ideals of UPES-CSI. "Create, Share, Innovate" is limited to not only academics but also co-curriculars, something we pride ourselves in. Be it hackathons or youth fests, UPES-CSI delivers nothing short of perfection. We as an organization composed of students and faculties alike excel in all the fields we set our foot in. We not only excel, we set new benchmarks paving the way for future innovation. Every year the CSI family touches new heights of excellence with their strong sense of commitment, service, and responsibility. I appreciate the dedication and devotion of all the team members. Being a part of this talented and incredible family is truly an honour.

The annual magazine "Identity" is a platform for students to reflect back and creatively compile the treasured memories and highlights of the past tenure. Workshops, events, Hackathons and Yugmak, the amalgamation of all flavours of life has provided an experience vast to be put under a singular node. Hence, this year, Identity has no theme, giving students the creative liberty to be candid and personal.

I congratulate all the heads, the core committee members and all the amazing people who comprise our UPES-CSI family and thank them for a yet another amazing year. Congratulations to the entire team for their valuable contribution to unveiling the magazine, best wishes and best of luck for their future endeavours.



## Ms. Sugandha Sharma

Faculty Coordinator

UPES-CSI

"If you continue to think the way you've always thought, you'll always get what you've always got"  
Consistency, camaraderie and congeniality.

The underlying qualities that make up the UPES-CSI family.

With hard work and togetherness, the team of UPES-CSI has always strived for the best and undoubtedly worked very diligently for setting up benchmarks. I feel immensely proud of UPES-CSI for continuing its tradition of setting milestones. I hope that the team will continue to grow in the upcoming years.

With this, I proudly present this year's edition of our annual magazine "Identity" which encompasses the tenure in a crisp and beautiful manner for all to enjoy and indulge in. This past year was a flux of experiences which could not have been restricted under a singular theme. Hence, we have let the editorial team to flow free in the ocean of creative freedom and have foregone the theme.

I wholeheartedly congratulate the entire team of the Editorial and Design committees for publishing their annual magazine consisting of the climax of the journey of the UPES-CSI student chapter with thought-provoking articles and technical updates.

I hope that UPES-CSI keeps up the incredible work and continue to achieve greater heights. My best wishes are to the UPES-CSI family.



## Mr. Rahul Kumar Singh

Faculty Coordinator

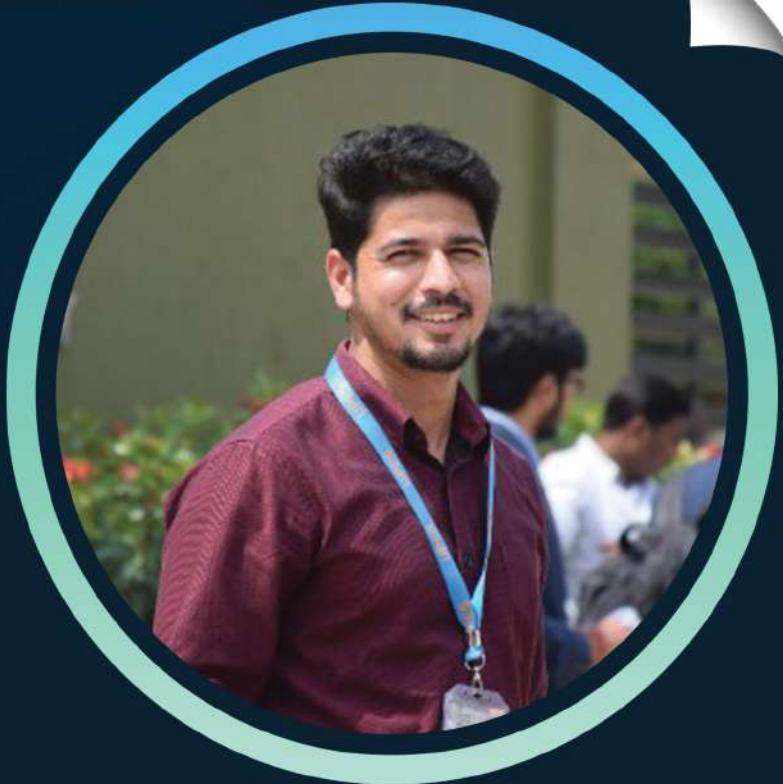
UPES-CSI

The science of today is the technology of tomorrow.

It brings me great pleasure to offer the tenth edition of the UPES-yearly CSI's magazine "IDENTITY." This magazine is the outcome of students' devotion, persistence, and collaboration, as well as their creativity and passion for technology. It's impressive that there is no theme for the magazine this year, as it allows students to explore new topics without being bound under a single thread. Instead, it has helped in bringing about the similarity in the dissimilarity and helped in weaving a bond of oneness among all of UPES-CSI. Since things are so uncertain nowadays, it's vital to enlighten people on where technology has brought us and how it evolves every year.

UPES-CSI has been highly active in organising seminars, panel discussions with industry professionals, and various technological and fun events. These initiatives help students with their overall professional growth and train them for the workforce. It is a stalwart in shaping the young futures of India who will one day go on to be the pillars of growth and innovation for the whole world.

I would like to thank everyone on the team for their efforts in making this magazine a useful resource for all. I wish UPES-CSI the best of luck.



## Mr. Prashant Rawat

Faculty Coordinator

UPES-CSI

Just like what we all went through in 2021, some saw chaos while others saw opportunity in the midst of it. When the world was in a state of panic, some great innovators, technologists, artists, and inventors took advantage of the situation by devoting their minds to solving the problems that everyone was facing.

I'm proud of the UPES-CSI team for their hard work and dedication to not only this magazine, but also to organising events like Hackathon 6.0, interesting workshops, and, most importantly, Yugmak. After such a long time, CSI was able to hold its annual national convention on a massive scale.

