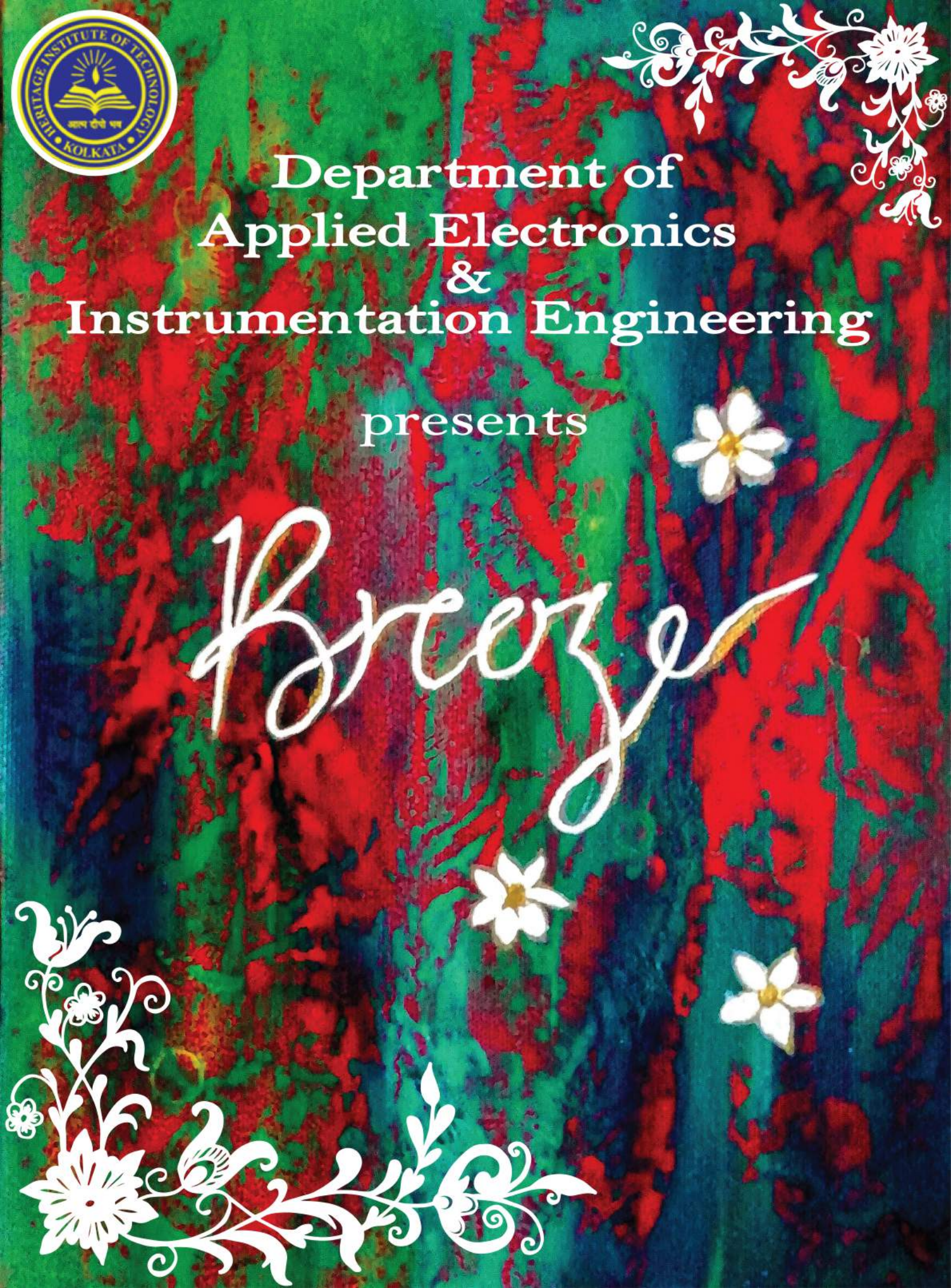

HERITAGE INSTITUTE OF TECHNOLOGY
KOLKATA
Department of
Applied Electronics
&
Instrumentation Engineering
presents
Breeze

Vision

To develop skilled Electronics and Instrumentation Engineers by providing learning ambience for academics & research leading to global competence with high academic credentials and to make the department recognized by the industries and teaching community

Mission

1. To prepare the students competent in the field of sensors, measurement, instrumentation, control, automations, signal processing, communication and computational techniques, etc. which are essential for industries, research organizations or higher studies.

2. To imbibe curiosity to students through industry-department interaction programs, workshops, seminars leading to better awareness about latest technology, research trends and to provide the students educational pathways for optional career choices.

3. To motivate the students towards lifelong learning and towards betterment of society by imparting practical skills.

Message from

HoD's Desk

The primary focus of the department of Applied Electronics & Instrumentation Engineering, Heritage Institute of Technology, Kolkata has always been all round development of students. In support of this endeavour I would like to announce with immense pleasure the publication of "Breeze", the yearly Students' e-magazine. The main objective of the e-magazine is to nurture and showcase the varied talents of students beyond their course curriculum. The department has preserved and published all the student activities/achievements throughout the year in this annual e-magazine. The magazine was originally supposed to be published in July, 2020, but because of the pandemic situation it has been delayed by few months. Despite of facing difficulties while assembling write ups and paintings virtually, our students with their tireless effort have made it happen. I would like to convey my heartfelt thanks to the faculty members/students who have worked day and night to lend it its final shape.

The most anticipated event that our department has been organising every year in the month of April, for the last 5 years i.e. the Inter college competition on Prototype Design for mankind has been postponed owing to the sudden imposition of lockdown in mid-March. Our department grew to be an adult last year and we hope to celebrate it soon. We wish to carry our desire towards excellence with similar enthusiasm that reaches wide and far.

Prof. (Dr.) Madhurima Chattopadhyay
Head, AEIE Department, HIT-Kolkata

Editorial

Dear readers,

The Department of Applied Electronics and Instrumentation proudly present to you, the 4th edition of our departmental e-magazine, Breeze.

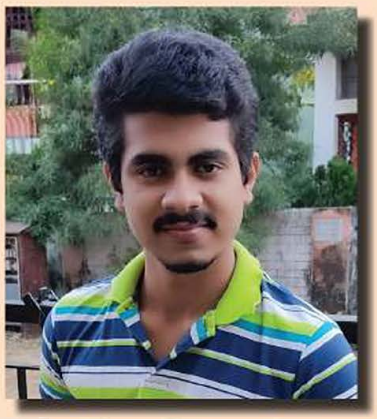
We hope this finds you in good health and spirits. The sole purpose of this magazine is to celebrate and showcase the artistic and literary talents of the members of our department in both technical and non technical fields.

Publishing a magazine, especially in these trying times was a challenge in itself. We would highly appreciate any feedback or suggestions from your side.

Last, but not the least, we would like to express our heartfelt gratitude to all those who have contributed to make this edition as engaging and enriching as the previous ones.

Thanking You,
Editorial Team

Designers



Ajay Satpati
AEIE, 2nd Year

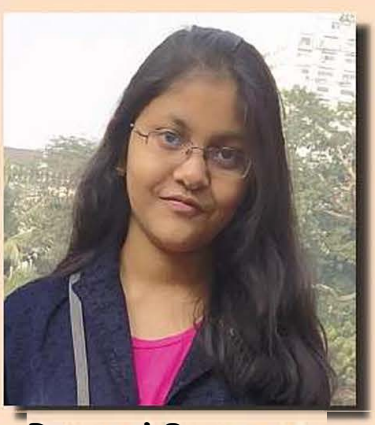
Drishti Kanoi
AEIE, 3rd Year

Content Organizers

Sreyashi Bandyopadhyay
AEIE, 2nd Year

Eeshika Ghosh
AEIE, 2nd Year

Content Selectors



Preyasi Sengupta
AEIE, 2nd Year

Mayukh Banerjee
AEIE, 3rd Year

Tadrup Das
AEIE, 3rd Year

Special Thanks for Helping us in Making this Magazine Possible

Harsh Ranjan Kumar
AEIE, 3rd Year

Riddhik Bhunia
AEIE, 4th Year

Rajdeep Bhattacharjee
AEIE, 4th Year

Rikth Chakraborty
AEIE, 4th Year

Special Thanks to the Teachers for their Continuos Guidance & Assistance

Pradip Saha
Assistant Professor
AEIE

Soumik Das
Assistant Professor
AEIE

Sujoy Kumar Das
Senior Technical Assistant
AEIE

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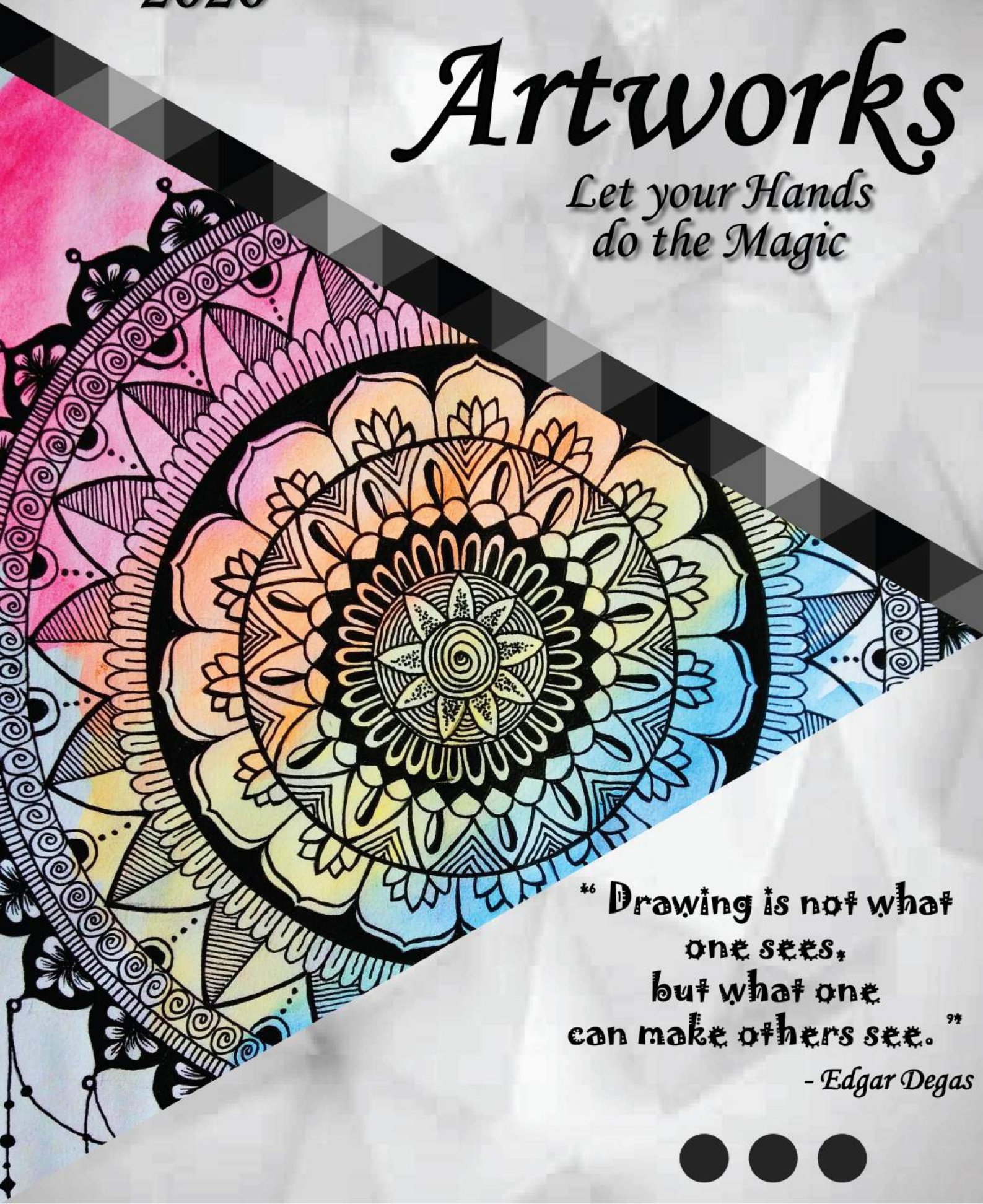
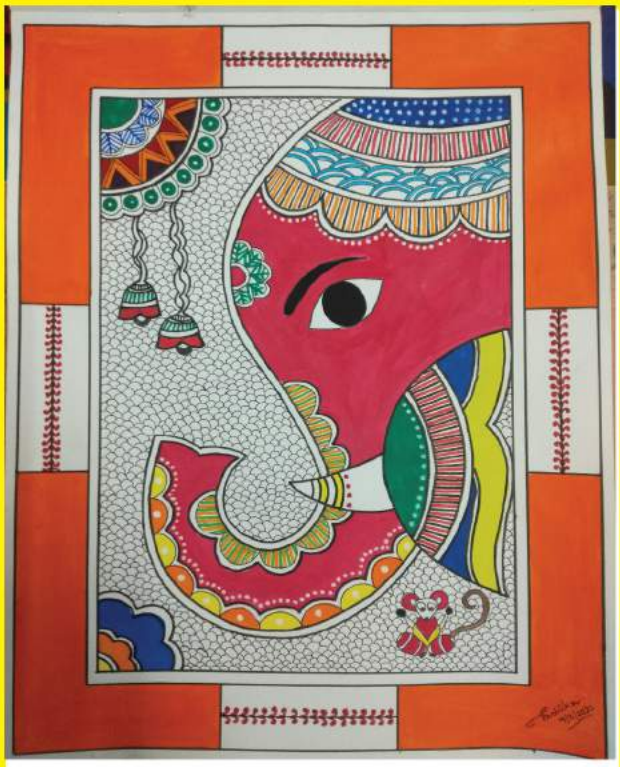
Artworks

