



RESURGENCE



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TEZPUR UNIVERSITY PRESENTS



TECHXETRA SOUVENIR 2024

Team TechXetra condoles the passing away of Mihir Kanti Chaudhuri, Ex-Vice Chancellor of Tezpur University



21 July 1947 – 13 December 2024

Mihir Kanti Chaudhuri, an eminent inorganic chemist and former vice-chancellor of Tezpur University, passed away on 13 December 2024, at the age of 77. Known for his groundbreaking work in the synthesis of dioxygen complexes and fluorine compounds, his illustrious career included key roles at IIT Guwahati, NEHU, and Tezpur University, which thrived under his leadership and was recognized as the Best University in India in 2016. His contributions to Indian science and education remain unparalleled. May his soul rest in eternal peace.



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Message from Vice Chancellor

I am happy to see the successful completion of TechXetra, our techno-science festival organized by the School of Engineering. This vibrant event highlights our spirit of innovation and creativity that thrives within our university. The technical extravaganza has been organised with renewed vigour and a compelling theme: "The Odyssey to a Greener Tomorrow: Engineering Earth's Future."

As we grapple with the pressing issues of climate change, environmental degradation, and resource scarcity, the role of higher educational institutions in shaping a sustainable future becomes increasingly significant. This event provides a platform for young, innovative minds to converge, collaborate, and explore solutions that will not only address these challenges but also propel us towards a greener tomorrow.

TechXetra offers a diverse array of activities, from thoughtprovoking keynotes delivered by industry leaders to hands-on workshops that give an opportunity to young minds to innovate and learn practical skills.

I extend my heartfelt gratitude to the organizing committee for their tireless efforts in making this event successful.

Date: 10.12.2024

MESSAGE FROM Dr. Rosy Sarmah Associate Professor, Tezpur University



It is a matter of great pride and privilege to pen these words for the souvenir of TechXetra 2024. TechXetra 2024 makes its much-anticipated comeback after 7 years with the theme: The Odyssey of a Greener Tomorrow: Engineering Earth's Future. The choice of this theme emphasizes the crucial need to focus on applying cutting-edge technology and scientific insights to create a more sustainable and eco-conscious way of living.

TechXetra 2024 is a testament to the power of teamwork, the pursuit of knowledge, the courage to challenge limits and a celebration of innovation and technology. Every activity, every competition and every discussion during this festival represents a step forward in exploring new ideas and fostering collaboration among students, professionals and enthusiasts.

This souvenir serves as a timeless record of the memories, milestones and efforts that have gone into making this year's event a remarkable success. It stands as a tribute to the passion and perseverance of everyone involved, from the organizing team to the participants and supporters.

As we celebrate the achievements of TechXetra 2024, let us also remember that this is not the culmination but the beginning of many new endeavors. I encourage everyone to carry forward the knowledge and experiences gained here, using them to create meaningful impacts in the fields of technology and beyond. My heartfelt gratitude goes to the entire team, whose hard work and dedication have made this event a reality. May the spirit of TechXetra continue to inspire us all to innovate, collaborate and strive for excellence. Best wishes,

Rosey annah

(Rosy Sarmah) Faculty Coordinator, TechXetra 2024

Dated: 25th Nov 2024



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Words from the Student Coordinators

TechXetra 2024 has been an incredible journey. Witnessing the culmination of months of hard work, dedication, and innovation from students, faculty, and guests alike has been truly inspiring.

This magazine serves as a testament to the spirit of TechXetra – a celebration of knowledge, creativity, and the pursuit of excellence. It captures the essence of the events, the excitement of the competitions, the brilliance of the minds that came together, and the lasting impact of this unique experience.I extend my heartfelt gratitude to the entire TechXetra team – the organizing committee, volunteers, sponsors, and everyone who contributed to making this festival a resounding success after a hiatus of 7 years. To the participants, I commend your passion, perseverance, and the innovative spirit you displayed. May this experience inspire you to continue exploring the boundaries of knowledge and strive for greater heights.

TechXetra 2024 has not only been a showcase of talent but also a platform for fostering collaboration, learning, and growth. I believe that the connections forged during this festival will continue to inspire and empower us in our academic and professional pursuits.

Let us cherish the memories of TechXetra 2024 and strive to make the next edition even more spectacular.

With gratitude and enthusiasm,

Sukanya Kumari Subhranandan Deka Joint Student Coordinators TechXetra 2024

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Being on the other side... my journey through TechXetra

Dr. Somnath Paul Joint Faculty Coordinator, TechXetra 2024 Assistant Professor, Department of Applied Sciences Tezpur University.

"As I sit down to pen my experience with TechXetra, the annual technical festival of Tezpur University, I am filled with a mix of emotions - nostalgia, excitement, and a sense of accomplishment. My journey with TechXetra has been a long and winding one, spanning multiple roles and chapters."

Chapter 1:- A Breath of Fresh Air... a research scholar's perspective

It was 2011. A year earlier, I had started working at the university as a PhD student in the Mathematical Sciences department. Since I was raised in a rural region, I must admit that I was unaware of what a technical fest was. Social media and the internet did not have as big of an impact back then. As a result, my mind was a blank slate when I first encountered TechXetra 2011.

The event was a welcome change of pace for me as a research scholar, who is frequently lost in the lonely world of academia. It was energizing, the lively environment full of youthful, eager minds. Seeing the creative ideas and inventive projects on display was motivating. A muchneeded respite from the daily grind, the event gave attendees an insight into the fascinating realm of technology and its many uses.

Even though I prefer soft bands, I had never heard of Metanoia 2011, a hard rock band competition. The mood was entirely different from anything I had ever experienced. However, my desire for band music was satiated at TechXetra 2012 when my all-time favorite, Euphoria, one of the oldest and most wellknown bands in India, played on the campus playground. Even after twelve years, I can vividly recall that evening.

Chapter 2:- A Glimpse into Innovation...a guest faculty's perspective

As I advanced in my academic career, I was hired as a guest faculty in the Department of Mathematical Sciences at Tezpur University in 2014. Even though I was a member of the School of Sciences, I had the opportunity to attend TechXetra because I was assigned to the majority of the B.Tech courses.

Despite not being a direct member of the organizing committee, I was enthralled with the participants' vigor and excitement. The workshops, hackathons, and technical contests were really amazing. The chance to interact with youngsters from various backgrounds and discover their creative ideas was fantastic.

This experience lasted till August 2017, when I departed from this university and started working as a permanent faculty member at PDUAM, Behali. Since my workplace was close to Tezpur, so I was able to keep up with the university's many advances.



Chapter 3:- The Halt...an outsider's perspective.

I had intended to attend TechXetra 2017, however I was unable to do so because of an essential obligation in November 2017. But regrettably, I learned some bad news about it. My Alma matter was being defamed by a lot of things that were circulating, some of which were real and some of which were flavored heavily.

I was initially shocked by what I had heard; in fact, my mind was not prepared to absorb it at all. The fresh air I had breathed initially was now contaminated. I'm not sure who made the error because, at the time, I was an outsider and lacked access to the sensitive material.

I was saddened and disappointed because there was no TechXetra after that year, so I wondered if the students would ever get the chance to show off their skills and inventions again!

Chapter 4:- A Journey of Triumph...a faculty coordinator's perspective

After two and a half years, my destiny has brought me back to this university again. This time, as a very much integral part of the School of Engineering, I joined the Department of Applied Sciences as a regular faculty in 2019.

Then COVID struck, completely altering the way of teaching learning. The students' names are shown on the computer screen as colored bubbles on a black backdrop. I missed the interaction of being in a real classroom and participating in the students' educational journey. My enjoyment of being a teacher was being diminished in some manner by this. Without students, the university campus seemed deserted and lifeless.

Fortunately, COVID was over and students were back on campus. However, I can tell that pupils' perspectives have changed since COVID. There were some issues with the link between teachers and students. Everything appeared so mechanized. On such an evening in 2022, I received an order from the Dean SoE, that TechXetra is about to revive and I was nominated as one of the three core members of the organizing committee. I could sense that there are tough times coming ahead and I was not at all ready for it.

Due to some unknown reasons, there were no talks of TechXetra after that order for almost one and half year and I was about to forget it. Then some inspiring bunch of students came to me with the information that we are meeting for the first time to discuss about TechXetra 2024. Seeing their enthusiasm, I could feel that the damage done in the student-teacher bond can be repaired through this kind of activities and I ended up becoming the joint faculty coordinator of the event.

It was an emotional rollercoaster for me. The thrill of preparing and planning the event was quickly eclipsed by the unforeseen difficulties. Although it was a significant setback, the sudden stop also strengthened the resolve to conquer challenges. The team came together, and we resumed the event with newfound energy. With the help of my coworkers and the students'

passion, we put in a lot of effort to plan TechXetra 2024. The festival, which featured creative projects, thrilling competitions, and motivational guest lectures, was a huge success. As the joint faculty coordinator, I felt an overwhelming sense of pride and accomplishment, knowing that we had revived a beloved tradition and provided a platform for the students to shine.

Inspiring future generations of students, TechXetra will undoubtedly continue to be a shining example of creativity and innovation as it develops and grows.

"Ab tumhare hawale, TechXetra saathiyon..."

Nature and Humanity: The Role of Tezpur University

Dr Mousumi Mahanta, Assistant Professor Women Studies Centre, Tezpur University.

Nature, in its infinite beauty and diversity, is more than just a backdrop to human life; it is the foundation upon which all life thrives. Loving nature is not merely an emotional or aesthetic choice but a vital philosophy that underpins the well-being of our planet and ourselves. In a time when environmental crises loom large, nurturing a deep love for nature is crucial for fostering respect, sustainability, and harmony between humanity and the natural world. Humans have an intrinsic connection to nature. From the clean air we breathe to the food and water that sustain us, nature is the ultimate provider. Beyond physical needs, it also nurtures our mental and emotional well-being. Scientific studies have shown that spending time in natural environments can reduce stress, improve mood, and enhance cognitive function. By appreciating nature's generosity, we develop a sense of gratitude and responsibility to protect it. Nature is not just a part of life; it is life. It is the source of air, water, food, and the myriad elements that sustain our existence. Without it, humanity cannot thrive. Loving nature is more than a sentimental connection; it is a profound acknowledgment of our dependence on the natural world and a commitment to its preservation. In this relationship lies the key to human survival, emotional fulfillment, and global harmony. Nature is humanity's lifeblood—its ecosystems provide the essentials that keep us alive. Forests produce oxygen and regulate the climate, rivers supply clean water, and soil nurtures the crops we eat. This intricate web of life works seamlessly to maintain balance, yet it is fragile and vulnerable to human actions. A deep love for nature fosters an awareness of these life-supporting processes, reminding us to tread gently and respectfully on the Earth.



Beyond physical sustenance, nature is a wellspring of emotional health. A walk in the woods, the sound of waves crashing on a shore, or the vibrant colors of a sunset can calm the mind and lift the spirit. This emotional connection to nature is crucial for our mental well-being. Studies have shown that being in natural settings reduces stress, anxiety, and depression. By embracing a love for nature, we also nurture our own inner peace.