I congratulate UPES-CSI on yet another successful completion and publication of their eloquent magazine. The work of both the Editorial Committee and Design Committee on this magazine is outstanding. This chapter motivates us to keep our minds open to new ideas and to keep innovating, even when we face physical limitations. I wish everyone the best of luck on their journey ahead and hope that all of their dreams come true. Since joining UPES-CSI, I have been astounded by the amount of work that the students put in to make each event a huge success. The committees have always done an outstanding job and demonstrated their worth. I congratulate each and every member for doing such a wonderful task and helping UPES-CSI become the best student chapter. I wish UPES-CSI all the very best for future endeavours!

**Pratik Geoffrey Saxena  
President  
UPES-CSI**



The journey with the CSI family has been splendid. It has been an honor to be the president of this remarkable team. Each event has been a new experience to learn from our respected faculties, team members, and participants. I shall forever cherish the memories that I have treasured over the years. Although it has been four years, it seems like a lifetime of emotions and memories.

This year, the team proposed to let go of the idea of a magazine theme and provide each member the liberty to share their thoughts on any topic they wish to. I hope you will enjoy reading this marvelous work by our team that has put in a lot of effort to present you with "Identity-2022". I will always be grateful to UPES-CSI for giving me a chance to learn, grow and lead as an individual. Best wishes to UPES-CSI for many more successful years.



**Ramya Mihir  
Vice-President  
UPES-CSI**

With profound love and reverence, I would like to thank the entire family of UPES-CSI for molding me into what I'm today. From being a member of a committee to the vice president of the chapter, the journey was so beautiful that every special moment captured by my heart stays with me forever.

I will surely miss this place for which I'm eternally grateful to CSI for giving me a chance to build myself as a better person.

Now, we are here with our yearly magazine 'IDENTITY 2022', full of insights and the journey of UPES-CSI. Taking this into account, I Ramya Mihir, on behalf of our entire team present you this wonderful magazine in the hope that you would enjoy reading it as much we enjoyed compiling it.

**Happy Reading!**

**Nitish Suri  
General Secretary  
UPES-CSI**



"These four years have been a journey, from member of the events committee to General Secretary of the best student chapter. UPES-CSI has always provided me with a wealth of memories to cherish. It is more than just a student chapter; it is a platform where every individual has the freedom to work.

UPES-CSI has continued to be the best student chapter in the university, and seeing the team carry out all of the events with zeal and enthusiasm fills me with pride.

We have successfully launched the all-new edition of our annual magazine Identity thanks to the combined efforts and hard work of the Editorial and Design teams.

This year's magazine will give you all an insight into a lot of previously unrevealed exhilarating things.

**Enjoy your reading!**



**Bhavini Mishra  
Secretary  
UPES-CSI**

UPES-CSI Student Chapter is a platform that not only allows students to showcase their talents, but also tries to teach and support them. Being CSI's secretary has always been a great honour. During my tenure, the position taught me how to manage my personal and professional lives in an efficient manner.

A journey of how I started from scratch and learned everything from the ground up! It was only in my imagination of where I saw myself that I ever considered participating in any of the college activities, but everything changed when my friends asked me to join CSI. My college life would have been much simpler if it hadn't been for CSI, with no memories to relive while sitting.

I'd like to praise the Editorial and Design committees on the publication of our annual magazine, which contains some very interesting articles and technological trivia. Finally, I want to wish the UPES-CSI student chapter many more successful years.

**Sarthak Saraiya  
Treasurer  
UPES-CSI**



UPES-CSI is a family to me, where learning and growing have always walked an extra mile, where every challenge was a new opportunity to evolve. Over the years, there has been so much to learn, experience, and treasure. Each member of this talented team has so much to be inspired.

I will always be grateful for the opportunities and the exposure that I found here. The faculties and seniors have always been a guiding light. Thanks to all my colleagues and committee members for sharing the road with me on this beautiful journey.

I hope you enjoy reading the magazine. Our editorial and design team has put in a lot of effort to deliver this alluring compilation of our memories.

**Happy reading!**



**Indrakshee Roy Choudhury  
Advisor  
UPES-CSI**

UPES-CSI has been a wonderful part of my college experience. This chapter has taught me a lot, from being a member of the events committee to being the associate events head and then the Advisor in the fourth year. It has instilled in me some of the most important life lessons, which I believe will aid me in crossing bridges when times are tough. CSI has given me some of the most beautiful friendships that I will treasure for the rest of my life. I am grateful for the opportunity to work with some of the brightest minds, whether it was the faculty who have always had our backs no matter what or my colleagues who have held my hand throughout.

"Identity" has played a significant role in this journey. This magazine includes not only technical or non-technical articles, but also the UPES-CSI family's hard work and dedication. Every year, we put our hearts and souls into it. We believe that we met the standards set by our seniors this year as well. For this year, we have let go of the restriction of a theme taking into account the myriad emotions and variety of experiences we all shared this tenure. Hence, the editorial team has had full creative freedom.

I hope you all share the same feelings as we did and enjoy Identity as much as we have.

**Milisha Gupta  
Advisor  
UPES-CSI**



UPES-CSI is the most extraordinary family that I'm privileged to be a part of, in my entire journey. It has imbibed me with some of the most valuable life lessons that I believe will help me cross the bridges when times are dark. The beautiful experience with the faculty and the team member is something that I can never forget.

My entire journey has not only been so enriching but rather also fun-filled. I will surely miss the days I have spent here and use what I have learned in my future endeavors.

I feel proud to present our annual magazine 'IDENTITY 2022'. This magazine doesn't just involve technical or non-technical articles, but it involves the hard work and dedication of editorial and design team. We design it every year with utmost love. I believe that we did justice to the benchmark set by our seniors.

I, on behalf of the UPES-CSI student chapter welcome you all to take a beautiful ride of our magazine.

Happy Reading!



## **Sparsh Thapa Design & VFX Head UPES-CSI**

"If your actions inspire others to dream more, learn more, do more and become more; then, you are a leader"

Simple, naïve and insignificant; as a young fresher at UPES I did not take much heed to these words of my previous heads. But the day I was called upon to take the lead of the Design Committee, I realized their meaning and also the magnitude of the shoes I had to fill.