Let your Hands do the Magic



"Drawing is not what one sees, but what one can make others see."

- Edgar Degas



Name - Eeshika Ghosh
Year - 2nd

Name - Drishti Kanoi
Year - 3rd

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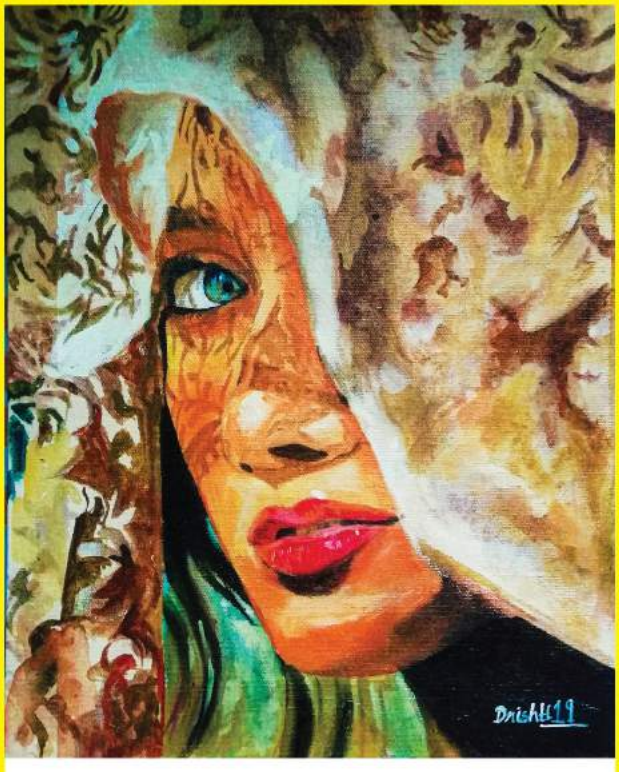
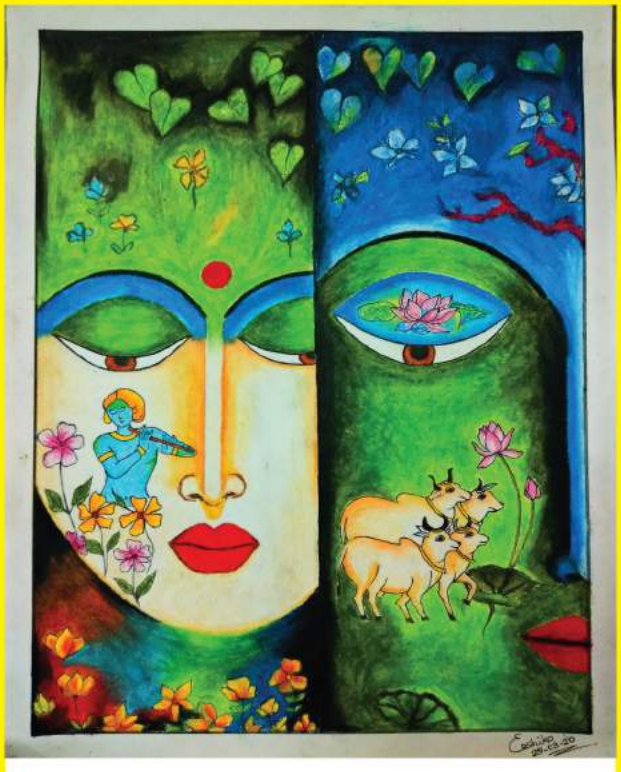


Name - Drishti Kanoi
Year - 3rd



Name - Eeshika Ghosh
Year - 2nd

Name - Drishti Kanoi
Year - 3rd

Name - Priyanka Bhowmik
Year - 3rd

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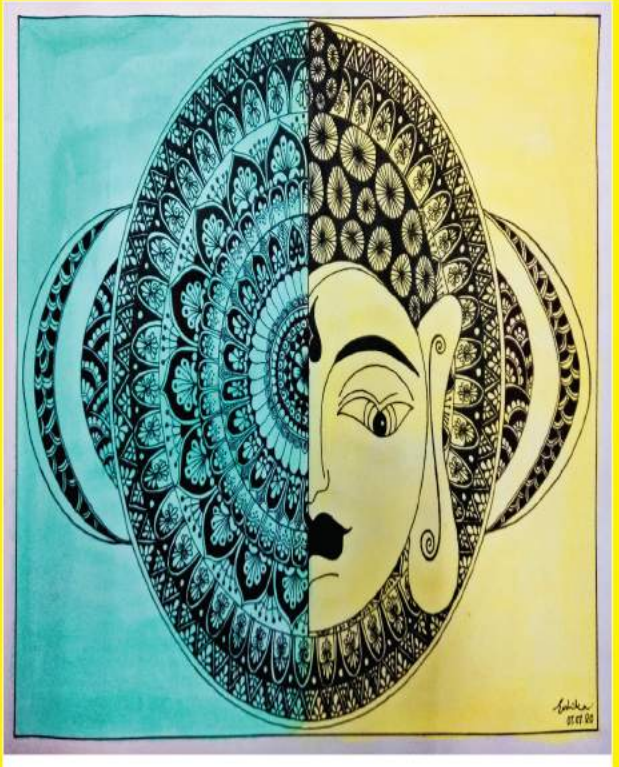
2020

Name - Priyanka Bhowmik
Year - 3rd



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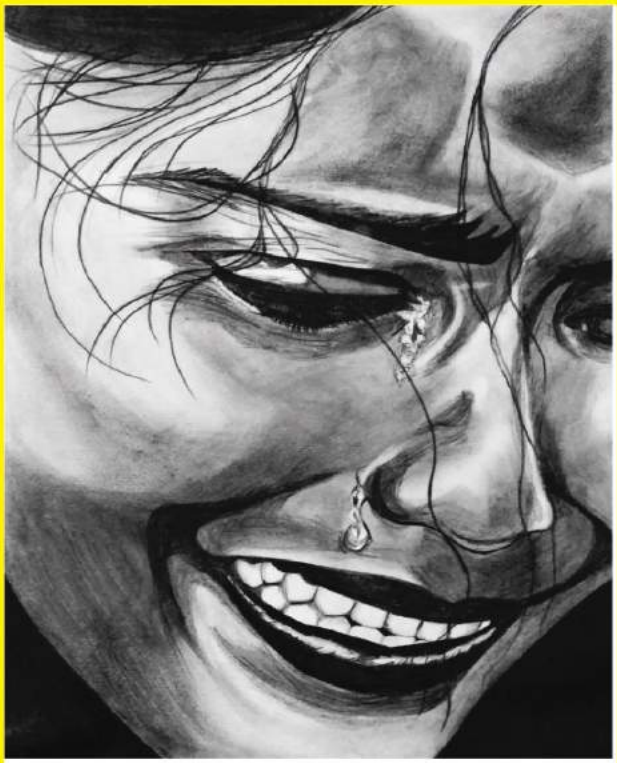
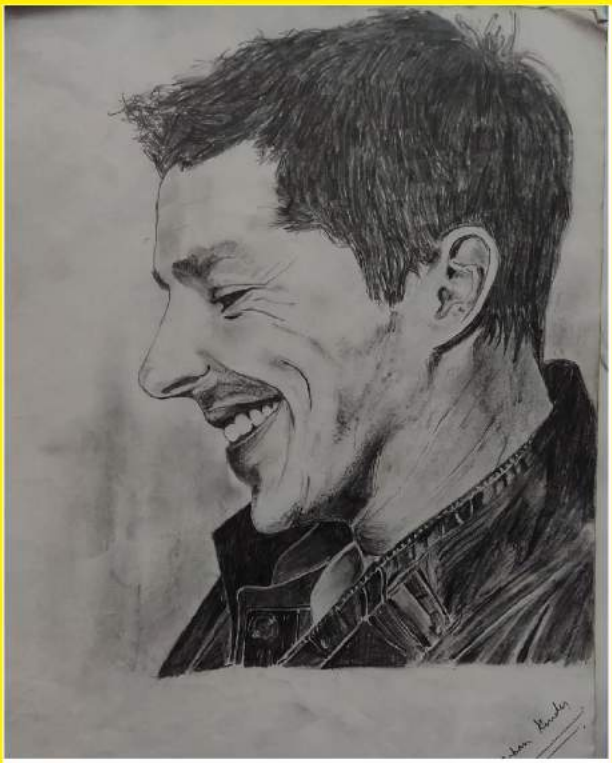
Year - 2nd



Name - Ajay Satpati
Year - 2nd



Name - Anirban Kundu
Year - 2nd

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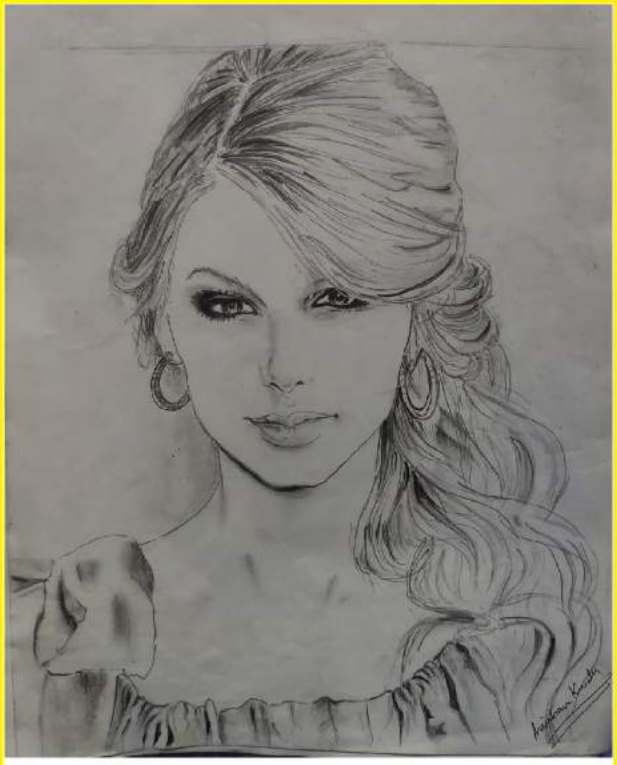