Humans are not separate from nature but an integral part of it. Every breath we take is tied to the green canopy of forests; every bite of food links us to the soil. Loving nature means recognizing this interconnection and respecting the delicate balance it requires. Actions that harm the environment—pollution, deforestation, and overconsumption—ultimately harm us as well. Conversely, by protecting nature, we secure our own future. Love inspires action. When we love nature, we are driven to protect it. From reducing plastic use to participating in reforestation efforts, every small act of care contributes to the larger goal of conservation. This love also fosters innovation, encouraging sustainable technologies and practices that ensure a harmonious coexistence with the planet. It is through love that humanity can transform from a consumer to a steward of the Earth.

Animals are an integral part of nature's intricate web of life. From the tiniest insects to the largest mammals, each animal contributes to the balance and health of ecosystems. Their roles in pollination, seed dispersal, nutrient cycling, and maintaining population dynamics make them indispensable to the natural world. Understanding and appreciating the importance of animals helps us recognize the profound interconnectedness of all living beings and the need to protect biodiversity for the planet's well-being. Animals play diverse and vital roles in maintaining ecosystem health. Herbivores, like deer and rabbits, regulate plant populations, while predators, such as lions and eagles, control herbivore numbers to prevent overgrazing. Scavengers, like vultures, clean up dead matter, reducing the spread of disease, and decomposers, such as insects and fungi, break down organic matter, returning nutrients to the soil. These interactions create a balance that sustains life across the planet.



The presence of animals is a marker of biodiversity, which is essential for ecosystem resilience. Diverse species ensure that ecosystems can adapt to changes and continue functioning despite challenges such as climate shifts or invasive species. For instance, a variety of pollinators ensures plant survival even if one species declines. The interdependence of plants, animals, and other organisms underscores the importance of protecting all forms of life to preserve ecological harmony. Animals are not only essential for ecosystems but also deeply connected to human life. Livestock, like cows and chickens, provide food, while working animals, such as horses and elephants, have supported agriculture and transportation for centuries. Beyond utility, animals bring joy and emotional support as pets, companions, and symbols of cultural significance. Their presence enriches human lives, emphasizing the need to treat them with compassion and respect. Despite their importance, animals face numerous threats due to human activities, including habitat destruction, pollution, climate change, and poaching. The loss of animal species disrupts ecosystems, leading to a cascade of negative effects. For example, the decline of pollinators threatens global food production, while overfishing destabilizes marine ecosystems. Protecting animals is, therefore, essential not only for their survival but also for the health of the planet and human societies.

Tezpur University has emerged as a prominent habitat for diverse flora and fauna. Besides serving as a residential campus for students, it has also become a sanctuary for various animals, encompassing both wild species such as reptiles, monkeys, and civets, as well as community animals like felines and canines. The proximity of Strays/ community animals, basically the dogs and the cats to the residents of the campus necessitated the establishment of harmonious human-animal coexistence within the University premises and nearby localities. The inception of the Animal Welfare Club took place during the autumn semester of 2018, shortly after the newly elected TUSC body came into existence. The club's primary objective is to be the voice for all animals, ensuring their well-being while fostering a healthy coexistence between the university community and these animals.



Additionally, the club aims to manage all animal-related issues in a systematic and organized manner. The club was spearheaded by individuals who had consistently advocated for animal welfare even before its formal establishment.

Nearly 30 years ago, WHO and the World Society for the Protection of Animals (now called World Animal Protection), collaborated on the publication of Guidelines for Dog Population Management, which proposed a long-term method for the control of stray-dog populations by means of a methodical sterilization programmed. The Supreme Court of India has directed that sterilization or vaccination of stray dogs be carried out in accordance with the Prevention of Cruelty to Animals Act, 1960 and the Animal Birth Control (Dogs) Rules, 2001. In addition, sterilization prevents suffering, extends life for females, and reduces fighting and subsequent injury in males. Combined with rabies vaccination sterilization is now globally recognized as the most effective and human way to control population and spread of disease. ABC-ARV projects, operating throughout India, are the legally prescribed method for dog population and rabies control, endorsed by the World Health Organization. In compliance to "Prevention of Cruelty to Animals Act, 1960 and the Animal Birth Control (Dogs) Rules, 2001" Strategies were adopted to minimize the human -animal conflict and at the same time provide a quality life to the community animals . This included yearly mass anti rabies vaccination of the community animals in and around the university campus by collaboration with District animal husbandry veterinary office- Sonitpur, North east Small Animal Practitioners Association and Just Be Friendly-Guwahati (Jbf). Animal welfare Club of TU also initiated caregiving to the animals by feeding them one meal per day at designated places (so as to curb aggressive fights among themselves as well as intrusion to hostels, eateries). The regular feeding pattern helped them to become healthy and physically fit for sterilization. In addition, it also helped us catch them without difficulty for the same. Adoption camps have also been initiated for getting the pups and kittens of unspayed animals. Club has have been rescuing the accidental and diseased animals and rehabilitating them post treatment and encourage their adoption.



Additionally, the club aims to manage all animal-related issues in a systematic and organized manner. The club was spearheaded by individuals who had consistently advocated for animal welfare even before its formal establishment.

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Villainous Traps Can Turn into Spy Heroes for MOS Researchers

Rupam Goswami, Assistant Professor Department of Electronics and Communication Engineering, Tezpur University.

Background of the Story

Semiconductors have always fascinated the world, not merely because of their inherent properties, but because of their contribution to global economics. Today's civilization stands on the giant shoulders of the semiconductor industry. To sustain the demands of the Moore's Law, transistor scaling led to the hunt for devices with modified architectures or newer principles of operation like the fin shaped field effect transistors and the tunnel field effect transistors.



schematic of a MOS structure showing the basic analogy for traps and a cartoon of random telegraph noise signal

Introducing the Villains

Interface quality is an important factor in MOS (metal-oxide-semiconductor) devices, particularly the oxide-semiconductor interface because that is where the *prime action* is. The existence of traps (*can be imagined as unwanted energy states in the form of defects*) at the oxide-semiconductor interfaces is known to cause fluctuations in the carrier density and mobility, which is extremely undesirable for conventional low power applications.



In a broader analogy, interface traps act as villains to device performance, kidnapping the carriers randomly and releasing them randomly. This is illustrated through Figure 1 where the carriers (*a few happy children*) start from the source of the MOS device, and move towards the drain (*their destination of ice-creams*) by action of an electric field. A few trap states which act as energy centres capture the carriers (*sad, unfortunate children*) and fundamentally reduce the population of carriers at the surface of the device, leading to degradation in drain current. A condition where at least a single active trap state causes this capture and release leads to creation of a randomly varying signal known as the random telegraph signal (RTS) which is a representative of the random telegraph noise (RTN).

Villainous Traps as Spy Heroes

With the advancement in technological tools and computer aided design (CAD) of semiconductor devices, prediction of performance of devices have become convenient for engineers and physicists. The presence of a wide range of physicsbased models for device simulation has enabled researchers to invent novel techniques of assessing device performance. Single traps on TCAD (technology CAD) tools can be an effective method of understanding the impact of interface quality on the device performance. Since TCAD tools offer a method to locally place a single trap at a user-defined position on the interface (ideally the straight line separating the oxide and the semiconductor), therefore, the user has the facility to observe how the device responds to the positioned trap. Additionally, and more importantly, the resultant electrical parameters (degree of current degradation, electron current density profile and electric field profile) can be observed to conclude which part of the interface in a MOS architecture is more sensitive to traps. As a whole, interface traps which were supposedly villains in nature turn into spy heroes to help the engineer figure out the most important positions in the interface. On the other hand, the amplitudes of the RTN signal arising out of the traps can be effectively used to generate true random numbers because the time instants at which the signal rises and falls are random in nature.

"Negativity can be transformed into positivity."

PRIME TIME

Reema Joshi, Asst. Junior Professor St. Edmund's College, Shillong, Meghalaya.

I always thought prime numbers were a bit odd, turns out 2 is an exception! Eratosthenes of Cyrene, a Greek astronomer, mathematician and poet, emerged as the first person to calculate the circumference of the Earth about 2,300 years ago. Among his prime contributions was the Sieve of Eratosthenes, a method for generating successive primes. Read along to know how this mathematician's contribution made him a prime figure in the field of computing as well.

What are primes? Any integer which cannot be broken down into constituent factors other than 1 and itself is a prime. 7, for instance is a prime, while 8 (8 = 4 x 2) is not. The great mathematician Euclid long ago established the infinitude of primes. Prime numbers are so called because they are the building blocks for whole numbers. Every integer (>1) can be broken down into a product of primes using the prime factorization method we all learnt in high school (4 = 2 x 2, 21 = 3 x 7, etc.). See if you can add more to the list.



Dabbling with primes is more fun when we observe its imprints in nature. Interestingly, the Cicada insects appear every 7, 13 or 17 years. Mario Markus, a physicist from the Max Planck Institute for Molecular Physiology in Germany explains that mutations of Cicadas in prime number of years keep them safe from predators like the Cicada Killer Wasp.



Cryptography is a much talked about term in and out of the computing arena. Sending secret messages that cannot be deciphered by an intruder must sound thrilling to many, and is particularly useful when the message needs to be protected. Most of us are aware of the fact that WhatsApp uses end-to-end encryption. The much powerful public-key encryption algorithm RSA (Rivest-Adleman-Shamir) uses a public-key cryptosystem based on asymmetric keys public key for encryption and private key for decryption. RSA derives its resilience from primes. This is because multiplying two very large primes P and Q results in a number N that is very hard to be prime factorized. Writing a computer program to break down the product N into P and Q would result in a collection of overly computer-intensive instructions that would take massive time durations, thereby making it very difficult for a prospective cipher cracker to decode N. It cannot be denied though, that quantum computers, if targeted to break any public-key N down into its prime factors P and Q, could potentially turn RSA into a not so safe haven. That, however, is relatively far in time. RSA has a myriad of applications, from encrypting protected documents to e-banking, e-commerce, MasterCard, digital signatures; we shall stop at that many for now.

The essence of this article, however, is on how to find successive primes. Given the fact that there is no discernible trend that primes follow (or do they, who knows?), how do we generate the prime number Q after a given prime P? People have rote-learned a handful of primes but that is in no way enough to generate public keys for RSA. Computer programs generate large successive primes using the Sieve of Eratosthenes, which, however is very space-intensive due to the nature of the algorithm. Let me introduce to you an alternative way to find primes without having to write the entire range of numbers and cut out composites as in the elementary Sieve method.

Let us say you and your friend play a game, wherein you give him/her a prime number, P and he/she has to find the next prime number Q without using any references. A very simple yet effective method is as follows:

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- 1. Find all integer divisors of P, from 2 toP2. For example, if P=11, the set of divisors D would range from 2 to112, i.e. D = {2,3,4,5}. P being a prime will obviously not be divisible by any value in D, so for each D in the set, find what number when added to P will make it divisible by D. Call this the slack and create a set S to store slack values for each divisor, D.
- 2. There you go! We are one step away from finding the next prime. Trace the smallest even number, E missing in S. Add E to P, and you have Q.