But to realize big dreams, you need people with 'big' caliber and I am proud to say that I have found those people right here in UPES-CSI in the form of our Design and VFX team. Through thick and thin and over all obstacles, we have emerged successful and it was all due to the sheer hard work and will of the talented and extraordinary individuals I find myself having the pleasure of leading. It was an amazing year, one in which we learnt, we grew and we shared. From celebrations to hackathons to conducting YUGMAK 2022, we pushed ourselves to the limit, bringing to life the stuff of dreams; each poster outdoing the last, each video more astounding than the previous. I feel inspired and proud for having such a team and getting to learn so many new perspectives from my fellow team members. I am thankful to UPES-CSI for being the umbrella under which we all bonded, connected and grew both as members of a committee and as individuals; turning us from members of a committee to members of a family.

With this, I and the Design and VFX Team, proudly present IDENTITY 2022 in all its glory and beauty. We hope that our readers find something inspiring, something beautiful and something to light up their day with. We wish all our readers the best in their future endeavors as we bid adieu to the tenure.

Cheers and peace !



## **Prakhar Thapliyal Editor-in-Chief UPES-CSI**

"A leader is best when people barely know that he exists and when the work is done, they say they did it themselves"

With these teachings from my previous heads, I took upon the title of Editor-in-Chief. Anxious and with the weight of large expectations and a huge responsibility, I doubted whether I was enough. But with the help of my exceptional team of extraordinary writers and the support of my fellow heads, we persevered; setting new benchmarks, breaking previous records and taking the name of UPES-CSI to even greater heights.

As another tenure successfully comes to its conclusion, I am overcome with gratitude, satisfaction and pride. We have done amazing work throughout and I could not have asked for a better team than this. I am immensely thankful to have had such an amazing group of juniors who felt more like a family to me. I feel satisfaction in knowing that the mantle of UPES-CSI will be passed onto very capable hands which will take us soaring to unthinkable heights. I am proud to be a part of this talented organization which keeps true to its motto; Create, Share and Innovate.

With these words, the Editorial committee presents to you, IDENTITY 2022, a culmination of the hard work, energy and soul of UPES-CSI. We hope you find something inspiring, thought provoking and interesting.

We wish you all the best on your journey to greatness.

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## BGMI

It was a perfect opportunity to take a break from the monotonous schedules and a chance to have fun. It was a competition of skills and nerves and there were exciting prizes which were awarded to the winners.

## FIFA

In this gripping event, the competitors played a full-length game together. They were free to choose and customize their teams. The event was played on a knockout basis. This year Fifa also produced a houseful show and was thoroughly enjoyed by the participants.

## TECHIE TECHIE

As they say "Playing games you can artificially speed up the learning curve to develop the right of thought processes." The UPES CSI Hosted Yugank and organized "Techie Techie", a fun tech event that takes one through the enjoyable aspect of tech while playing games. This event comprised 3 rounds, each with its own unique style of fun activities while decoding clues. From eating 'gulab jamuns' while debugging to playing "rapid fire"; It was all about playing smart. Winning teams were awarded with lots of exciting prizes!

## TREASURE HUNT

One of our most sought-after events was "Treasure Hunt", an enigma of mystery, intuition, deduction and thrill. This year Treasure Hunt produced a houseful show where each team was subject to the same set of rules during this event. Various fun activities were planned in between for the participants to add a twist and make it more enjoyable.

## Inter-Committee

The event included participation from the newly appointed Committee Heads. It was a fun event and various games were played for ice-breaking sessions.

# EVENTS AT GLANCE

## CLICKATHON 3.0

"Taking pictures is savoring life intensely every hundredth of a second." It was a fun photography event to make college life groovier and help the participants unveil their photography and videography skills. Clickathon was a stupendous opportunity to make something extraordinary out of the mundane.

## Au Revoir

The chapter organized a farewell event for the batch graduating in the year 2021. In this online event various fun activities were planned.

## Hackathon

"Don't downgrade your dream to fit the reality, Upgrade your conviction to match your destiny." To turn the imaginations into reality we provided the canvas yet again with Hackathon 6.0. It was a platform to CREATE, SHARE INNOVATE. The event was made for the strong-willed, quick-witted and out of the box thinkers, with 48 hours of non-stop coding. It was an opportunity for the students to grow and gain experience in the field of coding. An electric crowd of like-minded individuals participated in the event and prizes of upto 1 lac was awarded.

## Capture the Flag

The event was hosted in collaboration with the UPES SPE Student Chapter. This event, 'Cyber Challenge: Capture the Flag' aimed at enhancing the coding acumen as well as its application within the industry. The purpose of this was to spread knowledge about the need for digitalisation in the industry and surely the critical and logical thinking, hacking acumen were elevated.

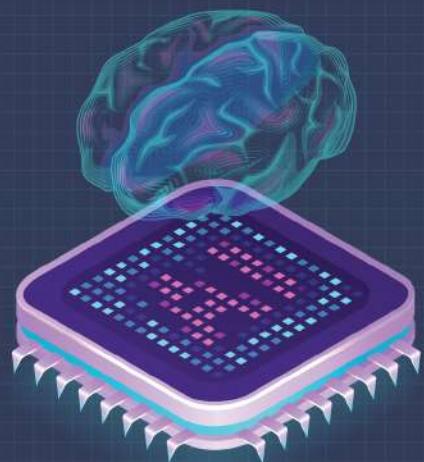
## Valorant

Often touted as the new CSGO, Valorant has gained immense popularity as the new 5vs5 team-based tactical shooter with a whole different flavor and challenge. The gamers tested their mettle and faced off in the intense battle to be the best by using their strategies, abilities and agents.

# 1. Brain Computer Interface

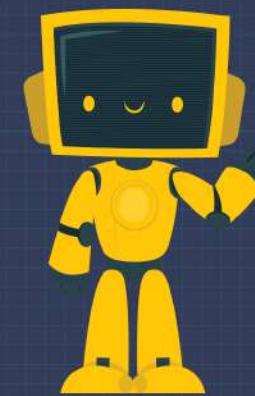
Imagine being able to control any device simply by thinking about it. This is what BCI is; a computer system that acquires brain signals, analyses them and translates them into commands which an output device interprets and follows.