Name - Anirban Kundu
Year - 2nd

Name - Souvik Das
Year - 3rd

Name - Drishti Kanoi
Year - 3rd

Name - Atanu Pal
Year - 1st (M-tech)

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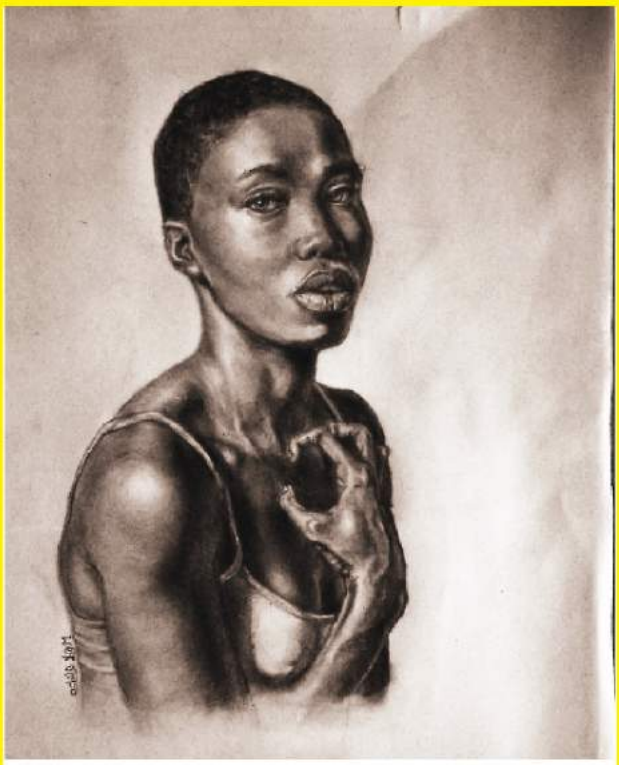
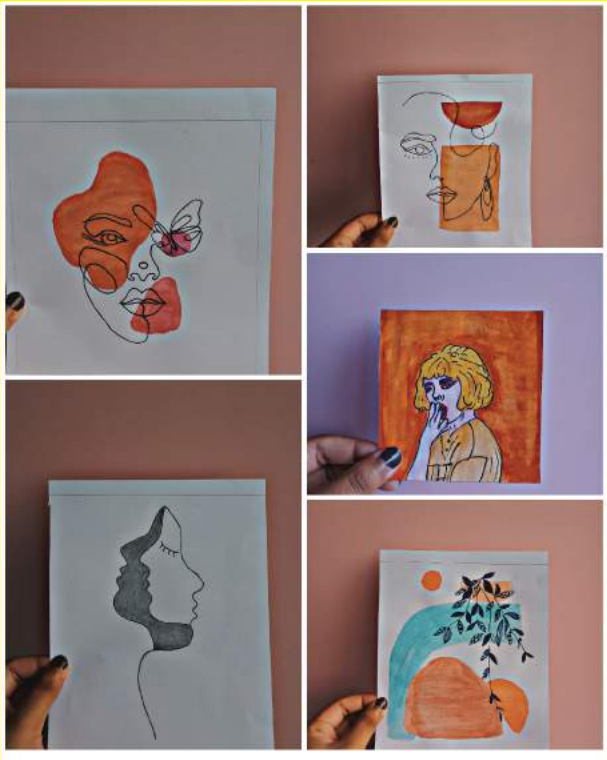
Name - Sambuddha Basu
Year - 2nd

Name - Sambuddha Basu
Year - 2nd



Name - Mayukh Banerjee
Year - 3rd



Name - Tithi Ghosh
Year - 4th

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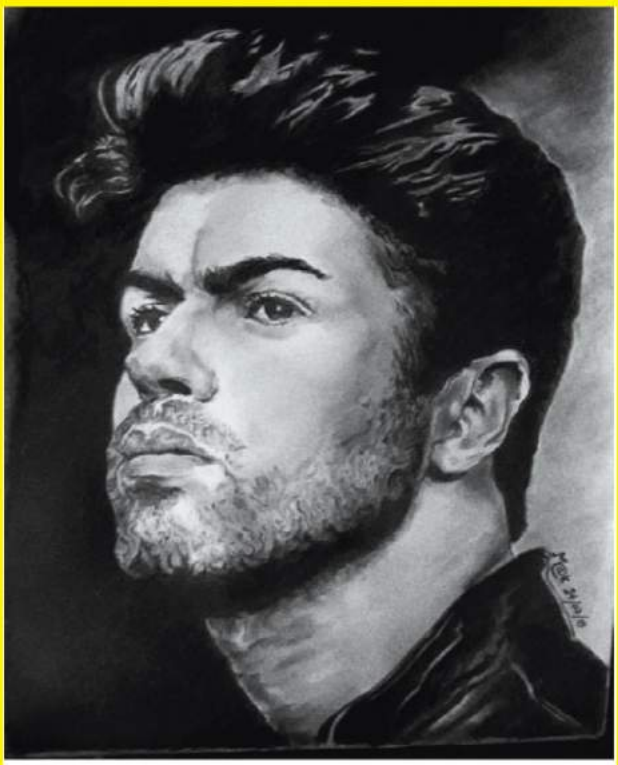
Name - Tithi Ghosh
Year - 4th

Name - Manshi Raj
Year - 3rd



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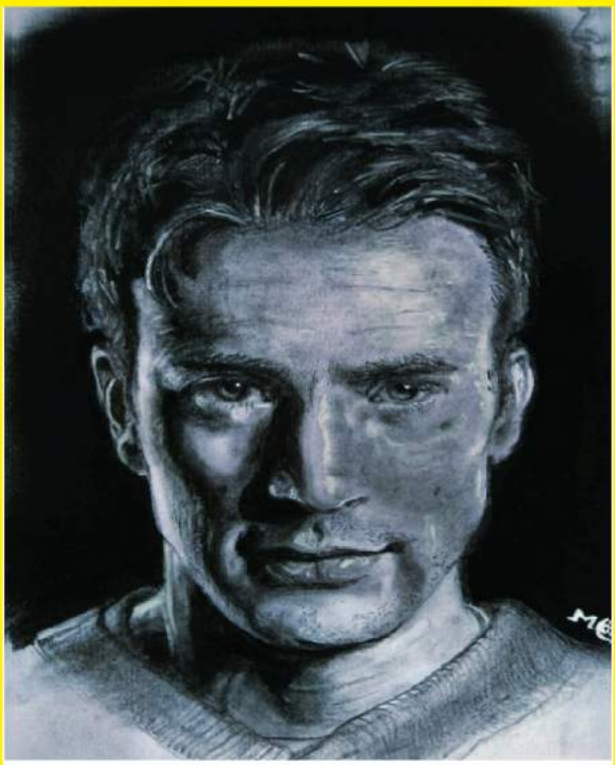
Year - 3rd



Name - Mayukh Banerjee
Year - 3rd

BREEZE
2020

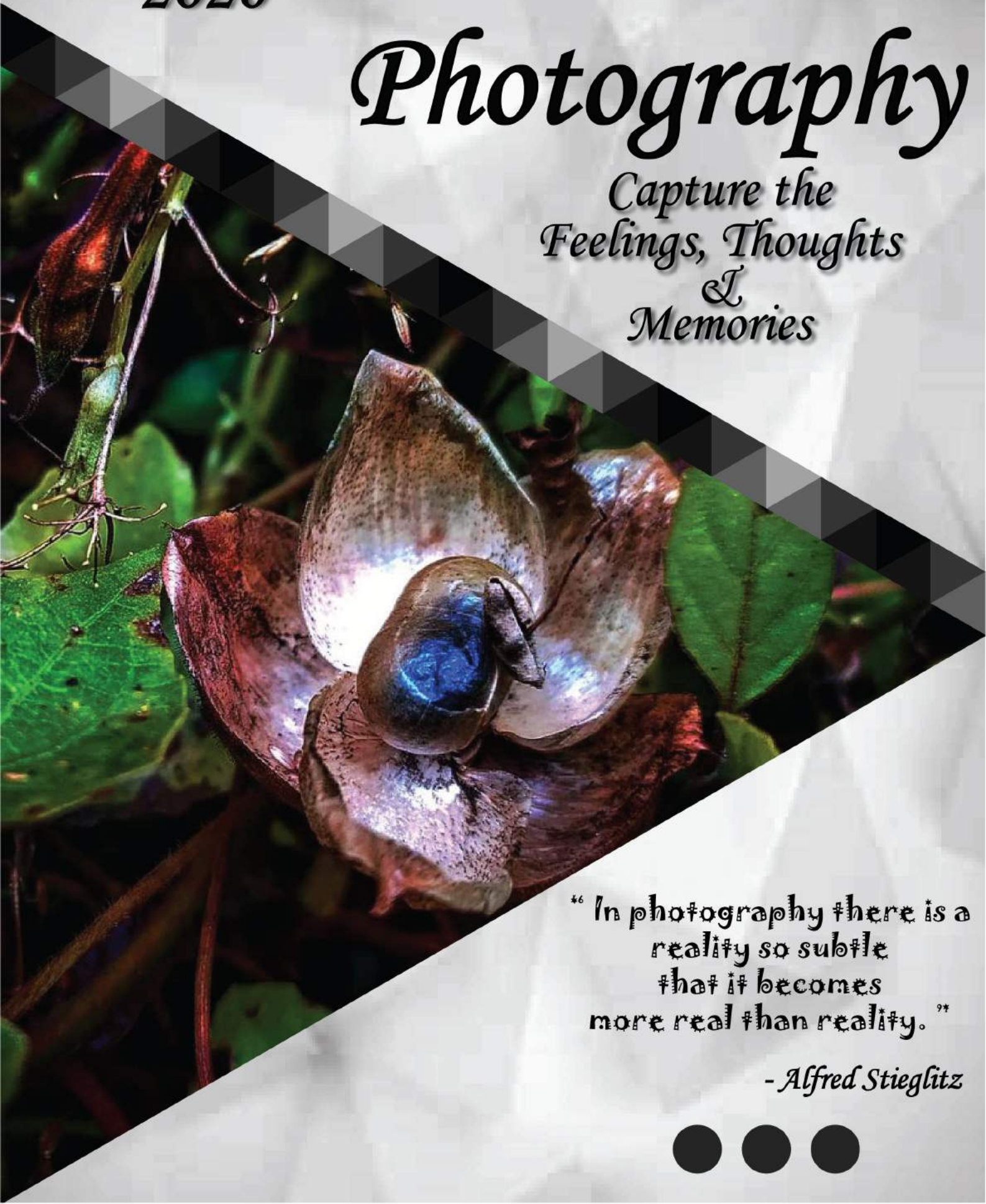
Name - Manshi Raj
Year - 3rd

Name - Mayukh Banerjee
Year - 3rd

Breeze
2020

Photography

Capture the Feelings, Thoughts & Memories



" In photography there is a reality so subtle that it becomes more real than reality. "