The following table demonstrates the method, and you can try the same to find any prime number (> 5) of your choice.

• Example $P_n = 11$, find P_{n+1} .

Table 1. Method to find the prime number after 11.

Divisor	Remainder	Slack = Divisor – Remainder
2	11%2=1	1
3	11%3=2	1
4	11%4=3	1
5	11%5=1	4

• Now, from the list of slacks, the first missing even number is

• .Thus, next prime number Pn+1 = Pn.

There is much ongoing research to understand prime number patterns, centered mainly on the Twin Prime Conjecture, Riemann Hypothesis, Prime Counting functions and so on. To have fun with primes, we need to begin by acknowledging that primes are a beautiful phenomenon and a mysterious gift of mathematics to the field of computing.

Interested readers can code this method into a computer program and use it to generate very large primes so as to create public-keys that can be fed into RSA for data encryption.

हिंदी विषय और कॅरियर का प्रश्न

डॉ. गोमा दे. शर्मा, असिस्टेंट प्रोफेसर, हिंदी विभाग

जब मैं उच्च माध्यमिक विद्यालय में शिक्षिका थी, कक्षा में हिंदी विषय लेने वाले विद्यार्थियों से अक्सर पूछा करती थी - आप हिंदी क्यों पढ़ना चाहते हैं? एकाध को छोड़कर मुझे अधिकतर बच्चों से एक ही उत्तर मिलता - 'हिंदी में परीक्षा पास करना आसान है, इसलिए।'

स्कूलों में, अन्य शिक्षा संस्थानों या अभिभावकों में हिंदी विषय को लेकर कई भ्रामक स्थितियाँ देखने को मिलती हैं। कई अविभावक और छात्र स्वयं अक्सर यह कह देते हैं -'मैम हिंदी पढ़कर क्या करें?' जो लोग इस प्रश्न को अंतिम मानकर हिंदी के प्रति उदासीनता दिखाते हैं, उनकी शंकाओं का निवारण करना इस लेख का मुख्य उद्देश्य है। भले किसी भी विषय में अपना कॅरियर बनाएँ पर हिंदी को इतनी नीची नज़र से न देखें। जिन्हें लगता है कि हिंदी भाषा-साहित्य की पढ़ाई से जीवन में कुछ हासिल होने वाला नहीं है, हिंदी किसी कॅरियर का द्वार नहीं खोल सकती, हिंदी से आजीविका नहीं कमाई जा सकती - उनसे सादर निवेदन है कि वे इस लेख को आद्यांत अवश्य पढ़ें।

यब बात सत्य है कि हिंदी में डिग्री लेकर विभिन्न क्षेत्रों में कॅरियर बनाया जा सकता है। इसके लिए जरूरी है कि हम पूरी इमान्दारी के साथ हिंदी में अपनी डिग्री हासिल करें। यदि हमने हिंदी में वाचन, लेखन, रचनात्मकता, वार्तालाप करने की दक्षता के साथ उचित डिग्री हासिल की है, तो हमें निराश होने की जरूरत नहीं है। यहाँ मैं कुछ चुनिंदा क्षेत्रों का उल्लेख करना चाहूँगी जिनमें हिंदी डिग्रीधारी अपना भाग्य परख सकते हैं-



हिंदी शिक्षण

भारत के प्राय: सभी निजी एवं सरकारी स्कूल, कॉलेज एवं विश्वविद्यालयों में हिंदी विषय पढ़ाई जाती है। एक हिंदी का अच्छा जानकार, जिसके पास उपयुक्त शैक्षणिक योग्यता हो, वह अपना भाग्य इस क्षेत्र में आज़मा सकता है। सरकारी नौकरी प्राप्त करना हर किसी का सपना होता है। पढ़ाई के बाद अधिकतर लोग सरकारी नौकरी करना चाहते हैं। आप हिंदी साहित्य में आवश्यक योग्यता तथा शिक्षक के लिए तालिम प्राप्त करने बाद केन्द्र व राज्य के विभिन्न शिक्षण संस्थानों में सरकारी शिक्षक के लिए आवेदन कर सकते हैं।

हिंदी अधिकारी (हिंदी ऑफिसर) -

राजभाषा विभाग विभिन्न सरकारी मंत्रालयों, संस्थानों आदि के लिए हिंदी अधिकारियों को नियुक्ति देती है। आप हिंदी की योग्यता के साथ सरकारी संस्थानों और मंत्रालयों में राजभाषा अधिकारी पद के उम्मीद्वार के तौर पर अपनी किस्मत आज़मा सकते हैं।

हिंदी पत्रकारिता

वर्तमान समय में पत्रकारिता अच्छी-खासी कॅरियर के क्षेत्र के रूप में उभर रही है। आज हिंदी समाचारपत्र, टेलिविजन न्यूज चैनल्स (सरकारी या निजी) हिंदी में खबर प्रसारण के क्षेत्र में अपनी धाक जमा रहे हैं। यहाँ तक कि इन्टरनेट के आगमन के साथ-साथ सेटेलाइट चैनलों की बाढ़ भी इस दौर में देखी जा रही है। जितने न्यूज चैनल्स अस्तित्व में आ रहे हैं उतने ही ये हिंदी पत्रकारिता में योग्यता हासिल करने वाले उम्मीदवारों के लिए नौकरी के बेहतरीन प्लेटफॉर्म भी तैयार कर रहे हैं। इस क्षेत्र में आप न्यूज एंकर, न्यूज एडिटर, न्यूज राइटर, रिपोर्टर, फोटो पत्रकार, फ्रीलांसर पत्रकार आदि बन सकते हैं। इसके लिए आपको हिंदी पत्रकारिता में योग्यता प्राप्त करनी होगी। सुधीर चौधरी, अर्नब गोस्वामी, रजत शर्मा, श्वेता सिंह, निधि राजदान, अंजना ओम कश्यप आदि टीवी पत्रकारिता जगत की वो हस्तियाँ हैं जिनकी सालाना आय करोड़ों में है।

हिंदी कॉपी राइटिंग

हेंदी में शैक्षणिक योग्यता हासिल करने वाले कॉपी राइटिंग के क्षेत्र को अपनी आजीविका के रूप में चुन सकते हैं। आज के समय मे कॉपी राइटर के लिए टेलीविजन इंडस्ट्री, फिल्म इंडस्ट्री, एडवरटाइजिंग इंडस्ट्री, रेडियो आदि में काफी अच्छे अवसर हैं। यहाँ पर आप स्क्रिप्ट लेखक के तौर पर नौकरी कर सकते हैं। इसके अलावा हिंदी न्यूज़ पेपर और टीवी न्यूज चैनल्स, पत्र-पत्रिकाओं में आप हिंदी स्तंभ लेखक, संपादक, हिंदी कंटेंट राइटर के रूप में भी अपनी अच्छी आजीविका कमा सकते हैं। हिंदी साहित्य में डिग्री लेने वाले यदि लेखन में अच्छे हैं, तो वे किसी ऑनलाइन हिंदी वेबसाइट के लिए भी घर बैठे-बैठे लिख सकते हैं और पैसे कमा सकते हैं।

डिजिटल मीडिया

वर्तमान में हिंदी डिग्रीधारियों के लिए डिजिटल मीडिया और सोशल मीडिया के क्षेत्र में भी हिंदी कंटेंट राइटर के रुप अच्छे कॅरियर के अवसर हैं। यदि आपको हिंदी भाषा का अच्छा ज्ञान है और आपकी संचार और प्रस्तुति कौशल (Communication and presentation skill) उम्दा है तो आप मीडिया के क्षेत्र में न्यूज़ एंकर, न्यूज़ रीडर, न्यूज एडिटर के तौर पर कॅरियर बनाकर उच्च वेतन का लाभ उठा सकते हैं। आजकल लगभग सभी मीडिया संस्थान चाहें वो न्यूज़ चैनल्स हों या न्यूज़ पेपर हों इन सभी के वेब पोर्टल चल रहे हैं, आप यहाँ पर भी जॉब कर सकते हैं।

ट्रांसलेटर और इंटरप्रिटर

, आजकल विभिन्न संस्थानों में अनुवादक तथा इंटरप्रिटर (दुभाषिया) की जरूरत पड़ती है। इनका काम अंग्रेजी या अन्य भाषाओं के आर्टिकल्स को हिंदी में अनुवाद करना होता है। अनुवाद करने वाले को अनुवादक या ट्रांसलेटर कहते हैं और मौखिक भाषा को दूसरी भाषा में समान अर्थ में तत्काल अनुवाद करके बोलने वाले को दुभाषिया या इंटरप्रिटर कहते हैं। मीडिया क्षेत्र तथा ट्रांसलेशन कंपनियों में अच्छे ट्रांसलेटर एवं इंटरप्रिटर की काफी माँग रहती है। इसके अलावा आप फ्रीलांसिंग के क्षेत्र में भी ट्रांसलेटर के तौर पर काम कर सकते हैं। जहाँ पर आपको ट्रांसलेशन में शब्द-शब्द के लिए भुगतान किया जाता हैं। यह कार्य ऑनलाइन भी उपलब्ध होता है। कई ट्रांलेशन कंपनियाँ ऑनलाइन ट्रांलेशन जॉब प्रदान करती हैं। इसके लिए आपको दो भाषाओं का अच्छा ज्ञाता होना जरूरी है।

स्क्रीन राइटिंग

फिल्म जगत और दूरदर्शन के क्षेत्र में हिंदी भाषा-साहित्य के अच्छे जानकारों की खासी माँग रहती है। आज के समय में ओटीटी प्लेटफार्म के अस्तित्व में आने से इस क्षेत्र के हिंदी कॅरियर का स्कोप भी बढ़ गया है। अगर आप हिंदी में अच्छे हैं, तो आप प्रोडक्शन हाउस, मीडिया हाउस आदि में स्क्रिप्ट राइटिंग, डायलॉग्स या लिरिक्स भी लिख सकते हैं। अगर आप स्क्रीन राइटर बनना चाहते हैं तो आपको हिंदी में बी.ए करने के बाद स्क्रीन राइटिंग कोर्स में पोस्ट ग्रेजुएशन करनी होगी ताकि आपके भीतर लेखन की अच्छी समझ विकसित हो सके।



वॉइस असिस्टेंट (Voice Assistant)