Read about the uses, types and future of BCI right here and Nupur leads us through the amazing world of brains and technology.



# 2. Verbal Interfaces

Hey Siri, can you do my assignment for me ? We don't know if Siri can but we certainly know that Voice-User Interfaces are here and they are 'hear' to stay (see what we did here ?). Learn about the magic of using our voice to talk to machines as they intrude upon the many aspects of life.



# 3. Reflections

It was a long and tiring year for all of us, but never was it dull. We laughed, we cried, we learnt and we grew together as a family. Join Mehek as she takes you on a trip down the memory lane and shows you the side of UPES-CSI not seen often.



## 4. Gender gap in technology

Did you know that the world's first programmer was a woman? Ada Lovelace was the first person to realize that Charles Babbage's 'Analytical Engine' could be used for more than just pure calculations and devised the first ever algorithm. Yet about 50% of women abandon their technology careers by the age of 35. Read about the challenges and history of women in the tech industry in the inspiring words of Tanya

## 5. Tech News

In case you were living under a rock (either literally or virtually), fret not because Avi is here with an amazing recap of discoveries, inventions and technologies that blew our mind in the past year. AI, Electric Cars, Quantum Mechanics and much more, read it all here.

## 6. Space, Science and Technology

We all have looked up in the sky at night and just stared in awe at the countless stars dazzling us in a seemingly cosmic dance. Since early ages, humankind was mesmerized by the skies, respecting and revering it as a divine unknown. From devising charts using constellations to creating calendars using just the Sun's movement, there was just something about space which kept us hooked. Blast off into the world of space and technology with Akansha as we go on a ride to learn more.



## 7. Metaverse

Metaverse, a concept which needs no introduction yet remains in conspiracy and misinformation. Learn what the Metaverse is, what it was and what it will be and Ritesh takes us on a virtual tour.



## 8. Ways to get kicked out of your own house

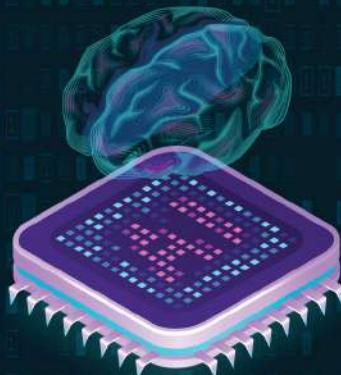
Engineer or Doctor ? Live-in or marriage ? Gay or not ? Dive into the mind of an brave teenager trying to live life through the chaotic advice of the most dreaded creatures in the world, Parents. We look at life through the funny lens of Shreya and contemplate about how the world has sped up, but will our parents be able to catch up ?



## 9. Zero-Knowledge Proof

What if we told you that you can prove you are right without even telling you are right ? Sounds too good to be true, right ? Learn more with Vidhi as we explore the world of 'Zero-Knowledge proof' and how it is used. If only we could use this in our vivas too, right ?

# BRAIN COMPUTER INTERFACE TECHNOLOGY



Nupur Sharma



A brain-computer interface (BCI) is a device that measures central nervous system (CNS) activity and converts it into an artificial outcome that substitutes, helps to restore, as well as improves natural CNS output, thereby altering the CNS's ongoing interactions with its external or internal environment. They work in the following steps: gathering brain impulses, analysing them, and then giving commands to a connected machine based on the signals they receive. BCI can be used for a variety of purposes, including neuro-feedback, regaining motor function in paraplegic patients, communicating with patients suffering with locked-in syndrome and increasing sensory processing.

All individuals experience maturing and the related physical growth, remembering changes for memory and mind work. These progressions might become weak prompting an expansion in reliance as the person grows. Numerous external help and instruments/devices have been created to permit more established adults and old patients to keep on carrying on with their lives in typical agreeable fashion. This smaller than usual audit depicts a portion of the new examinations on mental deterioration and engine control hindrance, determined to stop the ailment of harmless minds and to work on the wellbeing and health of more established adults and old patients. We depict the cutting edge of conceivable assistive BCI applications for controlling an exoskeleton, a wheelchair, and a home for old individuals with engine control disabilities. Depending on the method used to gather brain signals, BCI can be divided into three types, Invasive BCI, Partially Invasive BCI, and Non-Invasive BCI.

## Invasive BCI

Invasive BCI necessitates the surgical implantation of electrodes under the scalp to communicate brain impulses. The main benefit is that it provides more accurate readings. However, there are some disadvantages, such as surgery-related side effects. Scarred tissues may form as a result of the procedure, weakening brain signals. Invasive BCI research has focused on healing damaged vision and delivering new capabilities to paralyzed patients. During neurosurgery, invasive BCIs are directly integrated into the grey matter of the brain.

Invasive devices offer the highest quality signals of BCI devices since they are located in the grey matter, but they are prone to scar-tissue build-up, which causes the signal to become weaker, or possibly non-existent, as the body responds to a foreign substance in the brain.

Direct brain implants have been utilized to cure non-congenital (acquired) blindness Ophthalmology. William Dobelle, a private researcher, was one of the first scientists to create a functioning brain interface to restore sight.

## Partially Invasive BCIs

To some degree, Intrusive BCI gadgets are embedded inside the skull however rest outside the cerebrum rather than inside the dark matter. They produce preferred goal signals over painless BCIs where the bone tissue of the noggin(a development body tissue) avoids and misshapes flags and has a lower hazard of shaping scar tissue in the mind than intrusive BCIs. There has been a preclinical show of intracortical BCIs from the stroke perilesional cortex.

## Non-invasive BCIs

There have additionally been tests in people involving harmless neuroimaging advances as connection points. The significantly larger part of distributed BCI work includes harmless EEG-based BCIs. Painless EEG-based innovations and points of interaction have been utilized for a lot more extensive assortment of utilizations. In spite of the fact that EEG-based points of interaction are not difficult to wear and don't need a medical procedure, they have generally poor spatial goals and can't really utilize higher-recurrence signals in light of the fact that the skull hoses flags, scattering, and obscuring the electromagnetic waves made by the neurons. Generally, the best BCI for every client relies upon various variables.