- Alfred Stieglitz

Name - Sreyashi Bandyopadhyay
Year - 2nd

Name - Ajay Satpati
Year - 2nd

Name - Atmodeep Ghosh
Year - 2nd

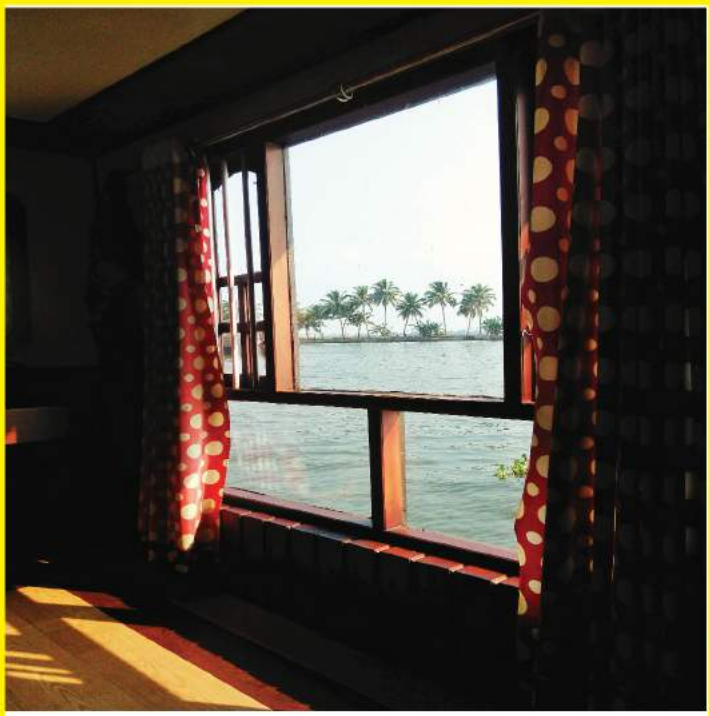
Name - Sreyashi Bandyopadhyay
Year - 2nd

Name - Arihant Chopra
Year - 4th

Name - Sougata Masanta
Year - 2nd

Name - Atmodeep Ghosh
Year - 2nd

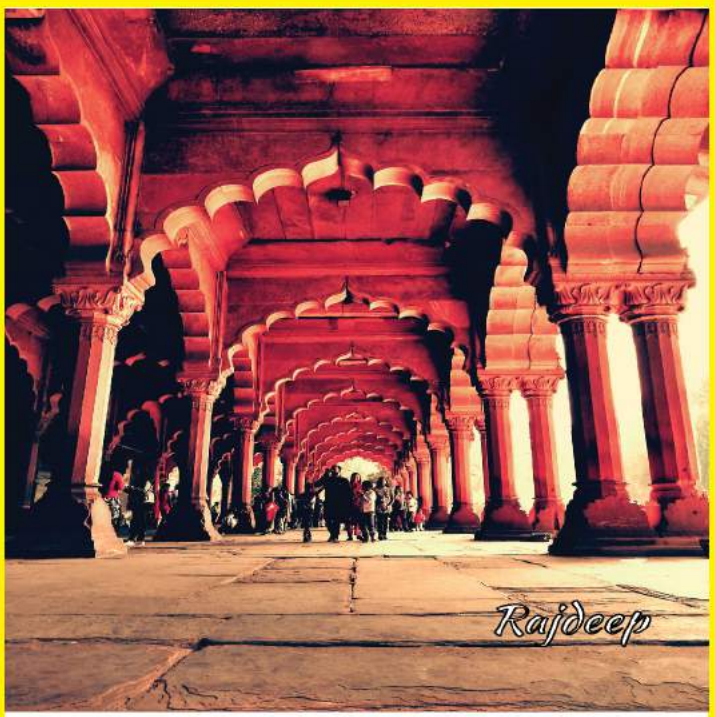
Name - Arihant Chopra
Year - 4th



Name - Ahana Dasgupta
Year - 3rd

Name - Priyam Maity
Year - 2nd

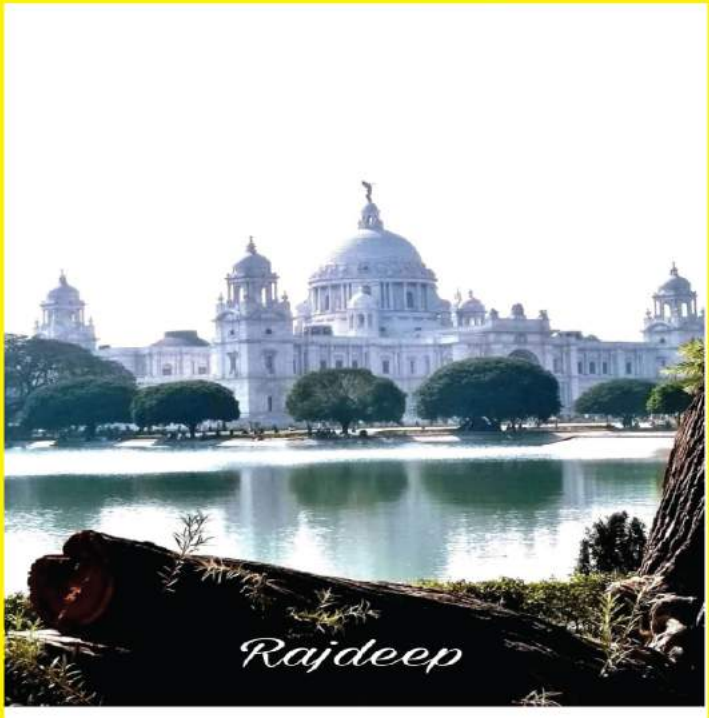
Name - Avinash Kumar Singh
Year - 2nd



Name - Rajdeep Bhattacharjee
Year - 4th

Name - Pranit Adhikary
Year - 3rd

Name - Rajdeep Bhattacharjee
Year - 4th



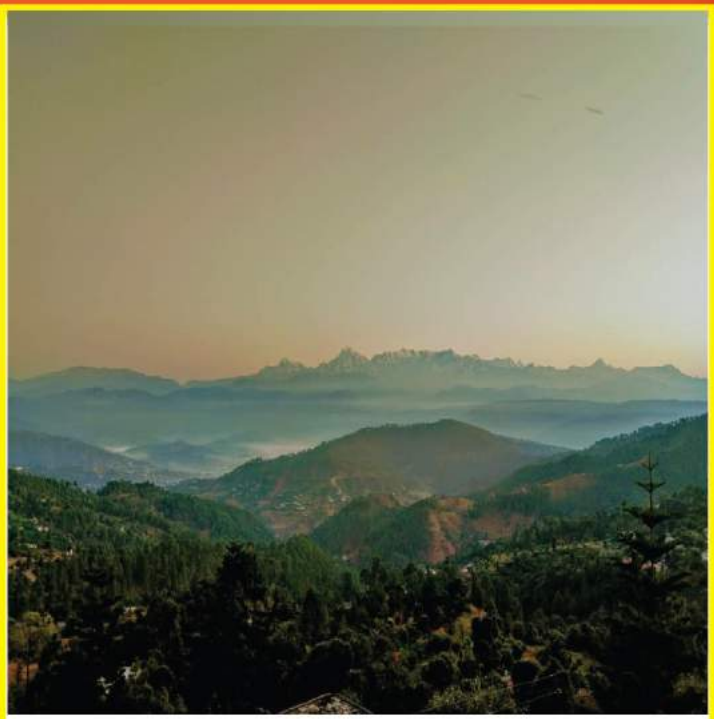
Name - Rajdeep Bhattacharjee
Year - 4th

Name - Pranit Adhikary
Year - 3rd

Name - Rikth Chakraborty
Year - 4th

Name - Swastik Supakar
Year - 3rd

Name - Rikth Chakraborty
Year - 4th



Name - Rikth Chakraborty
Year - 4th

Name - Samrick Manna
Year - 4th

Name - Samrick Manna
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Name - Samrick Manna
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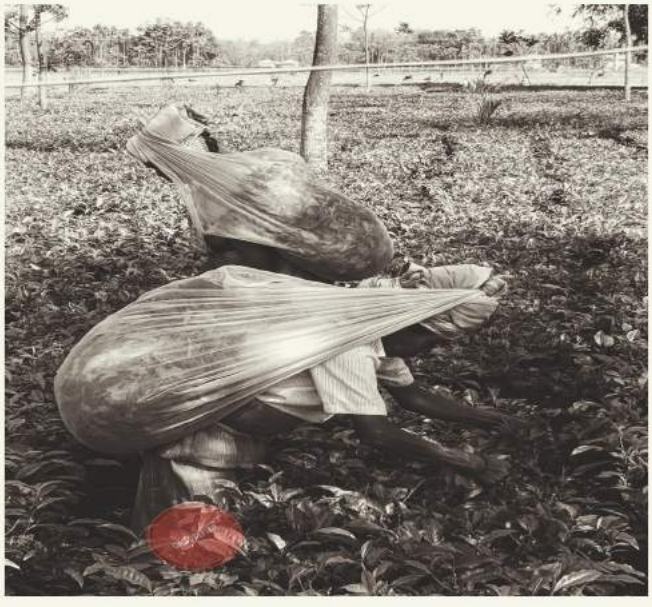
Name - Samrick Manna
Year - 4th

Name - Swapnendu Chakraborty
Year - 2nd

Name - Swapnendu Chakraborty
Year - 2nd



Name - Swapnendu Chakraborty
Year - 2nd

Name - Swapnendu Chakraborty
Year - 2nd

Name - Swagata Barik
Year - 1st (M-tech)

Name - Swagata Barik
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Year - 1st (M-tech)

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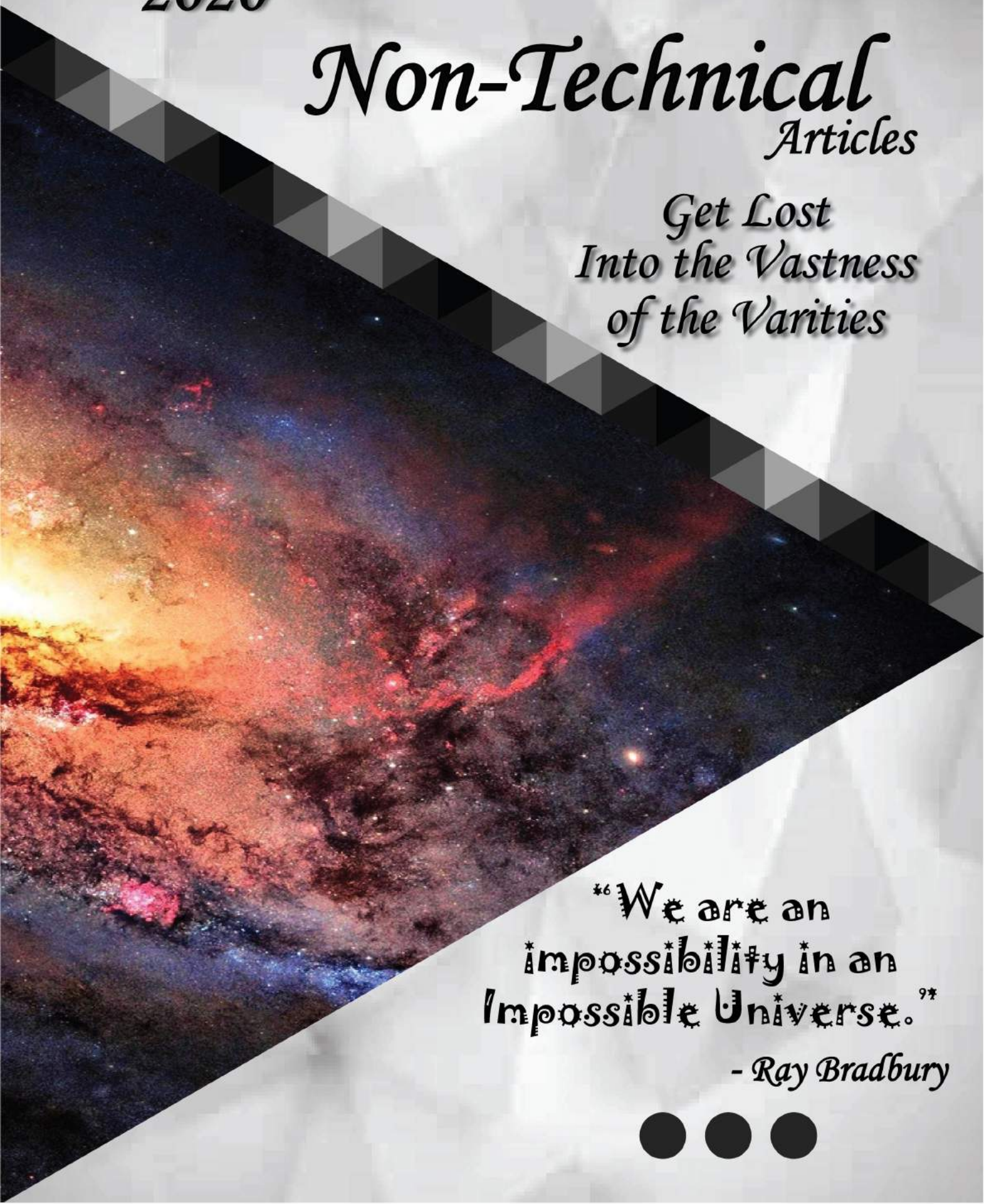
Year - 1st (M-tech)