दुनिया में तकनिकी विकास के साथ-साथ इन्हें चलाने, इनका क्षेत्र विस्तार करने या इन्हें दूसरे देशों में बिक्री करने के लिए उस देश के वासियों को समझ में आने वाली भाषा में इनकी खासियत समझाने की जरूरत भी बढ़ गई है। इसके लिए वॉइस असिस्टेंट की आवश्यकता बढ़ रही है। कंपनियाँ आबादी के हिसाब से उस क्षेत्र की प्रमुख भाषा में इन्हें रेकॉर्ड करती हैं। भारत में हिंदी ही अधिक बोली और समझी जाती है, इसलिए इस भाषा में वॉइस असिस्टेंट की ज्यादा जरूरत पड़ती दिखाई दे रही है। विशेष रूप से टेलेसिस (नियोजित सामाजिक विकास) और ग्राहक सेवा जैसे क्षेत्रों में हिंदी भाषी पेशेवरों के लिए कॉल सेंटर, कस्टमर केयर सर्विसेज़, सेल्स टेलीमार्केटिंग और बीपीओ के साथ नौकरी के अवसर उपलब्ध हैं। इसके लिए आपके पास उत्कृष्ट संचार कौशल होना अनिवार्य होता है।

भाषण लेखन

राजनेता, जननेता या किसी संस्था का हेड भाषण के द्वारा व्यावहारिक रूप से भीड़ को प्रभावित करना चाहता है। इसके लिए उसे उम्दा भाषण लेखक की आवश्यकता पड़ती है। जैसे ही भाषणों और जनसंपर्क का महत्व बढ़ता है, भाषण लेखकों की अधिक माँग होती है। भारत में जनता का एक बड़ा हिस्सा हिंदी भाषी है, इसलिए भाषण देने के लिए हिंदी एक लोकप्रिय भाषा बन गई है, जिसके चलते यह भाषण लेखकों की माँग की ओर अग्रसर है। हिंदी भाषा में पकड़ रखने वाले इस क्षेत्र में अपना भाग्य आज़मा सकते हैं।

इसके अलावा आप विभिन्न समाज-सेवी संगठन या गैर-सरकारी संस्थाओं (NGOs) में लोगों से प्रभावी संपर्क बनाने के लिए अक्सर हिंदी विशेषज्ञों को सामाजिक कार्य की अहम जिम्मेदारी सौंपी जाती है, तो आप यहाँ पर भी जॉब के अवसर पा सकते हैं। आप कवि/ कथाकार/ उपन्यासकार/ नाटककार के तौर पर अपने आपको स्थापित कर नाम और दाम दोनों कमा सकते हैं। आज विश्वग्राम बनी इस दुनिया में बाजारवाद हर दिन नए नए

इस तरह से हिंदी भाषा में कॅरियर की बहत संभावनाएँ हैं। भौगोलीकरण या बढते बाजारवाद ने ने इसके लिए कई नए द्वार खोल दिए हैं। विश्व के बडे- बडे उद्योगपति भारत में अपने उद्योग का विस्तार कर रहे हैं या भारत में बाजार तलाश रहे हैं। इन उद्योगों में काम करने वाले लोगों को हिंदी का ज्ञान होना जरूरी है। इनमें भी हिंदी के जानकारों के लिए जॉब के अवसर उपलब्ध हो रहे हैं। एक अहम् बात है कि हिंदी में यदि काम करना हो तो हिंदी का कागजी नहीं व्यवहारिक ज्ञान आवश्यक होता है। अब आप शायद यह भी कह सकते हैं कि उसने बी.ए हिंदी या एम.ए. हिंदी कर रखा है उसको जॉब नहीं मिल रही, तो इसके लिए हम आपको बता दें उन लोगों के पीस हिंदी की सही जानकारी या हिंदी में वांछित कौशल प्राप्त नहीं है। सबसे पहले आप हिंदी की संभावनाओं को पहचानें। इसके बाद जिस क्षेत्र में जाना चाहें, उसके हिसाब से अपने अंदर अपने कौशलों का विकास करें। एक बात ज़रूर ध्यान में रखें कि आजकल हर क्षेत्र में प्रतिस्पर्धा है। हर क्षेत्र में उन्हीं को अवसर मिलते हैं जिनकी अपने विषय में गहरी जानकारी हो। इसलिए हिंदी के विभिन्न क्षेत्रों में आजीविका तलाशने के इच्छक युवा पीढी को आवश्यक है कि स्वयं को इन क्षेत्रों में प्रतिस्पर्धों के काबिल जरूर बनाएँ।

संख्याओं के संसार में भटकते हुए एक खूबसूरत सफर

कुमार मेहता, मिस्टेंट गोफेसर, दिंटी विभ

असिस्टेंट प्रोफेसर, हिंदी विभाग

तबीतय कुछ नासाज थी। हल्का बुखार, बदन दर्द और उस पर लगातार आ रही झींकों ने हालत खराब कर रखी थी। सोचा कि दवाई खाकर कुछ देर लेट लूं। लेटा भी, लेकिन नींद का तो दूर-दूर तक कुछ अता-पता ही नहीं था क्यूंकि दिमाग उलझा हुआ था एक सवाल में कि

$$S = 1 + \frac{1}{3} + \frac{1}{6} + \frac{1}{10} + 1$$

का हल क्या होगा?

मेरे एक शिक्षक प्रोफेसर मलिक ने गणित के अलग-अलग क्षेत्रों की कुछ लोकप्रिय पहेलियों व सवालों को इकठ्ठा कर एक किताब लिखी है। ये भी उन्हीं सवालों में से एक था। एक और बात जो इस सवाल को खास बनाती है वो ये कि यह वही सवाल है जो Huygens ने युवा Leibnitz से उस समय पूछा था जब Leibnitz उनके पास गणित के गुर सीखने की इच्छा से गये थे। आप चाहें तो आगे पढ़ने से पहले इस सवाल को हल करने की कोशिश कर सकते हैं। क्या पता आपकी इस कोशिश में कोई नया तरीका ही निकल आये इसे हल करने का।

Huygens औरLeibnitz तो नहीं रहे, लेकिन उनसे जुड़ा यह सवाल मेरे शिक्षक के चलते मेरे सामने था और मैं कोशिश कर रहा था इसे हल करने की। इसे हल करने की प्रक्रिया में पहला सवाल जो मेरे सामने था कि इस संख्या श्रेणी (number series) का अगला मतलब कि पांचवा पद क्या होगा? साफ जाहिर था कि इस सवाल का जवाब भी दिये गये चार पदों से ही मिलने वाला था, क्यूंकि इसके अलावा तो और कोई जानकारी थी नहीं। मुझे दिखाई दिया कि दिये गये चार पदों में से हर पद में अंश तो समान है (1 के बराबर है) और बदलाव सिर्फ हर की संख्या में आ रहा है। तो मैंने अपनी कापी में दिये गये पदों की हर की संख्याओं को कुछ इस तरह से लिखा:\



पद	हर क सं⊺
1	1
2	3
3	6
4	10
5	?
6	?
X	\boxtimes

कुछ देर इसे निहारने के बाद मुझे दिखाई दिया कि पहली संख्या तो 1 है और दूसरी संख्या पहली संख्या में 2 जोड़ने से मिली है और तीसरी संख्या दूसरी संख्या में 3 जोड़ने से। इस नियम को माने तो चौथी संख्या तीसरी संख्या में 4 जोड़ने से मिलनी चाहिये और ये बात एकदम सही बैठती है क्यूंकि तीसरी संख्या है 6 और चौथी संख्या निकालने के लिये इसमें 4 जोड़े तो हमें 10 मिलेगा जो कि दिये गये सवाल की भी चौथी संख्या थी। मुझे लगा जिस नियम की तलाश थी वो मुझे मिल गया। जिस पद की हर की संख्या चाहिये, उसके पिछली वाले पद की हर की संख्या में चाहे

गये पद का नंबर जोड़ना होगा, बस हो गया काम। उदाहरण के तौर पर अगर दसवें पद की हर की संख्या चाहिये तो नौवें पद की हर की संख्या में 10 जोड़ दो। लेकिन फिर मुझे एहसास हुआ कि यह नियम मुझे इतना तो बतला देता है कि फलां पद के हर की संख्या कैसे निकलेगी, लेकिन वो संख्या क्या होगी इसकी सीधी जानकारी नहीं देता। अब दसवें पद की हर की संख्या के लिये नौवें पद की हर की संख्या पता होनी चाहिये। उसी तरह नौवें पद की हर की संख्या के लिये आंठवे पद की हर की संख्या। आठवे के लिये सातवें, सातवें के लिये छठे करते-करते तो हम फिर पहले पद तक पहुंच जायेंगे। नियम कुछ ऐसा हो कि ना केवल ये बताए कि अगली संख्या कैसे निकलेगी बल्कि यह भी बतलाए कि संख्या क्या होगी।

मैंने एक दफे फिर से पदों की हर की संख्याओं को पिछले हर की संख्या और पद के नंबर के जोड़ के रूप में लिखा, बस इस दफे पिछली हर की संख्या को उसके घटकों के योग के रूप में कुछ इस तरह: मैंने एक दफे फिर से पदों की हर की संख्याओं को पिछले हर की संख्या और पद के नंबर के जोड़ के रूप में लिखा, बस इस दफे पिछली हर की संख्या को उसके घटकों के योग के रूप में कुछ इस तरह:

पद	हर क सं⊺ प	छला नयम	नया नयम
1	1	1	1
2	3	1+2	1+2
3	6	3+3	1 2 +3 ∞ ∞ ∞ ∞ ∞ ∞
4	10	6+4	1 8 8 0 000 00 00 00 00 00 00 00 00 00 00
5	15	10+5	1 + 4 + 5 8 8 8 800 80 80
6	21	15+6	1 1 2 4 3 1 4 + 5 + 6
	\boxtimes	\boxtimes	
n			1-2

अबकी बार नियम एकदम साफ था। श्रेणी के पांचवे पद का हर होगा 1+2+3+4+5, यानी कि 1 से की सभी संख्याओं का योग। इसी तरह दसवें पद का हर -1 से लेकर 10 तक की सभी संख्याओं का योग; सौवें पद का हर होगा -1 से लेकर 100 तक की सभी संख्याओं का योग। इस तरह एक सामान्य नियम बनेगा कि n-वें पद का हर होगा -1 से लेकर संख्या n तक की सभी संख्याओं का योग। मैंने कभी गणितज्ञ Gauss से जुड़ी एक कहानी सुनी थी, जिसमें उन्होंने 1 से लेकर संख्या n तक की सभी संख्याओं के योग का एक सीधा-सरल सूत्र सुझाया था। इस सूत्र के मुताबिक 1 से लेकर संख्या *n* तक की सभी संख्याओं का योग $\frac{n(n+1)}{2}$ के बराबर होता है। मैंने झट से इस सूत्र के इस्तेमाल से श्रेणी के शुरुआती पद निकालकर देख लिये और संतुष्ट हो गया कि

श्रेणी के n-वें पद का हर होगा $-\frac{n \times (n+1)}{2}$ के बराबर। इस तरह श्रेणी का n-वां पद होगा $\frac{1}{\frac{n(n+1)}{2}}$.