The non-invasive brain-computer interface has the most un-signal clearness with regards to imparting with the mind yet it is viewed as exceptionally most secure when contrasted with other types. This kind of gadget has been viewed as fruitful in providing a patient the capacity to move muscle embeds and re-establish fractional development. A harmless procedure is one in which clinical checking gadgets or sensors are mounted on covers or headbands to peruse mind cues. This approach is less nosy yet additionally peruses flags less successfully in light of the fact that anodes can't be put straightforwardly on the wanted piece of the cerebrum.

Now, in conclusion, intrusive BMIs are completely body-embeddable and their advantages offset concerns, they could become satisfactory to most (patients). Notwithstanding, other, non-clinical worries must be tended to too. As non-intrusive BMIs permit admittance to the cerebrum, i.e., the person, all things considered, it is important to examine and direct socio-moral issues: protection, "mind-perusing," controller, cerebrum upgrade, which precisely legitimates control of possibly unsafe gadgets, risk, and at last self-discernment and insight through others. Is BCI ethical? BCI era is getting used for non-clinical applications, which includes gaming and human-technology interfaces. With this era comes some of moral issues that require attention via way of means of all stakeholders concerned researchers, clinicians, patients, and their families, etc.

# Verbal Interfaces

A voice-user interface (VUI) allows humans to communicate with computers by employing speech recognition to interpret instructions and respond to questions, as well as text-to-speech to play back responses. A voice command device (VCD) is a device that uses a speech user interface to control it.

Automobiles, home automation systems, computer operating systems, home appliances such as washing machines and microwave ovens, and television remote controls all include voice user interfaces. They're the most common way to communicate with virtual assistants on phones and smart devices.

Newer VCDs are speaker-independent, which means they can respond to a variety of voices independently of accent or dialectal influences. They may also reply to many commands at the same time, separate verbal signals, and provide appropriate feedback, precisely simulating a natural dialogue.

Various difficulties would need to be survived, in any case, for such advancements to happen. To start with, the VUI would need to be adequately complex to recognize input, like orders, and foundation discussion; if not, misleading info would be enrolled and the associated gadget would act sporadically. A standard brief, for example, the renowned "PC!" calls by characters in sci-fi Network programs and movies could initiate the VUI and set it up to get additional input from a similar speaker. Possibly, the VUI could likewise incorporate a human-like portrayal: a voice or even an on-screen character and keeps on conveying to and fro with the client to explain the info and guarantee precision.

Second, the VUI would need to work together with profoundly modern programming to precisely process and find/recover data or do an activity according to the specific client's inclinations.

Ishika Punhani



A previous couple of years has witnessed a speedy boom of hobbies within-side the use of verbal facts presentations in lots of carried out interface set-tings. However, it's still questionable what impact the presentation of verbal cues has on the spatial distribution of an interface operator's interest. In the existing study, it has addressed the privacy trouble via way of means of investigating whether or not centrally-provided spatially-nonpredictive verbal directional cues elicit an automated shift of visible-spatial interest within-side the route indicated via way of means of the cue. The consequenc-es confirmed that unmasked visual goal discrimination overall performance became facilitated at the cued relative to the uncued aspect on the shortest SOA following visual cue, however, became unaffected via way of means of auditorily-provided directional cues. Interestingly, our consequences addition-ally indicated progressed visible sensitivity at the auditorily-cued aspect within-side the masked goal condition. These findings are mentioned when it comes to the preceding laboratory-primarily based totally and carried out symbolic cueing research which has investigated the results of the presen-tation of the arrow, gaze route, and head orientation directional cues at the spatial distribution of interest.

Voice user interfaces are user interfaces used by speech. They are very in-tuitive because they use the most natural way of communication: speech. They are significantly faster than writing to enter information, but signifi-cantly slower than reading or viewing to send information from the comput-er system to the user. The first voice user interfaces were IVR, Interactive Voice Response, systems that allowed users to interact with a telephone system through the use of voice.



# REFLECTIONS

Mehak Aggarwal



"Without making mistakes, there won't be lessons learned. Without getting hurt, there won't be knowledge gained. The only way we grow is by learning from the past. "

The proud Student chapter just witnessed another glorious journey of the extraordinary team that came along with its ups and downs. Each event held this year uncovered lessons and inspiration for all, be it the backstage crew or the leaders on the front.

We treasured tons of memories all along. Some incidents taught us to be better as a team, and a few reflected on what one needs to improve on as an individual. Besides learning and introspecting, we did steal some moments of unbridled joy and laughter for ourselves to remember forever.

2022 bore hopes and expectations of a beautiful beginning. So many plans for an offline event after almost two years. But as they say "Life is what happens when you are busy making other plans.", thus came another period of lockdown that fortunately lasted just about a month. That long month did dampen our hopes and spirits, yet the team's determination to make Hackathon 6.0 the best and set new benchmarks rekindled the positive spark and filled the whole atmosphere with enthusiasm.

Well! Each up and down in the journey has a lesson hidden underneath. Sometimes, changing the perspective is the only solution to a problem. Thus, we began the preparation for the online Hackathon 6.0. The event was a tremendous success. The participants amazed us with their innovative ideas, and the organizing committee had a great time painting the canvas for those ingenious ideas. Just towards the end of the event, the most awaited news arrived- It was time to get back to the campus once again!

# REFLECTIONS

The transition from online to offline mode was hectic nonetheless, yet the excitement to be on campus and meet everyone surpassed it. Excitement and enthusiasm for the first official event of this year were reaching the sky. The events planned were just the perfect balance of fun and tech. Events planned to the finest of details may also have certain variables. As the events began, chaos unfolded. But what they say is "Chaos makes you stronger.", quick thinking from our potential team crossed all hurdles, and the event was a success. Sounds dramatic, right? Yet, this is the truth. Each obstacle had a lesson to reflect upon on the other side, which made our team stronger. The participants had a great day amidst their mundane schedules, and our team treasured the precious memories and lessons that came along.