Breeze 2020

Non-Technical Articles

Get Lost Into the Vastness of the Varities



"We are an impossibility in an Impossible Universe."

- Ray Bradbury

Purdah

We stood behind the purdah
Flowers enshrined with the red dye,
Chanting hymn in the parched daylight.

Inch by inch we snailed our way.
The Goddess was near,
Just A thousand steps away.

At the corner where the purdah veiled,
Blessings did they steal,
While hundreds lay by the side
Patiently waiting for a meal.

We somehow managed to trod the way
Only to stand behind the purdah and pray.
Through the purdah,
I looked at them and wondered,
If their cloud had a silver lining,
while mine was still grey.

She was the ultimate, the almighty
My wife longed for her sight,
But little did we know,
Even her heaven was HERE
Trapped in this hierarchy.

Dejected and confused we walked back
A car passed by, stained my dhoti with mud
GOD's men they were ,
how could I ever be taken aback!

I looked at my wife
And smiled; for if they had God
I still had her.
Gently I took it off,
And gifted her a new one ;
A Purdah with flowers designed...

Souvik Ghosh
AEIE, 2nd Year

So I started making music back in class 9 it was fun
but,
I never really showed/Posted it online because of my anxiety.
So in this lockdown i decided to post it on YouTube!
Here you go!

https://www.youtube.com/channel/UCcaA2hI4KTQJzUjiqIGQ7Vw?sub_confirmation=1

Click the link

Sameer Rahman
AEIE, 2nd Year

Space Opera

Are we living in a Space-Opera?
As Humanity grows ever so close to becoming a space faring civilization, the questionabout alien life is bound to arise. And so, it has, for quite some time. The question of alien life was popularized by the now famous Fermi Paradox, which asks a very simple yet seemingly unsolvable question- If we are any example of intelligent life, and given the abundance of earth like planets, why does the universe seem so silent? To be precise, in Enrico Fermi's own words "Where are they?".
There are theories that suggest that we are living in a fantastical space opera universe, such as the Zoo Hypothesis. This concept has already been used in several popular space opera movies, such as Star Trek. It suggests that aliens, super advanced aliens, may intentionally avoid earth to restrict interplanetary contamination and to let us naturally evolve as a space faring civilization. Another theory suggests that a super civilization is controlling the space and any civilization who comes close to match their technological superiority is destroyed, thus other civilizations, who are even nominally more advanced than us, are too afraid to reach out to us. Other popular theory known as the Transcension Hypothesis, that a sufficiently advanced civilization, might explore inner space rather than outer space. They may grow introvertedly, inventing smaller and smaller technology while transferring consciousness into a virtual world that is better than reality. Such a civilization may grow so tiny and reach a point where they vanish from outer perception. But of all this, the theory that makes most sense is the rare earth theory, that suggests that maybe life is commonplace, but intelligent life is exceedingly rare. We have reached this place through a very lucky chain of events, including mass extinctions.
The universe is so very vast, that even if there are hundreds of thousands of civilizations, and many of them space faring, even then, the chance of bumping into each other is very very remote. With only a sample size of one, it is extremely hard to tell how common life is.
But as humanity becomes ever so technologically advanced, there is an exceeding chance that we might actually find ourselves in midst of a space opera.

Bondhu Dey
AEIE 2nd Year

A world of contradictions wherein everything is grey and almost nothing is black and white.

https://www.instagram.com/p/B_Xsp7RAi5q/?igshid=5k44hm404h4c

Click The Link

Rwitoban Dey
AEIE 2nd Year

Woman: The Other

I'm still water.
I'm a blinding sandstorm.
I'm a woman.
Am I defined by my fathers name, or
my grandfather's fame,
Does fire burn when I burn
Do stories cry when the they say my name
A luggage, a commodity,an object,
a jewellery to adorn
Tell me I am wrong or God help me,
feel my rage.

why?

beacuse
I'm a force,
But I am unknown and I am forgotten.
I am peaceful untill I am brutal.
I am battered untill I am tamed.

because
You tell me how to dress,
You tell me how to hold my head.

You are not just a man,
You are an idea,
a disgraceful embellishment.
You are an ancient hoarding
which everyone reads,
But noone questions

and yet
i am The Other.
and you tell me how to dress
you tell me how to hold my head.

I'm defined by the mistakes you make
but not the pain i endure;
I am defined by everything
but just not my name
Am I just a womb,
your saving grace, your muse

Tell me do I need a man
just because I'm a woman?
Will it ever change, I wonder.
Just because you made me "the other".

Antarik Banerjee & Drishti Kanoi
AEIE 3nd Year

I recently started learning this beautiful instrument called the ukulele.
This was my first time. Learning a string instrument and working up from scratch was nothing but rewarding. Here i have provided a link for my Ukulele cover of Malagueña,a popular Spanish tune. Hope youll enjoy listening to this! If you like it do follow @edelweiss_0110 on instagram for more such content!

https://www.instagram.com/tv/CFMaOz9ARDX/?igshid=1mopjsxamhcwa

Click The Link

Sreyashi Bandyopadhyay
AEIE 2nd Year

Violin

Ever felt empty inside?
It's not new…. Circumstances led to these types of thinking and later it can develop into a psychological disorder.
There are no physical medicines for that but one thing can change everything – "Music".
One fun fact is that you can determine a person's nature just by looking to his musical taste! Isn't that amazing?
If you are into music you should definitely try an instrument. Any instrument you want but try and learn with patience.
My personal taste is violin. It's because it requires so much concentration and patience not everyone can master it. Just to complete the beginner level, it takes almost 3 years!!! And there is also a famous saying that a master had already invested over 10000 hrs into his instrument before he become a professional!
Just listen to violin players doing covers of your favourite songs. I bet you will forget everything, literally everything.
I don't know why Violin has a very sad tuning. It directly reaches the heart and capture you mind and you lost track of time.
It's literally surprising how a small instrument can capture you totally.
Don't you think Rhythm and Intonations can change you from completely depressed to completely interesting & awesome.
Go out into the open world. Don't just sit with your phone. Virtual world is not real, no one's going to appreciate you for a fake trophy you won in your stupid game.
Just think about it once….

Ajay Satpati
AEIE 2nd Year

দুটি লিমেরিক

মানস সরোবর

মানস সরোবরে নিয়মিত জমেই চলেছে ঘোলা জল আর পানা
আধুনিকতার মেকী ছোঁয়া লেগে লেগে নির্মল প্রবাহ এখন কানা
অথচ একটু ছাড়পত্র পেলে
ঈর্ষা, দ্বেষ, লোলুপতা ডুবে গেলে
প্রীতি, মমতা, দানের স্বচ্ছ ঘেরাটোপে সৌরভ ছড়াবে হাসনুহানা।

লৌহ বাসর

প্রথম দিকে থতমত, শঙ্খধ্বনি, মোমবাতি, ঘন্টা, কাঁসর ;
এখন সেসব উধাও হয়ে ডোন্ট কেয়ার মনের ভিতর।
ধোয়াধুয়ি হয়ত আছে, দূরত্ব বিধি অথৈ জলে;
মাস্ক নামিয়ে গলায়, চোর পুলিশের খেলাচ্ছলে,
খোলা নাকে-মুখে স্পষ্ট জেগে আছে লখিন্দরের লৌহ বাসর।

সুজয় কুমার দাশ
AEIE

Globatisation has changed the role of State and its Sovereignty

Globalization both as an ideology and process has become the dominant political, economic, cultural force in the 21st century and the role of state and its sovereignty.

Political role:

State once were supposed to be sovereign but now due to globalization, they often give their sovereignty away due to their pool towards international convention or a particular contract (can be a military expedition)or due to enhancement in interstate relationships and increasing multi track, regional & cultural diplomacy.

Many developing countries are now making political progression and regression together, so causing the state to be more dependent in case of attracting FDI and investors and hence they are being progressive at the same time.

Change in economic role:

In present context, Globalization is directly proportional to capitalism and has substantial effect on state's role.

The global economy has been created by online banking, stock markets and largely global franchises.

The state no longer controls all currency measures because of intangible assets, inter-state fund transfer and EXIM as well. So, in this sphere, international organizations such as WTO, IMF, WB have a dominant role in influencing the countries to gain investments and to adopt certain markets.

Social Dimension:

Various international NGOs and international organizations such as UNHRC, UN Women, ILO, UNICEF, and UNSC are very much able to increase the awareness regarding human rights violations & atrocities faced by women and children in societies and counter terror activities. These organizations are continuously challenging the public administration and role of government in the state.

Furthermore, globalizing the corporate sector has changed the leading role of government.

Changes in the doctrine of State Arbitrary Action:

This is a result of Unilateralism v/s multilateralism agenda of action. There was a time when unilateralism and bilateralism was the dominant doctrine but after WW2, this scenario has changed abruptly.

Different states across the length and breadth of the world came closer and started to share mutual relationships and goals with respect to their people, religion, culture and ideology .As a result, Multilateralism prospered.

A very common example of the result of multilateralism can be traced from the preamble of the constitution of India where we can see India as a Sovereign, Socialist, Secular & Democratic Republic which signifies the beauty , tolerance , unity and at the same time "The history of modern India".

Conclusion:

Globalization has delivered significant progress.

Every country has compromised their sovereignty for the sake of welfare and prosperity of their citizens. But if we go on to fact check it is the weaker countries that compromised more and at the same time they suffered more.

For e.g. USA being a stronger nation has shown its hegemony over weaker countries by putting sanctions without valid evidences for almost 60-70 years and its still continued just for its own goal and determinism.

Nowadays, a similar move can be traced with respect to China who is playing debt diplomacy through its so called Belt and Road Initiative.

Overall, this topic and has a broader base. It's not easy to have the proper checks and balances.

Susan Strange, a British scholar, put emphasis on globalization as real & sovereignty of states are being actually compromised. But, to what extent globalization has impacted sovereignty will remain a matter of debate!