हर क सं⊺ पद $\frac{n \times (n+1)}{2}$ (n) 1 $\frac{1 \times (1+1)}{2} = 1$ $\frac{2 \times (2+1)}{2} = 3$ 2 3 $\frac{3\times(3+1)}{2}=6$ 4 $\frac{4 \times (4+1)}{2} = 10$ $\frac{5\times(5+1)}{2}$ = 15 5 X X

इस तरह श्रेणी $1 + \frac{1}{3} + \frac{1}{6} + \frac{1}{10} + \square$ को बढ़ाकर मैंने कुछ इस तरह लिख लिया: $S = 1 + \frac{1}{3} + \frac{1}{6} + \frac{1}{10} + \frac{1}{15} + \frac{1}{21} + \frac{1}{28} + \frac{1}{36} + \frac{1}{45} + \square + \frac{2}{p} + \frac{2}{p} + \frac{2}{(p+1)} + \frac{2}{(p+1)} + \square$

पर यह तो बस प्रक्रिया की शुरूआत भर थी जिसमें मुझे इन अनगिनत पदों का योग 'S' निकालना था। पहाड़ तोड़ने जैसे इस काम को मैंने टुकड़ों-टुकड़ों में करने का मन बनाया। मैंने सोचा कि मैं पहले दो, फिर अगले दो, फिर उसके अगले दो, करते हुए दो-दो पदों का योग करता हूं। शायद कुछ पैटर्न उभर आये।

$$S = \left(1 + \frac{1}{3}\right) + \left(\frac{1}{6} + \frac{1}{10}\right) + \left(\frac{1}{15} + \frac{1}{21}\right) + \left(\frac{1}{28} + \frac{1}{36}\right) + \mathbb{N} + \left(\frac{2}{\left(1 + \frac{1}{3}\right)} + \frac{2}{\left(1 + \frac{1}{3}\right)} + \frac{1}{2}\left(\frac{1}{3} + \frac{1}{5}\right) + \frac{1}{3}\left(\frac{1}{5} + \frac{1}{7}\right) + \frac{1}{4}\left(\frac{1}{7} + \frac{1}{9}\right) + \mathbb{N} + \frac{2}{(n+1)}\left(\frac{1}{n} + \frac{1}{(n+2)}\right) + \mathbb{N}$$


मुझे कुछ पैटर्न उभरता लगा तो मैं आगे बढ़ा:

$$S = \left(\frac{4}{1\times3}\right) + \frac{1}{2}\left(\frac{8}{3\times5}\right) + \frac{1}{3}\left(\frac{12}{5\times7}\right) + \frac{1}{4}\left(\frac{16}{7\times9}\right) + \square$$
$$= \left(\frac{4}{1\times3}\right) + \left(\frac{4}{3\times5}\right) + \left(\frac{4}{5\times7}\right) + \left(\frac{4}{7\times9}\right) + \square$$
$$= 4\left(\frac{1}{1\times3} + \frac{1}{3\times5} + \frac{1}{5\times7} + \frac{1}{7\times9} + \square\right)$$

पैटर्न मुझे सुंदर लगा तो मैंने उसे बढ़ाकर कुछ यूं लिख लिया:

$$S = 4\left(\frac{1}{1\times3} + \frac{1}{3\times5} + \frac{1}{5\times7} + \frac{1}{7\times9} + \frac{1}{9\times11} + \frac{1}{11\times13} + \frac{1}{13\times15} + \frac{1}{15\times17} + \mathbb{N}\right)$$

मैंने दोबारा से इस मौजूदा श्रेणी के दो-दो पदों को जोड़ने का सोचा

$$S = 4\left\{ \left(\frac{1}{1 \times 3} + \frac{1}{3 \times 5}\right) + \left(\frac{1}{5 \times 7} + \frac{1}{7 \times 9}\right) + \left(\frac{1}{9 \times 11} + \frac{1}{11 \times 13}\right) + \left(\frac{1}{13 \times 15} + \frac{1}{15 \times 17}\right) + \mathbb{N} \right\}$$
$$= 4\left\{ \frac{1}{3}\left(\frac{1}{1} + \frac{1}{5}\right) + \frac{1}{7}\left(\frac{1}{5} + \frac{1}{9}\right) + \frac{1}{11}\left(\frac{1}{9} + \frac{1}{13}\right) + \frac{1}{15}\left(\frac{1}{13} + \frac{1}{17}\right) + \mathbb{N} \right\}$$

मैंने मौजूदा श्रेणी के दो-दो पदों को जोड़ने का वही तरीका तीसरी और फिर चौथी दफे अपनाया तो मुझे 'S' के ये तमाम पैटर्न मिले:

$$S = 4 \left\{ \frac{1}{1 \times 3} + \frac{1}{3 \times 5} + \frac{1}{5 \times 7} + \frac{1}{7 \times 9} + \mathbb{N} \right\}$$

$$S = 8 \left\{ \frac{1}{1 \times 5} + \frac{1}{5 \times 9} + \frac{1}{9 \times 13} + \frac{1}{13 \times 17} + \mathbb{N} \right\}$$

$$S = 16 \left\{ \frac{1}{1 \times 9} + \frac{1}{9 \times 17} + \frac{1}{17 \times 25} + \frac{1}{25 \times 33} + \mathbb{N} \right\}$$

$$S = 32 \left\{ \frac{1}{1 \times 17} + \frac{1}{17 \times 33} + \frac{1}{33 \times 49} + \frac{1}{49 \times 65} + \mathbb{N} \right\}$$



ये पैटर्न देखने में खूबसूरत तो थे लेकिन ये सभी बस उसी सवाल के अलग-अलग रूप भर थे जिसके साथ मैंने शुरुआत की थी यानी कि

 $S = 1 + \frac{1}{3} + \frac{1}{6} + \frac{1}{10} + \frac{1}{15} + \frac{1}{21} + \frac{1}{28} + \frac{1}{36} + \frac{1}{45} + \mathbb{X} + \frac{2}{n \times (n+1)} + \frac{2}{(n+1) \times (n+2)} + \mathbb{X}$

मेरे दिमाग में ख्याल आया कि पहाड़ तो अब भी जस का तस ही बना हुआ है। हां ये बात और है कि मैं एक चक्कर लगाकर उसे तमाम अलग-अलग दिशाओं से देख आया हूं, उसकी खूबसूरती को निहार आया हूं। मुझे एहसास हुआ कि मेरा पिछला तरीका तो मुझे हल की तरफ नहीं लेकर जा रहा इसलिये कोई नई ज़ुगत भिड़ानी होगी।

मैं फिर शुरूआत पर पहुंच गया। श्रेणी के पदों को टुकड़ों-टुकड़ों में जोड़ने के अलावा और कोई तरीका सूझ नहीं रहा था। पर जाने क्यूं इस दफे दिमाग में एक ख्याल आया कि अबकी बार श्रेणी की पहली संख्या को छोड़ कर बाकी पदों के जोड़े बनाकर उन्हें जोड़ा जाये। मैं आगे बढ़ा। कुछ इस तरह,

$$S = 1 + \left(\frac{1}{3} + \frac{1}{6}\right) + \left(\frac{1}{10} + \frac{1}{15}\right) + \left(\frac{1}{21} + \frac{1}{28}\right) + \left(\frac{1}{36} + \frac{1}{45}\right) + \mathbb{N}$$

$$= 1 + \frac{1}{3}\left(\frac{1}{1} + \frac{1}{2}\right) + \frac{1}{5}\left(\frac{1}{2} + \frac{1}{3}\right) + \frac{1}{7}\left(\frac{1}{3} + \frac{1}{4}\right) + \frac{1}{9}\left(\frac{1}{4} + \frac{1}{5}\right) + \mathbb{N}$$

$$= 1 + \frac{1}{3}\left(\frac{3}{2}\right) + \frac{1}{5}\left(\frac{5}{6}\right) + \frac{1}{7}\left(\frac{7}{12}\right) + \frac{1}{9}\left(\frac{9}{20}\right) + \mathbb{N}$$

$$= 1 + \frac{1}{2} + \frac{1}{6} + \frac{1}{12} + \frac{1}{20} + \mathbb{N}$$

आखिरी चरण तक पहुंचते-पहुंचते मेरी आंखों में चमक आ गई। बदन दर्द, बुखार दोनों गायब से हो गये। मुझे हल दिखाई देने लगा। इस बार का तरीका काम कर गया। पहाड़ ढ़ह चुका था। मुझे आखिरी चरण मिला -

$$S = 1 + \frac{1}{2} + \frac{1}{6} + \frac{1}{12} + \frac{1}{20} + \boxtimes$$

ध्यान दीजिये कोष्ठक के अंदर आने वाली श्रेणी वही श्रेणी है जिसका हमें हल निकालना है। चूंकि ये योग अनगिनत पदों का है इसलिये हम कोष्ठक की श्रेणी भी S को ही दर्शाएगी। इस तरह मुझे मिला

$$S = 1 + \frac{1}{2}S$$



जिससे हम आसानी से देख सकते हैं कि *S* = 2 होगा। मैंने अपने शिक्षक की किताब में सुझाया हल देखा। मेरा उत्तर तो सही था लेकिन उनका हल निकालने का तरीका मेरे तरीके से अलग था। लेकिन बात सिर्फ इतनी होती तो शायद मैं ये लेख ना लिखता। संख्याओं के संसार में मेरा असली सफर तो ये हल निकालने के बाद शुरु हुआ। मुझे लगा कि *S* = 2 अगर है तो उन खूबसूरत पैटर्नों का क्या जो मुझे मेरे पहले अपनाये तरीके से मिले थे।

$$S = 4 \left\{ \frac{1}{1 \times 3} + \frac{1}{3 \times 5} + \frac{1}{5 \times 7} + \frac{1}{7 \times 9} + \mathbb{N} \right\}$$

$$S = 8 \left\{ \frac{1}{1 \times 5} + \frac{1}{5 \times 9} + \frac{1}{9 \times 13} + \frac{1}{13 \times 17} + \mathbb{N} \right\}$$

$$S = 16 \left\{ \frac{1}{1 \times 9} + \frac{1}{9 \times 17} + \frac{1}{17 \times 25} + \frac{1}{25 \times 33} + \mathbb{N} \right\}$$

$$S = 32 \left\{ \frac{1}{1 \times 17} + \frac{1}{17 \times 33} + \frac{1}{33 \times 49} + \frac{1}{49 \times 65} + \mathbb{N} \right\}$$

यानी कि वो सारे और उन जैसे तमाम पैटर्न जो मुझे तब मिलते अगर मैं अपने पहले तरीके की प्रक्रिया को लगातार दोहराता जाता। मैंने इन सारे पैटर्न में S का मान रखकर देखा। मुझे जो श्रेणियां मिली वो कुछ ऐसी थीं -

$$\frac{1}{2} = \frac{1}{1 \times 3} + \frac{1}{3 \times 5} + \frac{1}{5 \times 7} + \frac{1}{7 \times 9} + \square$$
$$\frac{1}{4} = \frac{1}{1 \times 5} + \frac{1}{5 \times 9} + \frac{1}{9 \times 13} + \frac{1}{13 \times 17} + \square$$
$$\frac{1}{8} = \frac{1}{1 \times 9} + \frac{1}{9 \times 17} + \frac{1}{17 \times 25} + \frac{1}{25 \times 33} + \square$$
$$\frac{1}{16} = \frac{1}{1 \times 17} + \frac{1}{17 \times 33} + \frac{1}{33 \times 49} + \frac{1}{49 \times 65} + \square$$