With that done, we were only left with one last task to check off on our list, the yearly magazine- 'Identity-2022'. It is just a mini attempt from our side to compile and share the precious memories that we collected throughout the year. We hope you'll enjoy reading this as much as we enjoyed the journey of assembling it, for they say, "A work of art reaches the audience and teaches them exactly the way it was prepared".

# GENDER GAP IN TECHNOLOGY

Technology has become the epitome of the modern world. With the advancement in STEM culture, technology is inclining to become a male-dominating sector. According to a UNESCO report, women are under-represented in computing, engineering, mathematics and physics.

A study led by Accenture and girls who code, showed that 50% of women abandon technology careers by the age of 35 and that women are leaving tech roles at a 45% higher rate than men. Only 21% of women in the study said they believed the technology industry was a place they could thrive; sadly, that number falls precipitously to 8% for women.

Going back in history, the world's first programmer was a woman, Ada Lovelace. Modern computing emerged in the 1940s, during World War II, the military hired hundreds of women to solve complex calculations that would improve the accuracy of weapons on the battlefield. A Naval officer, Grace Hopper developed a compiler that translates English instructions into computer code which paved the way for the modern programming language. By the end of the war, women worked on a top-secret project, ENIAC (Electronic Numerical Integrator and Computer). The ENIAC, credited as the world's first general-purpose computer, for which none of the female programmers was recognized for their efforts nor known to the public until the mid- 1980s. Throughout the '50s and '60s, women often worked behind the scenes building software, while men specialized in hardware engineering. By 1984, women majoring in computer science grew 37%, twice what it is today.

The focus for men shifted from hardware engineering to software development. Men like Steve Jobs & Bill Gates became the paladin of the rapidly expanding industry. Pop culture gave rise to the stereotypical male, relentlessly telling us that men are better at science and technology. Women are discouraged from pursuing jobs in technology because of the 'brogrammer' tech culture brought in from college.

Another reason for the gender gap is that fewer women are studying technology-based subjects at school and university, implying that employers have fewer options to recruit women in technology. The reason can also boil down to the lack of female role models in the tech industry for young girls to follow in their footsteps and study these subjects.

Women developed computer science- not just men. Technology is not male or female, and remembering that is a key step for rethinking inventions and bridging the gap.

Tanya



# TECH NEWS

Avi Aggarwal



## *Virtual reality*

Despite it being a relatively nascent technology, the adoption of virtual reality across companies, organizations, and even governments worldwide has been widespread and given the potential and benefits of virtual reality technology, the demand for AR and VR headsets is set to gain further traction in the near future.

But what is virtual reality anyway...?. It is a digitally created, three-dimensional environment generated by showing an image on small screens in a headset that you wear, making your eyes think that you are actually in that environment and you can also move your head around to explore the whole location you are in. To put it simply, It places users in a simulation and allows them to fully immerse themselves in a different world. One of the main areas it is used in is gaming, creating a fully immersive experience like you are actually inside the game, whether that be in a first-person shooter or a driving simulator.

Now we look at some technologies that are incorporated with VR:

- LiDAR (Light Detection and Ranging)
- Hand detection and eye tracking
- Robotic Boots
- Sensation

## LiDAR (Light Detection and Ranging)

It is used to create a 3D map of surroundings which provides a sense of depth to AR creations instead of them looking like a flat graphic. It also allows for occlusion, which is where any real physical object located in front of the AR object would block the view of it. For eg: a desk blocking out a Pokémon GO character on the street. This is vital for making AR creations appear more rooted in the real world.

## Hand detection and eye tracking

These are two prominent examples of the built-in technology that is incorporated into VR headsets. Hand detection allows VR users to control movements so they can be more expressive in VR and connect with VR experience on a deeper level. The inclusion of eye-tracking technology allows the system to focus the best resolution and image quality only on the parts of the image that the user is looking at (similar to how the human eye works). This taxes the system less, reduces lag and reduces the risk of nausea.

## Robotic boots

Startup Ekto VR has created wearable robotic boots that provide the sensation of walking, even though you're actually standing still. The Ekto One robotic boots look a bit like futuristic roller skates except, instead of wheels, they have rotating discs on the bottom, which move to match the direction of the wearer's movements.

## Sensation

We already have things like haptic gloves, which simulate the feeling of touch through vibrations. But what about full body suits? In fact, full-body suits are already available – the TESLASUIT being one example – but they aren't exactly affordable for everyday VR users yet but will probably become more affordable, mainstream, and effective in time, providing yet another leap forward for VR.

It will be exciting to see where this tech goes in the future as it has already made such a big improvement in the last decade.

# ARTIFICIAL INTELLIGENCE

AI is a really clever and a big advancement on the tech we have had in the past. It can be used in all sorts of applications from solving calculations to voice assistants like Siri and Google Assistant. AI is also being used in driverless cars to help understand the road and make snap decisions in dangerous conditions. In 2017 Scientists at Facebook created 2 AI robots instructed to negotiate with each other over things like swapping one item they each owned with the other robot, to see if they could develop negotiation and bartering skills.

They advanced so much that they began to talk in their own language which no one else could comprehend, so the project was eventually shut down due to concerns. This may paint pictures of robots running around with their own minds taking over the world, but in reality, it can be controlled and used to help us with problem-solving in the future.

The concept of Artificial Intelligence (AI) and Machine Learning (ML) is considered to be cutting-edge solutions that help the modern-day businesses to solve complex problems, initiate as well as automate tasks, and ultimately serve their customers in a better way. It has been estimated that the worldwide AI, as well as Machine Learning market income, would rise from 7.35 billion USD in the year 2018 to 89.8 billion dollars by the year 2025.

The AI-enabled machine learning programs are even helping to create smart websites that serve multiple purposes for the organization and aid them to garner consumer attraction.

Tasks such as text summarization, data digitalization, language translation, or even reporting are now performed with the help of AI-based software and programs. Organizations are also using AI to create intelligent conversational chatbots that can give their customers excellent service, almost instantly.