Akash Kumar Bharti
AEIE, 4th year

Disagree

We are living in a world where we are constantly scrutinized for what we say, do and even think. I wonder sometimes how we go there where we are always triggered, offended and downright dismissive of a different opinion? When did we replace facts with feelings and truth with sensitivity?

We are losing our sense of disagreeability everyday, when we give up on individuality in a quest to become a more agreeable person,to conform to a group identity that feels good. We are setting up a stage where debates and exchange of ideas are being replaced by safe spaces. And as much as safe spaces are needed to protect us from extreme ideas, how are we to decide what is extreme and what isn't if we can't discuss and debate different ideas? Some might argue that free speech doesn't give you the right to offend someone, but I submit to you that in order to think freely and search for the truth you HAVE to risk being offensive. Because being outright dismissive of any idea isn't creating a safer space for anybody. We cannot restrict being offensive and insulting because too many things can be construed as such.The only viable solution to offence and insult is more of it,so that we can discuss the matters that make us uncomfortable, that makes think, because having the ability to disagree and think freely are at the core of being a human, and we should not lose that at any cost.

Bondhu Dey
AEIE, 2nd year

Different ways we can see Einstein's theory of relativity in real life

Relativity is one of the most famous scientific theories of the 20th century. Formulated by Albert Einstein in 1905, the theory of relativity is the notion that the laws of physics are same everywhere. The theory explains the behaviour of objects in space and time and it can be used to predict everything from existence of black holes to light bending due to gravity, to the behaviour of the planet mercury in its orbit.

The theory is deceptively simple. First, there is no "absolute" frame of reference. Everytime you measure an object's velocity, or its momentum or how it experiences time, it's always in relation to something else. Secondly, the speed of light is the same no matter who measures it or how fast the person measuring it is going. Third, no one can go faster than light. But we don't need a spaceship zooming at near the speed ofl ight to see relativistic effect. In fact there are several instances of relativity that we can see in our daily lives. Here are some ways we can see relativity in action.

(1) Global Positioning System (GPS)

In order for our cars GPS navigation to function as accurately as it does, satellites have to take relativistic effects into account. This is because even though satellites aren't moving at anything close to the speed of light there's still going pretty fast. The satellites are also sending signals to the groundstations on Earth these stations. These stations (and the GPS unit in our car) are all experiencing higher accelerations due to gravity than the satellites in orbit. Since each satelliteis 12,600 miles above the Earth surface and move that about 6,000 miles per hour there is a relativistic time dilation that tracks on about 4microseconds each day and in the effect of gravity the figure goes up to about 7 microseconds. The difference is very real if no relativistic effects were accounted for a GPS unit that tells us it's a half mile (0.8km) to the next gas station would be 5 miles (8 km) off afteronly one day.

(2)Gold's Yellow Colour

Most metals are shiny because the electrons in the atoms jump from different energy levels or orbitals. Some photons that hit the metal get absorbed and re-emitted though at a longer wavelength most visible light just gets reflected. Gold is a heavy atom so the inner electrons are moving fast enough that the relativistic mass increase is significant. Hence electrons in the inner orbitals carry energy that is close to the energy of the outer electrons and the wavelength gets absorbed and reflection are longer. Therefore longer wavelength means blue and violet lights are less and this makes gold appear yellowish in colours since yellow orange and red light have a longer wavelength than blue.

(3)Mercury is a liquid

Similar to gold mercury is also a heavy atom with electrons held close to the nucleus because of their speed and consequent mass increase. With Mercury the bonds between its atoms are weak so mercury melts at lower temperatures and is typically a liquid when we see it.

(4) Our old TV

Just a few years ago most televisions and monitors had cathode ray tube screens. A cathode ray tube works by finding electrons at a phosphor surface with a big magnet. Electron makes a lighted pixel when it hits the back of the screen. The electrons fired out to make the picture move at upto 30% of the speed of light. Relativistic effects are noticeable and when manufacturers shaped the magnets they had to take those effects into account.

(5)Light

If Isaac Newton had been right in assuming that there is an absolute rest frame we would have to come up with a different explanation for light because it would not happen a tall. Not only would magnetism not exist but light would also not exist because relativity requires that changes in an electromagnetic field moving at a finite speed instead of instantaneously.

Arko Bhattacharya
AEIE, 2nd Year

Hey guys check out my cover of an all time favourite bollywood song In Dino from the movie Life in a Metro!
Heres the link to my youtube channel. Hope you like it! Cheers.

https://youtu.be/dE8GAtAPxCU

Click The L ink

Esha Adhikary
AEIE, 2nd Year

Got to socialise my hidden talent, i.e - Dance, because of this lockdown.
Check it out once, and if you like it please consider giving a thumbs up & please Subscribe to my channel for more !

https:/www/youtube.com/c/TadrupDas

Click The L ink

Tadrup Das
AEIE, 3rd Year

Kansona -The forgotten Capital of the first sovereign King of Bengal

Remains of Raktamrittika Vihara, c.600 CE

Train in Karna Subarna railway station

Karnasuvarna was the capital of Gauda kingdom during the reign of the famous king Shashanka, the first independent king of ancient Bengal, in the 7th century. In his lifetime, Gauda Kingdom was not defeated by any external enemy. He defeated both the rulers of Kamarupa (Assam) and Kanyakubja (Kanauj) to expand his kingdom.

Almost all parts of undivided Bengal, as well as parts of Assam, Bihar, Jharkhand and Odisha were included in his kingdom. He occupies a prominent place in history of Bengal. It is thought that the development of the Bengali calendar took place under Shashanka's reign.

The ruins of Karnasuvarna is located at Kansona, 9.6 km south-west of Baharampur, headquarter of Murshidabad district.

Legend about Karnasuvarna (meaning 'made beautiful by Karna') is that, it was the Capital of the 'Anga' kingdom, that the Kaurava prince Duryodhana had given to the magnanimous Karna, the first born of Kunti. Karna Subarna railway station is situated in the Barharwa-Azimgang-Katwa loop of Eastern railway. Few passanger and express trains pass over the station. Bus services are also available to district headquarter Baharampur from Kansona.

The famous Chinese traveler Xuanzang (Hsuan Tsang) mentioned in his travelogue about Lo-to-mo-chi (Raktamrittika) Mahavihara, an important centre of learning of Vajrayana Buddhists near Karnasuvarna. It has been identified with Rajbaridanga.

The archaeological site of Rajbaridanga is about 2.4 km from Karnasubarna railway station in the bank of Bhagirathi River. Local transport like cycle vans, e-rickshaws (toto) are available.

Dr. Soumik Das
AEIE

Lassa Fever

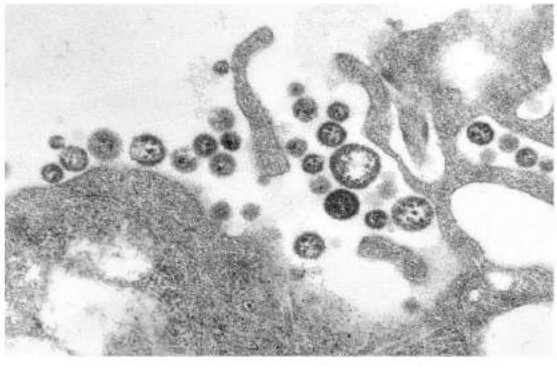
We all have heard about fever, but let us talk about the "Lassa Fever". Basically, it is quite different from a normal fever. It is also known as Lassa Hemorrhagic Fever(LHF). LHF is a viral disease which is caused by a virus named LASSA VIRUS. Sometimes, the people suffering from Lassa Fever seems to be asymptomatic. And if symptoms occur, they typically include fever, weakness, headache, vomiting and muscle pains. In a worst case scenario, there would be bleeding from the mouth or gastrointestinal tract. The risk of death of the person suffering from the disease is about 1%, and it has been seen that it frequently occurs within 2 weeks after the onset of the disease.

A Historical Look at the First Reported Cases of Lassa Fever:

Lassa Fever is an acute and severe viral hemorrhagic disease spread widely especially in West Africa. Virologists questioned about the duration of the immunoglobin IgG antibody in the body of the people infected with the deadly disease. They did the experiment on 3 people who used to work in Nigeria dating back to 1940s , two of them were integrally involved in the early outbreaks and investigations of Lassa fever in the late 1960s. Two persons have a very high concentration of Lassa virus specific IgG antibodies over 40 years after the infection, indicating the potential for long term duration of these antibodies.

Characteristics of Lassa Virus:

(1) Double-segmented.
(2) Single-stranded RNA virus, belonging to the genera Arenavirus, family Arenaviridae.
(3) Pleomorphic nature.
(4) Transmission through food or water contaminated with rodent urine or faeces.
(5) Duration of the virus 2-21 days.



Causes of the disease:

The disease is caused by the food or water contaminated with the urine and excreta of rodents. This method of transmission is quite common. It can also spread through cuts and open sores.

Symptoms of the disease:

(1) bleeding in the eyes, nose, or somewhere else.
(2) difficulty in breathing.
(3) cough.
(4) swollen airways.
(5) vomiting and diarrhea.
(6) hearing loss, which may be permanent.
(7) pericarditis
(8) encephalitis
(9) meninges.

Lassa fever is fatal. Among all the hospitalizations, around 15-20% cases will end up in mortality.

Treatment of the disease:

Rehydration and treatment of the symptoms will be beneficial to the person, if he or she is diagnosed early with proper measures. The antiviral drug Ribavirin, has been proven to be useful for the diagnosis.

There is no vaccine, currently, available for the cure. But scientists are really trying hard to make an effective vaccine as soon as possible.

Prevention:

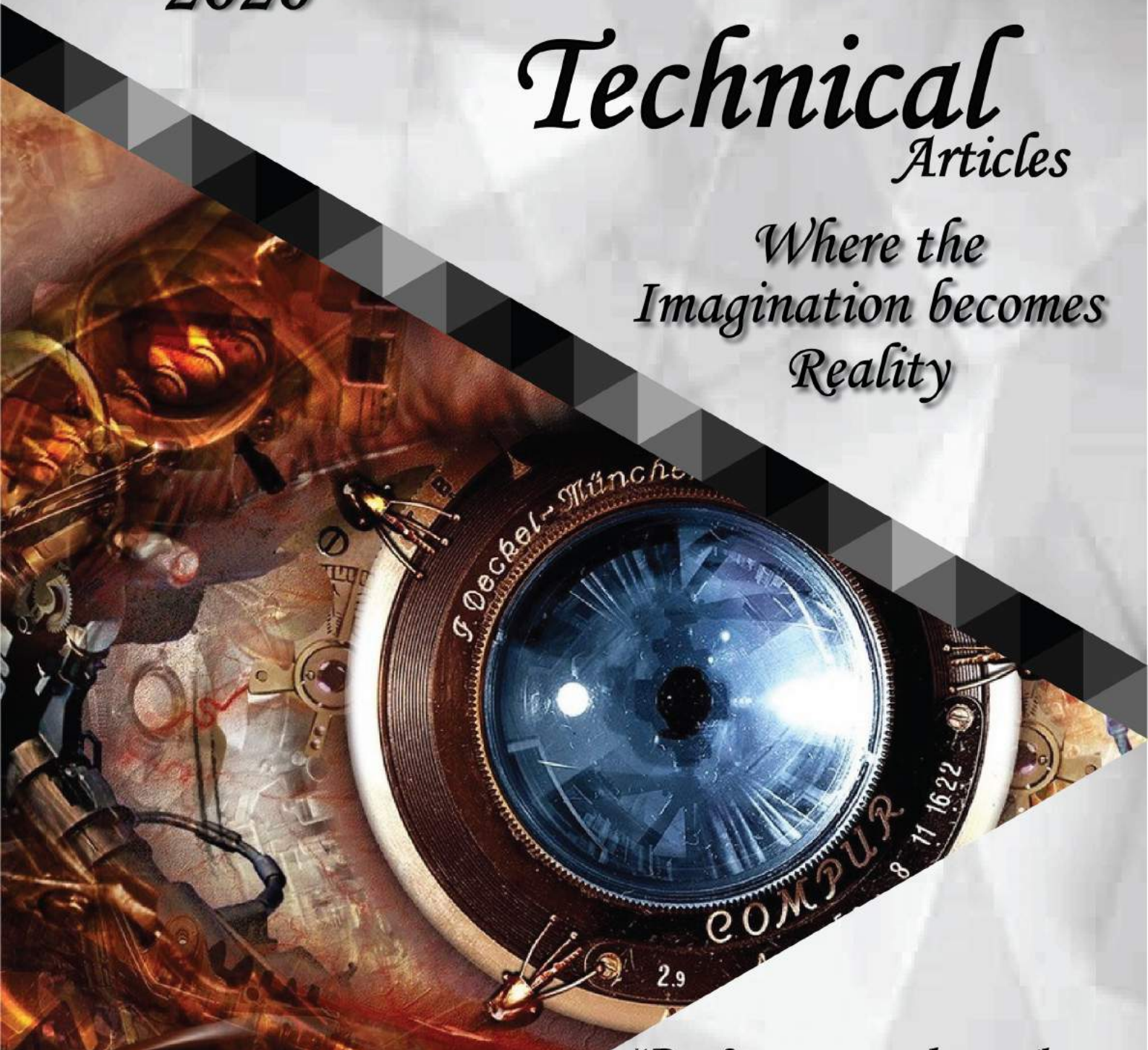
(1) Avoid contact with the rodents.
(2) Washing hands on a regular basis.
(3) Removal of garbage from home.
(4) Use protective measures like masks and eyewear.