मुझे संख्याओं, $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{8}$, $\frac{1}{16}$, a का ऐसा स्वरूप मिल गया था जिसमें उन्हें अनगिनत पदों के योग

के रूप में दर्शाया जा सकता था। और ना केवल इन संख्याओं को बल्कि अब मैं उन संख्याओं को भी अनगिनत पदों के योग के रूप में दर्शा सकता था जो मुझे अपने पहले तरीके की प्रक्रिया को लगातार

दोहराने से मिलती यानी कि
$$\frac{1}{32}, \frac{1}{64}, \frac{1}{128}, ^{\square}$$
 ।

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1/32 को अनगिनत पदों के योग के रूप में मैं कुछ इस तरह लिख सकता था:

$$\frac{1}{32} = \frac{1}{1 \times 33} + \frac{1}{33 \times 65} + \frac{1}{65 \times 97} + \frac{1}{97 \times 129} + \mathbb{Z}$$

ठीक इसी तरह $\frac{1}{64}$, $\frac{1}{128}$, a अन्य ऐसी संख्याओं को। $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{8}$, $\frac{1}{16}$, $\frac{1}{32}$, $\frac{1}{64}$, $\frac{1}{128}$, k संख्याओं में एक समानता है कि हर अगली संख्या पिछली संख्या में $\frac{1}{2}$ का गुणा करने से मिलती है। यानी कि इन संख्याओं के हर 2^n के बराबर हैं, जहां n का मानहोगा। मुझे लगा कि इन पैटर्नों में एक सामान्य नियम छिपा हुआ है जिस किसी संख्या p के लिये कुछ इस तरह लिखा जा सकता है:

$$\frac{1}{p} = \frac{1}{1 \times (p+1)} + \frac{1}{(p+1) \times (2p+1)} + \frac{1}{(2p+1) \times (3p+1)} + \frac{1}{(3p+1) \times (4p+1)} + \boxtimes$$

अब मेरे सामने यह प्रश्न था कि क्या यह सामान्य नियम सिर्फ उन संख्याओं पर ही लागू होता है जिनके लिये *p* = 2^{*n*} , जहां n का मानहो 1,2,3,4,5,6,7[∞] या ये नियम n के किसी भी मान के लिये लागू होता है। मिसाल के तौर पर क्या यह नियम *n* = *π* या *n* = √2 के लिये सही होगा? मुझे ऐसा लगता तो है कि ये नियम n के सभी मानों के लिये लागू होना चाहिये, लेकिन मैं अभी इसे सिद्ध नहीं कर पाया हूं। आप चाहें तो आप भी हाथ आजमा सकते हैं। मुझे यकीन है हमारे पहले भी किसी ना किसी ने इस नियम को जरूर ढूंढ निकाला होगा और शायद इसे सिद्ध भी किया होगा। लेकिन अपने आप इसे सिद्ध कर पाने का मजा ही कुछ और होगा।

वैसे जरा इस सामान्य नियम में n = -1 या नी $p = 2^{-1} = \frac{1}{2}$ किरखकर देखिए तो क्या मिलता है। संख्याओं के साथ थोड़ा खेलकर आप वहीं पहुंच जायेंगे जहां से ये लेख शुरू हुआ था। इस सवाल को हल करने की प्रक्रिया की शुरुआत में हालांकि मैं थोड़ा भटका लेकिन वो भटकाव ही मुझे एक सामान्य नियम तक लेकर आया। मुझे वो लाईने याद आ गई जो कभी शायद भटकते हुए ही मुझसे लिखा गई थी कि

अच्छा है भटकाव भी वो ज्ञान दिशा का देता है।

Mental Health and Human Emotion Recognition: An Intelligent Signal Processing Perspective

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Mental health is the manifestation of the harmonious relationships amongst emotional, psychological, and social well-being of an individual. It affects our thoughts, feelings, and behaviors, which in turn help manage stress, build social relationships, and make decisions. In short, we can cope with the life challenges better, give our hundred percent potential, and enjoy life when we are in a positive state of mental health [1]. According to the world health organization (WHO), depression, anxiety disorders are main factors contributing to psychological disability globally. It is estimated that 1 out 3 women and 1 out of 5 men may suffer from serious depression in some point in their lives. These conditions can significantly impact an individual's quality of life, relationships, and overall well-being [2-5]. Beyond depression and anxiety, other common mental health disorders include bipolar disorder, schizophrenia, and obsessive-compulsive disorders that can significantly impact our lives. Mental health management is a serious issue in higher educational institutions (HEIs), particularly amongst the young generation, and all age groups in general. There is a growing trend in anxiety, depression, eating disorders, substance use, and suicidal ideation among students in HEIs.



For effective treatment and improving mental health condition, early detection and expert's intervention is essential. However, stigma, ignorance, and restricted access to mental health treatments frequently prevent people from getting the care they need. It is essential to promote mental health awareness, reduce stigma, and provide accessible and affordable mental healthcare services to address this growing crisis in our society.

Traditional approaches to mental health assessment and treatment frequently depend on self-reported measures or clinical interviews, which can be subjective and time intensive. Recently, there has been an increasing demand for using artificial intelligence (AI) driven noninvasive signal processing techniques a collection of body signals- electroencephalogram (EEG), involving electrocardiogram galvanic skin (ECG). response (GSR). and photoplethysmography (PPG) and vital signs simultaneously for the early detection of mental health anomalies and thereby providing objective means of evaluating mental health through emotion recognition and analysis.

While machine learning (ML) techniques are very effective in extracting low- and mid-level features for human emotion recognition, they fail to capture high-level features that represent deeper, more abstract relationships present in our body signals. The high-level features are crucial for understanding complex patterns and connections present in muti-modal data, where subtle variations may indicate transition of emotional or mental health states. Deep learning (DL), with its ability to learn hierarchical and domain-invariant representations directly from raw data, overcomes these limitations, making it essential for extracting high-level features in emotion recognition tasks. DL facilitates mental health assessment by processing our body signals to automatically derive hierarchical features representing emotional states. Popular approaches involve convolutional neural networks (CNNs) for spatial feature detection, recurrent neural networks (RNNs) (especially LSTMs) for modeling temporal patterns, and attention mechanisms to emphasize critical data segments, thereby enhancing classification precision and robustness.

The Role of Technology in Mental Health and Emotion Recognition

• Advances in technology, particularly in artificial intelligence and machine learning (AIML), are opening new possibilities for emotion recognition to improve mental health.

AI-driven Mental Health Applications:

• These apps assess a user's emotional state based on physiological signal analysis and provide personalized interventions.

Virtual Therapists:

• AI-powered virtual therapists can offer support and guidance, using emotion recognition to tailor their responses to the user's needs.

Early Detection of Mental Health Issues:

• By analyzing physiological signals, AI can help identify individuals at risk of developing mental health problems.

The Future of Mental Health and Emotion Recognition

• The integration of emotion recognition and mental health care is rapidly advancing, paving the way for innovative technologies that empower individuals to understand and manage their mental well-being effectively.

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Integrating AI in Music: The Harmony of Technology and Creativity

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Music has always been a mirror of human emotion, a language that transcends barriers and speaks to the soul. From the beats of a drum to the symphonies of Beethoven, and now, to the digital soundscapes of the modern era, music has evolved alongside human civilization. But now, a new composer has entered the orchestra: Artificial Intelligence. In the world of music, like the other creative and innovative industries, this new composer i.e., a class of digital tools, commonly known as Generative AI (GenAI) has been introduced that can produce creative contents based on experiences gained from the surrounding media. This high-tech revolution although has been found capable to regenerate most familiar issues in this evolving domain, plenty about it is honestly innovative. Both supervised and unsupervised AI predictive models have already been successfully utilized to analyse vocalist's singing styles, composers' stylometric features, sounds or production aesthetics, and generate excellent work that mirrors their old stuff without their say.

With this successful convergence of Music and modern technology, innovation is helping to rewrite the rules of creativity. At first glance, the idea of AI composing music might seem contradictory. How can a machine, devoid of emotion, create art that moves us? Yet, this collaboration is not about replacing human creativity; it's about amplifying it. Now AI has been successfully utilized in almost every step of a music production cycle. Figure 1 shows the various steps involved in a music production process where AI and ML (Machine Learning) can be successfully utilized.





Fig 1: AI/ML and Its Applications in Music Production Cycle

AI doesn't compose music in isolation—it learns from centuries of human expression. By analysing vast libraries or archives of compositions, AI/ML systems like OpenAI's MuseNet or Google's Magenta can generate original pieces in the style of Bach, jazz, or even modern pop. These creations aren't meant to replace human composers but to inspire them, providing fresh ideas, unexpected combinations, and new directions for exploration. Imagine a songwriter stuck on a melody. With AI, they can experiment with harmonies, rhythms, and structures they might never have considered. This partnership transforms the creative process into a dynamic conversation between human intuition and machine learning. AI can automate time-consuming tasks like mixing, mastering, or generating chord progressions, allowing musicians to focus on creativity. It speeds up the production process, enabling quicker releases of high-quality tracks.

AI also breaks down barriers to music creation. Tools like AIVA (Artificial Intelligence Virtual Artist) or Amper Music allow anyone, regardless of their musical training, to compose and produce high-quality music. This democratization empowers people worldwide to tell their stories through sound, creating a richer, more diverse musical landscape.



AI in music is not about replacing humanity's touch; it's about extending it. It's about exploring the infinite possibilities that arise when we combine the depth of human emotion with the precision of technology. It's about creating a harmony where creativity and innovation play in unison, producing a symphony that's greater than the sum of its parts. So, as we move forward, let us celebrate this collaboration—not as a competition, but as a duet between human ingenuity and artificial intelligence. Together, we can compose the soundtrack of the future.

Yet, as with any innovation, AI in music raises important questions. Who owns a song composed by AI? How do we preserve the authenticity of human expression in an era where machines can mimic it? And most crucially, how do we ensure AI is used ethically and inclusively, fostering creativity rather than stifling it? These are challenges we must confront as we embrace this new chapter in music history. But challenges often lead to growth, and this dialogue can enrich both the art and the technology.

Although we have discussed a good number of pros of AI/ML in music, there are a few prominent cons also.

(a) Loss of Human Touch: A common argument is that music generated using AI/ML lacks the emotional depth and authenticity of human-composed works. Over-reliance on AI might lead to a homogenization of music, with less individuality or cultural nuance.

(b) Ethical and Ownership Issues: Another major issue arises related to ownership of intellectual property. Who will own the ownership of a piece of music created by AI? If AI learns from copyrighted material and uses it in the production, there may be concerns about unauthorized use of existing works.

(c) Job Displacement in the Music Industry: Too much automation of tasks like lyrics writing, composing and producing music, or mixing and mastering could reduce the need for human professionals, affecting jobs in the industry.



(d) Cultural and Creative Concerns: Too much emphasis on AI based music production may overshadow the importance of traditional methods and cultural authenticity. Use of the "fast-food" approach to music production may increase quantity but will definitely compromise quality.