# SPACE AND TECHNOLOGY

Akansha Raghav



"All space projects push the frontiers of technology and are drivers of innovation."

Space always stimulates everyone's eyes irrespective of any distinction. Space science, specifically speaking has been admired since the beginning of the human race. It has been a topic of discussion, revelation and awe since centuries. There is a misconception about space science that it is about stars and planets only and surroundings nearby our planet Earth. Rather, it is a much wider term that involves the hows and whys of the universe, questions the very existence of life and evolution.

Science & Technology is to promote the exploration and research of space worldwide, to lead the rapid integration and technological breakthroughs of interdisciplinary sciences in the space field, and to build a high-level academic platform for discussion, cooperation, technological progress. Space science combined with technology is a boon to the world today. Many different aspects are there to this topic. There are people who still believe that there is no point of doing work in space science and it is wastage of technology and resources to invest in this area. But considering the today's scenario of how difficult it will be to live on the planet earth in next few decades, it is necessary to look after all the needs of human population and other inhabitants. Further, one must be aware of how universe is working in order to understand the laws of nature which drives all the activities happening.

As a matter of fact, it is so easy to relate that more we understand our universe better, easier it will be for us to develop the technology and invent new things for our convenience and which does not cost our nature. Even after several discoveries, theories and inventions; humans are far behind in knowing this universe completely. Many hidden objects are yet to be known.

Worldwide scientists are constantly working on developing different technologies that can help us access the more information and data about our universe. Many discoveries like that of black hole led to revolution in space science and this was all possible due to the technological advancement that we as humans have made. Space missions are one of the revolutionary combinations of space science and technology.

Many space missions are happening all around the world in order to delve into better understanding of space. Few popular space missions in history are: Voyager, Pioneer, Chandrayaan 2, Aryabhata and many more. These missions have led to miraculous discoveries and has proven how far we can reach and still has lot to reach.

Speaking about my personal interest in this is that I have always been fascinated by space and its aspects. Since the time I started learning about space science and technology, there was no come back. In today's world where field like AI are too much admired by people; Space science does not sit behind. It, in fact, also use AI to get better every day. The biggest advantage of space science is that any kind of technology can be used for this field. With time many more discoveries are yet to be done with the advancement of technology.

And one must never forget that:

**"Curiosity is the essence of our existence"**

# METAVERSE

Metaverse is a digital space represented by people, places, and things. It is a digital world created using digital objects. Simply put, it works like Microsoft and Zoom meetings, which lively represent us on other persons' screens or desktops.

Ritesh Bhandari



Virtual reality helps to live in the moments of different places through 3D illusions using headsets. AR helps enhance the real-world operating computer-generated perceptual information, including visual, auditory, and olfactory.

**Why Metaverse will become the next big thing?**

The internet has always enabled the digitization and dematerialization of our world.

The metaverse will accelerate this due to:

- Increasing real-time activity :- interactive;
- More playful experiences — creating not only the next generation of entertainment
- Re-decentralization — putting power and sovereignty back in the hands of creators, consumers, owners, independent companies, etc.
- Evolving virtual societies — the emergence of new forms of communities and cooperation as people get involved with all of the above.





"Metaverse" is currently a major buzzword in the worlds of tech, business, and finance, and like all buzzwords its definition is fuzzy, contested, and shaped by the ambitions of the people using it.

## Inside the metaverse, users can:

### 1. Purchase and monetize real estate

Real estate sales are among the top use cases for the Metaverse, with individuals and organizations eager to become early movers into this space. Metaverse platforms are divided into land blocks called parcels, which can be purchased using the environment's unique cryptocurrency token. Once you purchase real estate, you can sell it at a higher value, or lease it to a property developer or VR event organizer for monetization.

### 2. Create scenes, games, and other VR experiences

Some Metaverse platforms also include built-in tools, where users can create in VR and not just experience it in a passive manner. For example, Horizon Worlds offers pre built layouts, sounds, physics properties, shapes, and much more, to help users craft their own VR worlds. This could be a simple "hangout" space for personal use or a layered gaming experience for multiple participants.

### 3. Meet, socialize and collaborate with remote colleagues

The Metaverse will revolutionize remote work by bringing the intimacy of in-person interactions into a digital space. VR platforms like Mozilla Hubs already support this capability to a degree, and the Metaverse takes it a step further by allowing entire offices and building campuses to exist in a virtual world.

Users can leverage collaboration tools like an infinite whiteboard canvas, persistent spaces, and VR keyboards to work with their colleagues.

### 4. Shop for real and virtual products

The Metaverse allows users to interact with products in a way that is impossible via e commerce or online stores. One's avatar can enter a virtual shop, walk through the aisles, try out products such as apparel or shoes, and make payments directly in cryptocurrency. Users can either buy virtual products for their avatars or initiate a real world purchase and have the product delivered later.

# Ways To Get Kicked Out Of Your Own House

Shreya Panwar



A delightful yet chaotic morning that started with another quarrel. "Engineering or Medical" these words echoed around the whole house. Young adulthood comes with loads of responsibilities and that involves choosing a career for yourself. Being typical Indian parents "engineering and medical" are the only fields they have ever known and choosing a field out of the above-mentioned options is one of the best ways to get kicked out of your own house. With such parents, it's an unwinnable race, either accept what they want or be a disappointment forever. Life becomes an abiding hell when such options are forced upon you. It takes a tremendous amount of guts to go against your parent's decision. Most of us accept the life planned by our parents because it's easier to just blame them for several broken parts in their script designed for us. I agree that parents want nothing but a good future for their children but what they refuse to realize is that they are just trying to mould all of us into one perfect square which is certainly not possible. A remarkable example of such a case is the blockbuster movie "3 Idiots". I am sure we all have seen it more than once. Nobody but the child under pressure can understand the situation parents put them in.

"Parents like to think of themselves as Batman, and of their children as Gotham Cities. Gotham City depends on Batman for its survival, and Batman delivers. This belief prevents parents from letting those young adults live their lives." — Lukasz Laniecki.