Esha Adhikary
AEIE, 2nd Year

Breeze 2020

Technical Articles

Where the Imagination becomes Reality



"Perfection is achieved, not when there is nothing more to add, but when there is nothing left to take away."

- Antoine de Saint-Exupery

EMOTION SENSING TECHNOLOGY

Emotion is a mental state associated with the nervous system brought on by chemical changes variously associated with thoughts, feelings, behavioural responses, and a degree of pleasure or displeasure. Reading and understanding emotions can lead to wide-ranging opportunities. Emotion sensing technologies are being widely used in many applications to effectively understand the users' mood and use that information to do something productive. EMOTION SENSING TECHNOLOGIES can be used in various fields such as personal robots, driverless cars, educational software, consumer electronic devices, video games etc and is on the verge of becoming the next big thing.

THE TECHNOLOGY INVOLVED:

SKIN CONDUCTANCE SENSORS:

Skin conductance (SC) is an index of sympathetic nervous system (SNS) activation and emotional arousal. To measure skin conductance, a small electrical potential is applied between two electrodes strapped or taped to the palmer side of the hand, and the amount of current conducted between the electrodes is measured. It is generally accepted that SC varies directly with the amount of sweat secreted by the skin and indirectly with the number of sweat glands that are activated by the SNS. Skin conductance sensors are being widely used by psychologists, therapists in clinics and hospitals. The IoT is implementing this in wearable devices like wristwatches. The sensors allow gathering of data on heart and breathing rates, blood pressure, skin conductance and temperature to accurately gauge a person's mood.

The advantages include:

1. Can be easily fabricated.
2. Cheap

With such modern devices available, users can now track and evaluate their physical condition, mental health, access their reactions to various stress-inducing situations and learn to cope effectively with anxiety, depression and stress. Breathing rates, facial expressions, eye movements, voice intonations, are also taken into account and analysed. This also enables the user to learn better ways of coping with emotional stress. Most importantly, these do not require the installation of expensive hardware. It works with simple recognition software or some additional code on computers.

CURRENT DEVELOPMENTS:

1. University of South Wales, Sydney has developed a garment that lights up in different ways according to the users' mood.
It allows the user to communicate non-verbally. Sensors in the garment detect muscle tension, pulse, breathing rates and the physical information is converted to coloured light.

2. Some of the world's famous coaches, teams, and individual athletes are using headsets developed by SenseLabs.Inc, the USA which has dry sensors that assess brain performance.

3. AUTO EMOTIVE is a project of MIT'S Affective computing group which is based on exploration of the potential of emotional connection to machines with humans.
Their aim is to implement mood recognition technology in cars to improve the driving experience.

APPLICATIONS OF EMOTION SENSING TECHNOLOGY:

1. Emotion sensing can be potentially widely used in a multitude of fields like robotics, diagnostics, automotive, education, Improving workers conditions etc. Healthcare sectors are the keenest to adopt the use of such technology.
Car manufacturers are exploring its use to detect the drowsiness, mood and emotions of the driver to ensure road safety and a safe journey for everyone on the road.

2. Emotion sensing has thus come a long way in understanding human behavioural patterns.
It has changed the way human emotions are perceived and is certain to give rise to path-breaking discoveries for the benefits of mankind in the near future.

Sreyashi Bandyopadhyay
AEIE 2nd Year

LiFi

https://scienceclubhitk.blogspot.com/2019/08/the-life-changing-lifi.html?m=1

Click the link

Avinash Kumar Singh
Aeie 2nd Year

The Changing Landscape of the Automobile Industry

The automotive industry has remained relatively same and untouched, in spite of the innovations for almost a hundred years. This is defined by the heavy dependency on hydrocarbons for fuel and the monopoly the legacy automakers like Ford, GM, BMW, Toyota and VW has had over the market. But starting last decade, the 2010s, a revolution has taken over the market by surprise. Although many had seen this revolution coming from a mile way, the industry leaders didn't take notice, and left it for disruption. The revolution referred to here is the EV revolution. The industry's pivot away from Internal Combustion Engines (ICE), and the societal embrace of the electric vehicle is becoming more apparent by the day.

And leading the revolution are companies like Tesla, who have recently beaten out Toyota to become the most valuable car maker in the world in terms of market capitalization. So why has it taken so long, since 1910s, when Henry Ford changed the world travels and manufactures automobiles, for us to shift to electricity?

To understand the reluctance of the industry to embrace electric cars is twofold if explained in the simplest of terms. One was the technology. Battery technology is difficult and very expensive. As the ICE was a proven success the companies' reluctance in investing in something completely new and unproven was not completely flawed. The second is of course the incentive and profitability of the petroleum industry. Petroleum was and still is one of the most lucrative businesses ever, and where goes the money, there go the greedy.

The recent revolution of EVs have been a difficult terrain, and came with challenges not only from the industry but from the consumer as well. The powertrains and battery technology are a very difficult terrain to traverse, and the initial distrust from the public was very much valid. The battery technology was almost left untouched for more than 50 years, and they were very inefficient. The innovation of the EV companies have all been in the battery front, as the car designs and the basic built is still very same.

The recent innovations in battery technology have made the electric car revolution possible. The major innovators in this field have been of course Tesla and companies like LG Chem, and CATL who are steadily improving the battery technology by increasing their efficiency and moving away from highly polluting constituents such as cobalt to lithium. Another major issue with the batteries was the energy density, which bluntly put is the weight to energy output ratio of a battery. Batteries of old and even the commonly used AA or AAA batteries have horrible energy densities and they degrade very fast. The innovation has been slowly and steadily progressing in these fronts for the last decade, and recently Tesla had announced its Million Mile Battery, which will potentially show no degradation of the battery for more than 4000 charging cycles.

The industry is steadily renouncing the ICE car for EV, and even the big legacy automakers such as Ford and VW re starting to invest billions towards transitioning to electric vehicles. This and the growing worldwide effort to switch to sustainable sources of energy, combined with the public confidence in electric cars, mainly credited to the incredible cars with long ranges that have been coming out of the new players in the market, is changing the industry, that has been stagnant for a very long time, for the better.

Bondhu Dey
AEIE 2nd Year

Stone Age to The Era of Smart Sensing and Beyond

Human beings from the very beginning of life have been tweaking the natural abundance to make life easier on the earth. We, sitting in a room enriched with a variety of gadgets like AC, Fans, Lights, T.V, Music System, Smartphone, Laptop, etc., think of the future of technology. Already floating over the swarms of invisible electromagnetic waves, we think if this ain't the peak of technology, then what it is. Once this idea ticks, we start thinking, How did we use to communicate, 10 years ago? How did we travel some 100 years ago? How we dealt with pandemics some 1000 years ago?

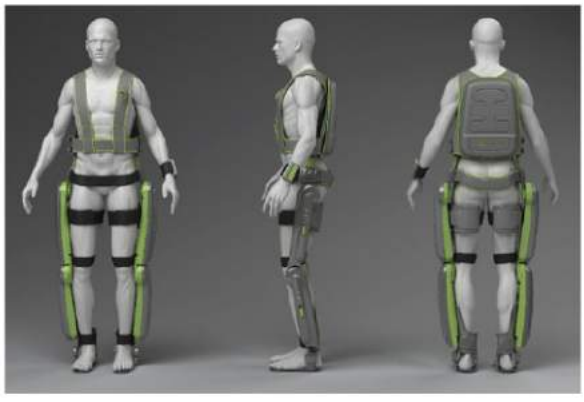
Hereon we start to think, how it started, the complete evolution of mankind, the discovery of wheels, the discovery of fire, the discovery of metals, and finally the human civilization. Human's life & civilization have been heavily modified with technology. The discoveries weren't sudden, it went through a gradual process of development. The discovery of metals being the greatest boon to the technology followed by the element's and finally, the hovercraft of the modern era, "SEMI-CONDUCTORS" Along with millions of research, discovery, and invention these Semi-Conductors were turned into computational devices, further scaled up to a key of pandora box, "THE COMPUTER".

Now, these two magical inventions "SEMI-CONDUCTORS" & "THE COMPUTER" changed the ways we used to visualize our lives society, and the civilization, equipping us with better connectivity and access to information. Furthermore, we started harnessing the unique properties of materials and their natural response to the change in the environment. Adding up to the list, we discovered another generation of revolution, what we call "SENSORS". Overtime we tweaked more and more materials building a diverse class of sensors that could be used to measure all the major physical changes, Temperature, humidity, pressure displacement, and many others. But again, we think why we are not using the usual mass damper system to calculate the orientation of our mobile phone? Why we are not using LVDT? Why we are not using LDR as a proximity sensing device in our smartphone?

Our intuition and necessity made us to "Invent", "SMART SENSORS". They served the same purpose as our conventional sensors did, but now they become microdevices with an interfacing circuit housed inside a chip of micron size. This revolution made the advancement of smart gadgets possible for mankind. Followed by countless discoveries, inventions, modifications, and research we are finally surrounded by the waves of digital data streams produced by these devices. Now we are in a condition to think, what's next? The answer is "SMART ACTUATION" the upcoming era will be governed by these smart actuators having the capability to connect with other devices. With such devices, we can think of a complete smart environment like smart offices, smart classrooms, smart farms, etc., all around us, as we have been watching in science fiction movies. Next time whenever we'll be unlocking our phone via the fingerprint sensor or commanding Alexa to "Turn on the Lights", we should be thinking of the changes in our lives due to technology and certainly, it's a dynamic and fast-moving subject to predict it precisely.

Kumar Harsh
AEIE 3nd Year

Powered Exoskeletons



Powered exoskeletons are wearable mobile machines powered by a system of electric motors, pneumatics, levers, hydraulics, sensors or a combination of technologies that allow for limb movement with increased strength and endurance.

This technology is developing very fast and is already in use in many fields. People with movements relateddisability will be able to move very easily.