(f) Bias in AI Systems: Inadequately developed AI models are often found biased and might perpetuate stereotypes or overlook diverse musical traditions. Such models often lead to a lack of representation for underrepresented artists and genres.

(g) Over-reliance on Technology: - Relying too much on AI might stifle personal growth for musicians, as they may skip mastering fundamental skills. The organic learning process of trial and error in music creation could diminish.

Conclusion

As discussed above, AI in music can be considered as a double-edged sword. Although it offers exciting opportunities for creative works, accessibility, and efficiency, it also poses few significant challenges related to authenticity, ethics, and the balance between technology and human creativity. The major thrust is to use AI as a tool to complement, not replace, the human touch that makes music truly resonate with the soul.



PRIDE AND SAUSAGE

IN A CITY THAT SWELLED WITH SMOG, BHUPINDER WOKE UP WITH IMMENSE HOPE. THE WINTER OFFICE HOURS WERE INSPIRING: HE COULD NOW BOAST OF EARLY RISING.

AS THE CLOCK SWEPT PAST EIGHT, BHUPINDER TURNED UTTERLY IMPATIENT: HIS COLLEAGUES MUST HAVE ARRIVED BY THEN, AND HE WAS YET TO IRON HIS PANT. HE SCREAMED AND YELLED AT THE MAID ON LEAVE; HIS COLLEAGUES IGNORED HIS THEATRICALS AND GRIEFS!

OUT HE WENT, DOOR SLAMMED AND LOCKED; JUMPED IN THE VAN WITH SPIRIT OF THE GODS. HE APOLOGIZED FOR THE DELAY CAUSED, HIS COLLEAGUES SAW A SAUSAGE ON HIS COAT, PINNED TO HIS COAT, PINNED TO HIS CHEST LIKE A SYMBOL OF PRIDE, WHERE WAS HIS BADGE? NONE KNOWS WHERE THE TRUTH LIES!

> ~ RUPAM GOSWAMI ASSISTANT PROFESSOR, TEZPUR UNIVERSITY

অপুৰণীয় স্মৃতি

হেৰুৱাৰ বিষাদ হেৰুৱা গৰাকীৰ তুলনাতীত তুলনাহীন বিষাদত মৰ্মাহত এখন বুকু অনুভৱ কৰে বিশাল আবেগৰ বিৱৰণহীন বিতৃষ্ণতাৰ ঘূৰাই নোপোৱাৰ নিশ্চয়তাত আবদ্ধ কৰে নিজকে, জগাই তোলে গভীৰ আৰ্টোনৰ বিছাৰি উঠে বাৰে বাৰে তাৰ কণ্ঠ, তাৰ স্পৰ্শ তাৰ জীৱন্ত । বৃথা প্ৰচেষ্টাত নিৰাশ হয়, বিমুখ হয় । অবিহনে কৰা শূণ্যতাত মন জিকাৰ খায়, অভিমানী হয় ৰূপ<mark>ান্তৰ</mark> হয় অবুজনলৈ বিদায় বিদায় সোৱৰে, আকাশে বতাহে । ধোৱা হৈ বিলীন হয় ছাই হৈ মাটি হয় । ৰৈ যায় মাথোঁ স্মৃতি অপুৰণীয় স্মৃতি ।

> DR. BINANDA KHUNGUR NARZARY ASSISTANT PROFESSOR, TEZPUR UNIVERSITY



Whispers of a wounded heart

A CUCKOO SINGING MELANCHOLY ON THE BRANCH-SOLITARY AS SOLITARY AS ME. THE DEEP VACUUM OF MY HEART REMINDS ME-THE WOUNDS ARE FRESH. THE GASH IS RAW. BUT PEOPLE UNDERSTAND ME NO MORE. THE SKY, A SILENT CANVAS GRAY. ECHOES THE SORROWS OF THE DAY. THE BREEZE WHISPERS SECRETS IT CANNOT TELL. OF BATTLES FOUGHT WHERE SILENCE FELL. I REACH FOR WORDS BUT FIND THEM FEW. THEIR EDGES SHARP. THEIR MEANINGS SKEWED. ACHING TO SHARE. YET BOUND BY FEAR. THE WORLD SEEMS DISTANT, DEAF, UNCLEAR. THE CUCKOO SINGS ITS SOLEMN TUNE. BENEATH THE GAZE OF A DIM-LIT MOON. DOES IT CRY FOR LOVE, FOR LOSS, FOR PAIN? OR FOR THE HOPE OF LIGHT AGAIN? IN ITS SONG, I HEAR MY PLIGHT, A SHADOW DANCING IN THE NIGHT. YET AS THE NOTES DRIFT SOFT AND FREE. I WONDER—COULD THEY SET ME FREE? I MUSE, IF LIKE THE CUCKOO, I MUST SING. AND LET MY VOICE THROUGH SILENCE RING. FOR IN THE ECHOES, ONE MIGHT FIND, MELODIES OF MY FRACTURED MIND.

> ~DR. ROSY SARMAH, ASSOC. PROF. , TEZPUR UNIVERSITY

অলপ মোৰ, আৰু অলপ...

আহিনী ৰ'দৰ কোলাত পৰি কোৱা-কুই কৰিছিলো যে নৰাৰ পিঠিত বাগৰি চিট্-চিট্ পিঠি মাইৰ চিটিকনি খেদন বুটলি মৈমনসিঙিয়া ধানৰ ঠোক জিৰ্ জিৰ্ জুৰণীয়া জুৰিৰ পাৰ

পাৰ ভাঙি অহা এলেহুৱা দুপৰৰ হামি

মৃত শিল দুটাৰ সমুখত বহি আমি মৃত্যুৰ কথাই পাতিছিলোঁ সোঁতৰ উচুপনি শুনি নৈখনক চাইছিলোঁ

> মোৰ ছাঁ আৰু তোমাৰ স্বপ্নৰ আলিদোমোজাত আঁহত গছৰ নিৰাভৰণ উপত্যকাত মেলি দিওঁতে দুহাত

> কোনেও একো নকলে আমাক এইবুলি, 'অকলেই পানীৰ মালা গুঁঠিবা, ঢৌ ঢৌ মুকুতা…'

> ৰ'দৰ কোলাত পৰি আমি গুণগুণাইছিলো যে মৃত দুচটা শিলৰ আঁৰেদি শীত অহালৈ ৰৈছিলোঁ

> > ৰৈ আছোঁ…

চিৰকাল উৰি উৰি পাখি ভঙা চৰাই এটা হৈ গৃহহীন শিশু এটি হৈ কাকো নমতাকৈ অভিমানী জুৰি এটি হৈ বৈ বৈ…ৰৈ ৰৈ…

~ লুইত কিৰণ দাস, গৱেষক ছাত্ৰ, অসমীয়া বিভাগ



The Poet's Poem

OH, TO BE THE POEM, NOT THE PEN THAT WRITES, TO DWELL WITHIN THE LINES OF HEARTS, LIKE STARS IN NIGHT, TO BLOOM LIKE FLOWERS KISSED BY MORNING DEW, IN VERSES BRIGHT WHERE DREAMS AND HOPES ENSUE.

TO BE THE WHISPER IN THE TWILIGHT BREEZE, THE MELODY THAT DANCES THROUGH THE TREES, A TALE TOLD IN THE SOFTEST SHADES OF LIGHT, A STORY CRADLED IN THE ARMS OF NIGHT.

OH, TO BE THE SUN THAT WARMS THE STREAM, THE SHIMMER IN A LOVER'S WAKING DREAM, TO TUMBLE LIKE A WATERFALL'S EMBRACE, AND ECHO THROUGH THE CANYON'S TIMELESS SPACE.

WHAT JOY TO BE THE PAINTED DAWN, IN METAPHORS WHERE LOVE IS DRAWN, TO BE THE MORNING MIST, THE TENDER SIGH, THE VOICE THAT SOARS THROUGH THE ENDLESS SKY.

YET HERE I STAND, THE POET WITH INK-STAINED HANDS, CRAFTING WORLDS FROM SHIFTING SANDS, I WEAVE THE DREAMS THAT OTHERS SEE, BUT WHO WILL EVER WRITE OF ME?

AM I TOO PLAIN, TOO FLAWED TO BE, THE MUSE THAT STIRS THE POET'S PLEA? AM I NOT WORTH A SINGLE RHYME, A THOUGHT PRESERVED IN THE VAULT OF TIME?

OH, TO BE A CHARACTER IN A TALE, WHERE EVERY HEART AND HOPE PREVAIL, TO BE ADORED IN WRITTEN WORD, A SILENT SONG THAT'S ALWAYS HEARD.



BUT HERE I WRITE WITH LONGING DEEP, A POET'S HEART THAT CANNOT SLEEP, WISHING I WERE THE POEM INSTEAD, IN PAGES WHERE LOVE'S LIGHT IS SHED.

OH, TO BE THE POEM, NOT THE SCRIBE, TO REST IN HEARTS, A CHERISHED VIBE, IN EVERY SOUL TO FIND MY PLACE, A TENDER WHISPER, A SOFT EMBRACE.

WISH I WAS THE POEM, AND NOT THE POET'S QUEST, IN LINES OF BEAUTY WHERE HEARTS FIND REST, TO BE THE DREAM, THE WHISPERED PRAYER, IN WRITTEN WORDS, FOREVER THERE.

> ~ HIMANGSHU LAHKAR DEPT. OF ELECTRONICS AND COMM. ENGG.





EVENT HIGHLIGHTS:

1.Technical Events :

HackXetra:

A three-day marathon of coding, brainstorming, and innovation, where participants developed techdriven solutions to real-world problems. This event encouraged teamwork and practical application of technical skills in a competitive setting.

Code Clash:

A high-energy coding competition where participants showcased their problem-solving and programming skills. The event attracted both novice and expert coders, presenting them with challenging real-time scenarios.

Frontend Frenzy:

A dynamic competition focused on web design and development, where participants crafted visually stunning and user-friendly interfaces. This event challenged creativity, technical skills, and attention to detail in a race against time.

Robo Soccer:

An exciting robotics competition where teams built and programmed robots to compete in a soccer match. Participants showcased their engineering and coding expertise in a thrilling test of precision, speed, and teamwork.

Robo Sumo:

A high-adrenaline robotics contest where participants designed robots capable of pushing their opponents out of a ring. This event tested both the strength of their designs and the strategies behind their control mechanisms.

Circuitrix:

An electrifying event where participants designed and built innovative circuits to solve real-world problems. It tested their knowledge of electronics, creativity, and problem-solving skills in a fast-paced environment.

Kinematic Model:

A platform for mechanical enthusiasts to design and showcase innovative mechanical models. This event celebrated precision engineering and problem-solving creativity.

Constrolix (Bridge Construction):

An engineering marvel event where participants used their creativity and structural knowledge to build durable and efficient bridges. It tested their understanding of civil engineering principles in a hands-on environment.