Another great way to get kicked out is to be part of the queer community. I have met a wrongful amount of Indian parents who possess the mentality that people belonging to a queer community are just mentally sick and hearing this always boils my blood. A lot of people have been banished from their homes simply because they tried to express themselves in a way different from what is "accepted" by our society. Mocking the queer members and just taking them for granted is only going to make them despise society and their parents more. Although, times are changing and many parents out there do support the LGBTQ+ community but there are still loads of parents who are even disgusted by the same. I have even come across people my age who demur against the queer community and are huge homophobes. What do you think could be the reason? Values learnt at home play a major role in our life but what if our teachings at home need to get modernized? It is often seen that if parents frown at the people of queer identities then that hatred will be passed on to their children as well.

Nowadays, our Indian community is getting more open-minded. Even Bollywood is trying to spread awareness through movies like *Ek Ladki ko Dekha Toh Aisa Laga* starring Sonam Kapoor Ahuja and Anil Kapoor, *Kapoor and Sons*, *Aligarh*, *Shubh Mangal Jyada Savdhaan* and many more. I know a few bi and trans people through online platforms and they often tell me about how most of them are afraid to come out. They fear how their parents will react and how society will see them. All queer members want is their parents to accept them and say that It's OK to change their minds a million times and figure out what works for them. It's OK to take their time.

There's something special about a woman who dominates in a man's world. It takes a certain grace, strength, intelligence, fearlessness and the nerve to never take no for an answer. But sadly women leading a household is also something that is pitied by parents and not accepted by our society. Terms like frigid are used for such strong women. Though again even in this factor, India is evolving but there are still many households in our nation that don't accept the fact that women can be the primary source of economic support for their families. Our country can develop in a short period only if more and more people become broad-minded. But no, some short-sighted people would rather want their women inside homes and going against them can get you out of your home in the blink of an eye.

Another jaw-dropping thing for parents is the fact that their grown-up kids prefer a live-in relationship before marriage or maybe no marriage at all. Let me just straight up spit facts. Be it, adults or young adults, they are in a live-in relationship if they want to even behind their backs. I believe that a live-in relationship doesn't always end up being a disaster if you are already made aware of it by your parents. A live-in relationship saves you from a grievous marriage. A live-in relationship offers more independence, both legal as well as financial, than marriage. There is deeper bonding in live-in relationships due to no pressure from society and therefore less chance of divorce. But most Indian parents are absolutely against the live-in relationship. I think we have all seen or heard of the movie "Luka Chuppi". A little sneak peeks of how live-in relationships are seen in society and how it pressurizes parents as well. Being in a live-in relationship can be a good reason for your parents to throw you out of your own home if they get to know about it.

Of course, I won't ever deny the fact that not all parents are like how I portrayed them but all over the nation, there are still many people out there who face issues as I mentioned above.

Everything is changing, the world is evolving at its own pace and I think we should all contribute to our development by being more flexible and unbiased. Open-minded people do not impose their beliefs on others. They accept that we all have a different perspective on life and our own thing in peace without judgment. So I have given you ways to be dismissed from your own home.

Do "not" try them out at your home.



# ZERO-KNOWLEDGE PROOF

Vidhi Asawa



Business networks are becoming increasingly user-centric rather than site-centric, thanks to the widespread adoption of cloud-based computing and the proliferation of linked devices and IoT emerging technologies. The trend is being accelerated by the growing transition to hybrid work. Organizations must be prepared for the movement of people, devices, transactions, and access to corporate data to be unpredictable. There may be times when employees alternate between working in an office and working from home. Customers are more likely to transact with businesses on a regular basis in a digital environment, affecting the purchase process for entire industries. In an increasingly connected and scattered environment, security leaders are turning their attention to protecting personnel, devices, and systems from possible cybersecurity threats while businesses adapt. Traditional perimeter and detection-based techniques are giving way to Zero Trust principles as security advances to the endpoint.

What if I told you that there's a mathematical technique where you can prove you are right without even telling anyone what it is that you are right about. Sounds impossible, don't you think? How can one possibly prove that a secret he knows is true without telling anyone the secret?

This is where the Zero-Knowledge proof comes in. It is a special type of interactive proof in which one party demonstrates they know something without giving away any information. Completeness, soundness, and Zero-Knowledge must all be met for a Zero-Knowledge proof to be valid.

The study was rejected numerous times so you are not the only one if you doubt the existence of Zero-Knowledge proof and the early reviewers of the creative paper must not have realized they were conceivable either. When it was ultimately approved, its inventors, Shafi Goldwasser and Silvio Micali received the A.M. Turing Award from the Association for Computing Machinery, which is widely regarded as the highest honor in computer science and is sometimes referred to as the "Nobel Prize of Computer Science."



There were no "real-world" uses of Zero-Knowledge proof just six or seven years ago, but that has changed as Cryptocurrency has grown in popularity. Bitcoin's creator had to choose between trust and privacy when creating the first cryptocurrency. It was necessary to have a permanent, unchangeable public record of every Bitcoin transaction in order for people to believe they were not being duped. The Blockchain is a technology that will have an impact on not only the future of money but also autonomous vehicles, renewable energy, and digital identity. It's a far-reaching concept that extends beyond money. The problem is that if that one person paid for something using Bitcoin, that transaction is public. Anyone can see that this particular person paid for it. That's a significant breach of privacy. So here's where zero-knowledge proofs come into play. People don't have to make such public transactions with some cryptocurrencies.

Zero-knowledge-proof algorithms have progressed to the point where they may now be used to verify the blockchain without revealing its contents. The contents of each transaction's record on the blockchain are kept hidden, and these proofs are used to verify that the record is correct without disclosing any information.

Another great feature of zero-knowledge proof is that they exist for every mathematical claim that has proof. A proposition is simply a true or incorrect mathematical statement. Zero-knowledge proofs turn proof into an interactive game between two players, rather than a static object that anyone can pick up and read. This is a significant development in the fields of computer science and cryptography.



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