Precision will be increased in surgeries. Developing a full body suit that meets the needs of soldiers has been challenging, but new and advanced designs with improved technologies and softwares will definitely benefit the military, police, fire-fighters later on. Modern Industries directly use these kinds of machines for efficient business.

Though it makes you stronger, run faster, jump higher, still one of the biggest challenges engineers face is power supply if they are to be worn in the field.

They risk explosion, might require frequent charging. Yet hydrogen cells have been used in some prototypes. Other challenges are that they should not be heavy, joint flexibility should mimic human movement flawlessly, the algorithms controlling power and modulation should be highly efficient, adaptation to user size variations.

This technology is not user friendly yet but lots of private companies and governments as well have started to invest more for research purposes. Powered exoskeletons date back to 1890 which used energy stored in compressed gas bags to assist movements made by Nicholas Yagin.

In 1917 Leslie C. Kelley developed pedometer which operated on steam power with artificial ligaments acting in parallel to the wearer's movement.

Lastly this technology will definitely help make this planet a better place to live.

Souvik Naskar
AEIE 2nd Year

Bio-Mimicry- When Nature Is The Best Teacher

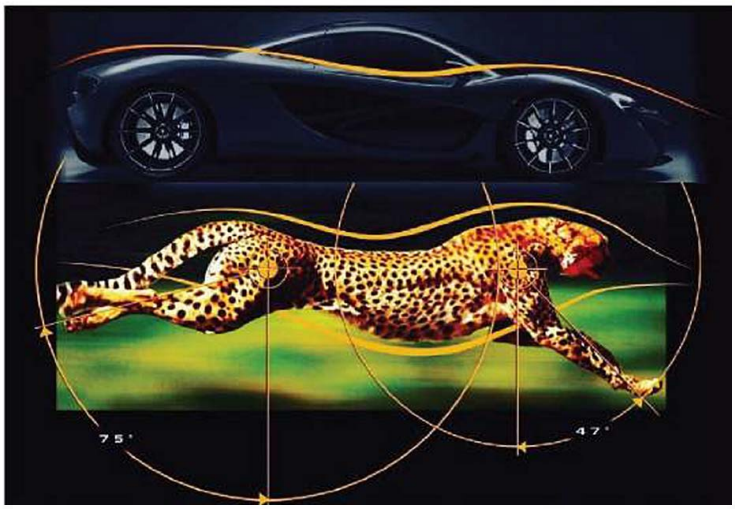
Ever marveled at the unending mysteries of nature? How everything is in perfect coordination all around, how even the tiniest of insects build up their sturdy little homes, how birds travel hundreds of miles to deal with season changes and how perfectly synchronized everything is around us.

We are just one among a billion different species, who call this planet our home. It would be rather unjustified to assume ourselves the most advanced, when a huge number of innovations and technologies we see around us today has been inspired by nature. Nature has been lending us her blueprints time and again, for the benefit of mankind and this has given rise to a whole new field of study- "BIO-MIMICRY".

In a nutshell bio mimicry involves taking inspiration from nature, its processes, models and systems to solve problems faced by mankind by mimicking nature's time tested strategies. A lot of new innovations has been heavily borrowed from nature, including baobab tree inspired houses, blue whale inspired antibacterial surfaces, houses that collect water from fog inspired by certain desert animals and at last the kingfisher inspired bullet train.

Bullet trains have been operating in Japan since the late 90s. As they each very high speeds of about 320 kmph, a cushion of air was building up in front of it causing loud sonic booms which disturbed the people living nearby and also disrupted the lives of animals living nearby. Among the team of engineers hired to solve the problem, was a birdwatcher. He remembered that kingfishers could travel from one medium to another without making a sound and thus reasoned that making the front of the bullet trains similar to the kingfisher, which has a pointed mouth, could solve the problem. His ideas finally saw the light of day and indeed the problem was eliminated and as a bonus, the trains now consumed 15% less fuel as the front had been made more streamlined.

Another wonderful example would be the design of screens inspired by peacock feathers. When we look at the bright feathers of a peacock, we see a myriad of purple, blue, green hues which is due to the presence of certain structures in the feathers that permit them to only reflect back certain colors to our eyes. San Diego zoo in association with Qualcomm has come up with a brilliant design for device screens which has an internal structure that only reflects ambient light to produce colors. The colors are formed by reflecting and not produced by the screen itself.



So, these type of screens use less power than the ordinary LCD screens. Spider webs have been intriguing researchers for a long time due to their remarkable properties. They have some special characteristics which make them almost weightless but at the same time very strong.

The molecular structure is such that even when a strand of silk is damaged, the damage is localized and the rest of the structure remains unharmed. This remarkable property has inspired many architectural designs like suspension bridges, arachnid inspired human shelters, glazed glass domes etc.

These structures are unusually strong and less prone to damage.

Due to the rapid development and urbanization all around us, unknowingly we have been depleting our natural resources. But solutions to all these problems are fortunately around us already.

Bio mimicry offers us sustainable solutions and thus, is the key to solving global problems in the future.

"Because when we take a look at what is truly sustainable, the only real model that worked is the natural model."

Sreyashi Bandyopadhyay
AEIE 2nd year

Check out My Blog About Wormholes

https://scienceclubhitk.blogspot.com/2019/09/question-what-are-wormholes-are-they.html?m=1

Click the link

Avinash Kumar Singh
Aeie 2nd Year

A STUDY ON USE OF "MAGNETIC PARTICLE SPECTROSCOPY "IN COVID TESTING

(Based on different research papers published at IEEE forum)

We are receiving cases close to a lakh patients per day and our economy had seen a GDP decline of about 24%.So in the current circumstances we need a quick detection mechanism which is easily available for the use of masses.

We have using real time reverse transcription polymerise chain reaction (rRT-PCR) tecnique which is fabricated on MEMS and works on the principles of microfluids- based on research published by "kang-yi-lien" and other chinese scientists in 2007 at IEEE forum.

In the paper itself it is written it needed to be performed carefully and it gives sufficiently false positives. And it requires 5-6 hours to give results. With the new system as presented by a group led by professor "jian -piang wang "to the IEEE spectrum it is relatively cheap, easy to use and quick to deliver results.It's a portable platform based on magnetic particle spectroscopy (MPS) that allows for rapid, sensitive detection of SARS-CoV-2 at the point of care.

MPS is a versatile platform for different bioassays that uses artificially designed magnetic nanoparticles that act as magnetic tracers when their surfaces are functionalized with test reagents such as antibodies, aptamers, or peptides. Imagine them as tiny probes capturing target analytes from biofluid samples.

For COVID-19 antigen detection, nanoparticles are functionalized with polyclonal antiboies to two of the four structural proteins that are components of the coronavirus (nucleocapsid and spike proteins). The antibodies allow the nanoparticles to bind to epitopes, or receptor sites, on these particular proteins. The more binding that occurs, the greater the presence of the virus.

The MPS platform's job is to monitor and assess the real-time specific binding of the nanoparticles with these proteins.

The quantity or concentration of the target analyte - in this case, the aforementioned proteins indicating the presence of coronavirus - directly affects the responses of the nanoparticles to the system's magnetic field.
The magnitude of the difference in their behaviour before and after the addition of the biofluid sample tells the tale.

Because the biological tissues and fluids are nonmagnetic, there is negligible magnetic background noise from the biological samples. As a result, this volumetric-based immunoassay tool is not only uncomplicated, but also accurate and effective with minimal sample preparation. How it can be used?

MagiCoil Android app that processes information from the device's microcontroller in real time.
And crucially, it also guides users on how to conduct a test from start to finish. The user interacts with the MPS handheld device using their smartphone, which communicates with the device via Bluetooth. Testing results are securely transmitted to cloud storage and could be readily shared between a patient and clinicians.
To run a test, the user begins by inserting a testing vial into the device and waiting as the system collects a baseline signal for 10 seconds. Then the user adds a biofluid sample into a vial and waits again as the antigen and antibody bind for 10 minutes.
The system will automatically read the ending signal for 10 seconds, then display the results.

Avijit Sharma
AEIE 3rd Year

PS Motors

PS Motors is an Youtube Channel created by **Parambrata Saha and Sagnik Ghosh**, Student of Heritage Institute of Technology, 3rd Year from AEIE department, to showcase every latest cars in India (Kolkata), by reviewing them and discussing about the every technologically advanced features, of it.
This is the channel to know every thing about, various types of cars in the present market.

They visit all around Kolkata to portray, the most appealing cars, and for every budget sector.
Please Support Us by subscribing to your YouTube channel.

Youtube Channel- https://www.youtube.com/c/PSMotors

Click The Link

Achievements:

1. have been congratulated by MotorOctane, a renowned Youtube channel in the same filed, for our work.

2. We have been invited by Topsel Toyota for the events and launch parties of there new cars.

Time Capsule

Today it is possible to directly communicate with people hundreds of years in the future. All we need to do to write a message, add a few objects and records that to convey the message of something about the time we're living in and buried in a box somewhere for future generation to unearth. That's why we make a time capsule as a deliberate method of communication with future people and to future archaeologists, anthropologists or help historians. Time capsules are sometimes cr ated and buried during celebrations such as a world's fair, a cornerstone laying for a building, or at other ceremonies. The time capsule was first laid in 1973 by then Science and Technology Minister Toh Chin Chye with the foundation stone of the Science Centre Singapore. But so many items were added that the original was replaced with another container. The stainless steel capsule has at least 800 items in it, preserved in nitrogen.

Famous Time Capsules in the World:

- Samuel Adams and Paul Revere Time Capsule: It is the oldest known time capsule from 1795(USA).

- The "Century Safe": The world's first planned time capsule was established at Philadelphi Centennial Exposition (USA) in 1876. It was opened and resealed in 1976.

- The Crypt of Civilization in Georgia: It was built around 1940 at Oglethorpe University in Brookhaven, Georgia and is scheduled for opening in the year 8113 AD. It is a project to preserve all human knowledge and was the brainchild of Thornwell Jacobs, also known as father of time capsules.

- The Voyager and Voyager II Spacecraft: They are currently circling on the edge of our solar system. These capsules were created by NASA to be seen by future generations.

Time Capsules in India:

- Outside the Red Fort: This was placed underground in 1972 by the then Prime Minister Indira Gandhi, was dug out by the subsequent government in 1977. It raised a contrversy as it was said to glorify Gandhi Nehru family in Indian History.

- At IIT Kanpur Campus: This time capsule was buried 6th March, 2010 containing details on IIT Kanpur in the form of documents, photographs, and films.

- At the Alexandra Girls' English Institution, Mumbai: It was set up in the 19th century and is scheduled to be opened in 2062. It contains information on the school.

- At Jalandhar's Lovely Public University: It was buried in January 2019 and contains 100 items that represent modern-day technology in India.

Significance

Time capsules are the next level method to inherit the history in a delicately organized way to the future generation these are the certain representatio n of present era , also we can extend our hand to communicate with aliens of galaxy by sorting and storing the data in spacecrafts.

Criticism:

• Most intentional time capsules are filled with a lopsided view of history. They are often politically motivated and glorify the people who planted them.

• They can't be regarded as facts and are not very reliable. The information in time capsules has to be verified with other sources of information.

• Many time capsules which have been unearthed were filled with junk telling little about the people of the time.

My obsession towards the time capsule:

It's quite mesmerizing that it's been a priceless opportunity to prevent the present for decades towards our grand legacy.

And specially the devastating situation of world by covid -19 we have been faced, we never expect such scenario never come any future generations of ours, and the survival strategy and preventions should convey to our future generations how we people of entire world held ourselves against "Chinese virus".

Though we are unable to make time machine to travel in our past but we can certainly set an example of time travelling for our future living being through Time Capsules.

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Thank You

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