Ideathon (Sustainathon):

Where visionary ideas meet real-world impact. Teams tackle pressing sustainability issues, presenting

bold and actionable strategies for a greener future.

2. General Events :

Techxibition:

A platform where students of all levels displayed innovative projects, from technology-driven prototypes to creative ideas, fostering inspiration and collaboration.

Wrangle: Debate

An intense platform for articulate minds to engage in structured arguments on critical topics. Participants showcase their analytical skills, logical reasoning, and persuasive rhetoric in a battle of ideas.

Full Force (Science-Technical Quiz):

A quiz diving deep into science and technology, challenging participants on everything from fundamental principles to cutting-edge innovations.

Full Screen (MELA Quiz):

A quiz celebrating pop culture, including movies, entertainment, literature, and art. It offered a blend of fun and intellect for trivia enthusiasts.

Full Sprint (Sports Quiz):

A specialized quiz covering iconic sports moments, technical aspects of games, and legendary players, making it a delight for sports lovers.

Full Throttle (General Quiz):

A quiz spanning a broad range of topics, including history, geography, science, current events, and entertainment, engaging a wide spectrum of participants.

Full Frontier (NE India Filler Quiz):

A quiz dedicated to the unique culture, history, and heritage of North-East India. This event aimed to educate and celebrate regional pride.

Treasure Hunt:

A thrilling adventure that combines strategy, problem-solving, and teamwork. Participants race against the clock, deciphering clues and overcoming challenges to uncover hidden treasures scattered across the event grounds.

Chess:

Battle of minds where strategy, patience, and foresight reign supreme. Participants engage in intense, head-to-head matches, testing their tactical brilliance and mental acuity in the timeless game of chess.

Rubik's Cube:

A fast-paced challenge of speed and spatial reasoning. Participants race to solve the iconic puzzle, demonstrating their problem-solving abilities and quick thinking under pressure, all while mastering the art of the twist.

3. Physical Sports

Shuttle Bash:

A thrilling badminton tournament held at the Indoor Stadium. The event saw intense matches as players competed in preliminary rounds leading to nail-biting finals.

Triple Heat (3v3 Basketball):

A fast-paced basketball event where teams of three competed to score points and claim victory. It combined strategy, teamwork, and athletic prowess.

Futsal (5v5 Football):

A compact football tournament designed exclusively for university students. It featured exciting matches from the quarter-finals to the dramatic semi-finals and finals.

Inaugural Marathon:

A fitness-focused event that kickstarted TechXetra 2024. Participants came together for a morning run, embodying the spirit of health and unity.

4. D' Colosseum (Gaming Events)

Bullet Echo:

A tactical multiplayer gaming competition that tested strategic planning and execution in a thrilling, competitive atmosphere.

FIFA:

The virtual football tournament where gamers battled it out on the console, displaying their mastery over FIFA gameplay mechanics and strategies.

BGMI (Battle Grounds Mobile India):

A high-stakes eSports tournament where players demonstrated their tactical and survival skills. Only the final event was LAN and offline, providing an electrifying experience for participants and spectators.

Road to Valor:

A multiplayer strategy game event where participants demonstrated their ability to plan, build, and conquer in a test of tactical genius.

Real Cricket 24

A 1v1 online cricket competition

5. Cultural competitions

Choral Strings

An electrifying competition where different bands compete against each other in a Battle of Bands for the top prize

Nrityante Drishyam

A classical group dance competition showcasing the cultural vibrancy of the country

Technical	Events
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EVENT NAME	TOTAL TEAMS	TOTAL Participants
HackXetra: Hackathon	16	76
Code Clash: Coding Contest	-	28
FrontEnd Frenzy	-	16
Robosoccer	8	32
Robo Sumo	8	32
Circuitrix	17	47
Kinematic Model	5	9
Constrolix: Bridge Construction	20	71
Ideathon(Sustainathon)	16	51
Technical Poster(College Level)	6	-
Technical Poster making(School Level)	25	59
Poster Presentation (Research based)	2	4

Sports Events

EVENT NAME	TOTAL TEAMS	TOTAL PARTICIPANTS
Inaugural Marathon(MEN)	-	35
Inaugural Marathon(WOMEN)		8
Shuttle Bash	32	64
Futsal	16	122
5v5 Triple Heat(Men)	8	31
Triple Heat(Women)	4	16
Chess		78
Rubics Cube		50

All total of **626** teams and **2418** players participated in TechXetra 2024.

General Events

EVENT NAME	TOTAL TEAMS	TOTAL PARTICIPANTS
TechXibition:School level (class 5 to 8)	6	17
TechXibition: School Level (class 9 to 12)	11	36
TechXibition: UG level	3	5
Wrangle: Debate (Junior level)		19
Wrangle: Debate (University level)		29
Full Force: Technical Quiz	19	74
Full Throttle: General Quiz	31	123
Full Sprint: Sports Quiz	29	114
Full Screen: MELA Quiz	29	110
Full Swing: School Level Quiz	53	97
Full Frontier: The North-East Quiz	19	76
Treasure Hunt	80	240

E-Sports

EVENT NAME	TOTAL TEAMS	TOTAL PARTICIPANTS
FIFA		33
BGMI	87	348
Bullet Echo	45	135
Real Cricket	45	135
Road To Valor	22	44

Cultural Events

EVENT NAME	TOTAL TEAMS	TOTAL PARTICIPANTS
नृत्यान्ते दृश्यं (Nṛtyānte Dṛśyam)	4	37
Coral Strings: Acoustic Singing	5	27

Robophronesis



Robophronesis is an exhilarating robotics event that brings together innovation, strategy, and engineering prowess. The event features two thrilling competitions: Robo Soccer and Robo Sumo. In Robo Soccer, teams design and program robots to compete in a fast-paced soccer match, combining precision, speed, and teamwork to score goals and outwit opponents. On the other hand, Robo Sumo challenges participants to build robust and intelligent bots capable of pushing their rivals out of the ring, showcasing strength, balance, and tactical superiority. Robophronesis promises to be a spectacle of technological ingenuity, offering participants and spectators an unforgettable experience filled with excitement and creativity.

Venue: BasketBall Court Date :10th November(day 3) Time 1:00AM Judges: Jotishman Bharali and Mushabir Islam

Winners

1)Robo Soccer:-

Position	TeamName	Collage	Members
1st	Rhinobotz	AEC	 RajdeepBorah BedantaSarma Wahidul Haque Geetartha Borgohain Md.ArikKhan PrachuryaKataki
2nd	Arcelor	AEC	BitopanDasRuhilChetiaJitulKalita

2)Robo Sumo:-

Position	TeamName	Collage	Members
1st	Psychotron	JEC	 Caleb Varnunthar Varte RimanSharma Archit Aryaman Krishnavsankar Sarmah
2nd	Rhinobotz	AEC	 RajdeepBorah BedantaSarma WahidulHaque GeetarthBorgohain Md.ArikKhan PrachuryaKataki

KINEMATIC MODEL MAKING



Offline mode at lecture hall, Dept. of Mechanical Engineering.
 Starting time: 11:00 AM
 Duration: 2hr

Kinematic model making competition was an offline event held as part of TechXetra 2024 at Tezpur University on 8 nov, 2024. It provided a platform for participants to demonstrate their machine designing skills.







- Offline mode at Lecture Hall 2, Dean's Building. - Participants had the flexibility to work from any location within the campus.

Hackxetra was an offline hackathon event held as part of TechXetra 2024 at Tezpur University from November 9 to November 11, 2024. It provided a platform for participants to demonstrate their development skills by tackling real-world problem statements in various domains.

Hackathon Structure

- Problem Statements:
- Six challenges provided:
- Two in Web Development
- Two in AI/ML
- Two in Web3
- Teams were free to select any problem and work towards building a functional solution.

Judging Criteria:

Projects were evaluated based on four key criteria. Innovation assessed the creativity and originality of the solution, focusing on how unique and forward-thinking the idea was. Technical Implementation examined the quality and complexity of the code, as well as the robustness and efficiency of the technical solution. Relevance considered how well the project aligned with the given theme or problem statement, ensuring the solution addressed the core issue effectively. Lastly, Presentation and Demo evaluated the clarity and effectiveness of the communication and demonstration, highlighting how well the project was explained and showcased to the judges.

Total 16 teams participated. Each team consisted of 2-5 members.



Winning Team (High Five)

CONSTROLIX



 Venue: Seminar Hall, Civil Engineering Department, Tezpur University 10th November 2024,
 Duration: 12.30pm – 5.00pm

The Civil Club organized "Constrolix," an exciting bridge-making competition aimed at testing participants' structural engineering and resource optimization skills. The challenge required participants to construct a bridge capable of bearing the maximum load while maintaining the minimum weight. Judging was based on the efficiency ratio of load-to-weight, with strict constraints on time and resources. The event showcased innovative designs, teamwork, and practical application of engineering principles, fostering creativity and technical expertise among participants.

Competition Structure:

Participants were tasked with building a bridge measuring 50 cm in length, with a width equal to the length of a single stick and an optional height. Each group was provided 150 sticks, glue, a thread roll, and a cutter to construct their design within the given constraints.

Judging Criteria:

The judging criteria for the task will be as follows: Teams must complete the assigned task within a standard duration of 3 hours. If a team is unable to meet the deadline, an additional 30 minutes will be provided for task completion. However, taking this extra time will incur a penalty. The penalty will be proportional to the amount of time utilized beyond the initial 3-hour period, with a maximum deduction of up to 20 marks. The final evaluation will also consider the efficiency of the constructed bridge. This will be determined by calculating the ratio of the maximum load taken by the bridge to its self-weight. This ratio will contribute to the full percentage of marks for the task, reflecting the bridge's performance and design effectiveness. Teams are encouraged to balance speed with precision to maximize their score while minimizing deductions.





SUSTAINATHON



Venue: Seminar Hall, Dept of Energy, Tezpur University 10th November 2024, Duration: 2.00pm – 5.00pm

Sustainathon, hosted by Tezpur University as a part of the grand technical fest, TechXetra 2024, is a dynamic ideathon aimed at fostering innovative solutions to global sustainability challenges. Participants are invited to collaborate, innovate, and present ideas that can positively impact the environment, society, and economy. The competition focuses on creating practical, scalable solutions that address issues such as renewable energy, waste management, water conservation, sustainable agriculture, and more.

PRIZES	TEAM NAME	TEAM MEMBERS	INSTITUTE	
Winner	Twin Coordinates Bishal Dutta Prabal Pratik Barman		JorhatEngineering College	
1st Runner Up	Linear Labs	Hrishikesh Gohain Soumyadipta Chatterjee Tanmoy Kumar Debnath	erjee TezpurUniversity	
2nd Runner Up	Runner UpEcotaPallab Jyoti Rajbongshi Diptangshu Parashar Bhabeen Bhargav Saikia Jitul KalitaJorhatEngine College		JorhatEngineering College	

Winners











Photo Gallery













































DAY 3






















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GOLD SPONSOR



STRATEGIC PARTNER



RESIDENCY PARTNER





HOSPITALITY PARTNER



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