AMPERE

March 2021

Filter the noise , amplify your confidence

Presented by

ECE Department

Heritage Institute of Technology of Technology

VISION

The degree holders of the department will carry the image of the institute and the department in India and the world through their commitment and success. They will prove themselves to be good, sincere and successful professionals and teachers. They will prove themselves as good, caring and responsible citizens.

MISSION

Students with degrees from Electronics and Communication Engineering (ECE) Department of Heritage Institute of Technology will :-

- Acquire specialized knowledge in the desired domains.
- Be able to analyze a problem in the given areas and be able to solve it in efficient manner.
- Have confidence and knowledge to start new business activities and show entrepreneurship skills.
- Develop passion for more studies and R & D.
- Inherit leadership qualities for society and workplace.

FROM THE HOD'S DESK:

We have lived through a traumatic year in all its senses - we have lost our near and dear ones, we have stuttered towards our career goals and we are yet to resume our normal lives. The students have missed the valuable guidance from the teachers. They have not been able to perform the experiments in their practical classes with tips from the technical assistants. Still, life must go on and we have shown remarkable resilience and fighting spirit to overcome the pandemic situation. One proof is the publications of our very own AMPERE in time and with precision.

I am really impressed that the editorial board has been performing all the functions with impeccable timing. I have been receiving reminders to execute my responsibility from them and it is a matter of pride for me that such students and teachers belong to my department.

I am sure that there will be myriad contributions from all members of the ECE department. Students, in particular, should be the leading the process. I wish AMPERE all success for the forthcoming issue and all future publications.

Prof. Prabir Banerjee
Head, ECE Department

MENTOR'S MESSAGE

Message from Prof. Sayantani Datta:

Congratulations to the entire editorial team of Ampere, for your hard work and dedication that has resulted in the publication of the March 2021 issue. Your wide spectrum of creative skills ranging from writing to editing and even in designing the magazine always make me astonished and delighted. I express my considerable appreciation also to all the authors of the articles in this magazine.

MESSAGE FROM THE EDITORIAL BOARD:

"Do not go where the path may lead, go instead where there is no path and leave a trail."

-Ralph Waldo Emerson

The enormous response from the contributors and the motivation from our mentors encourages us to take this magazine a step ahead. We are delighted to present "Ampere" as a platform for the students of our department to showcase their talents and present their reports and thoughts on diverse matters happening in the world in front of everyone. We have always tried to give a column to all kinds of article . Our new edition includes the categories of electronics, science and technology, creative writing, contemporary, sports, paintings and photography and this time we have introduced a new section in which we have given place to miscellaneous articles. We thank our mentors Prof. Prabir Banerjee (HOD, ECE Department) and Prof. Sayantani Datta for encouraging us throughout. We also thank the contributors and students of ECE Department who have made this magazine possible. We hope this edition can match your expectations.

Welcome to Ampere 5th edition.
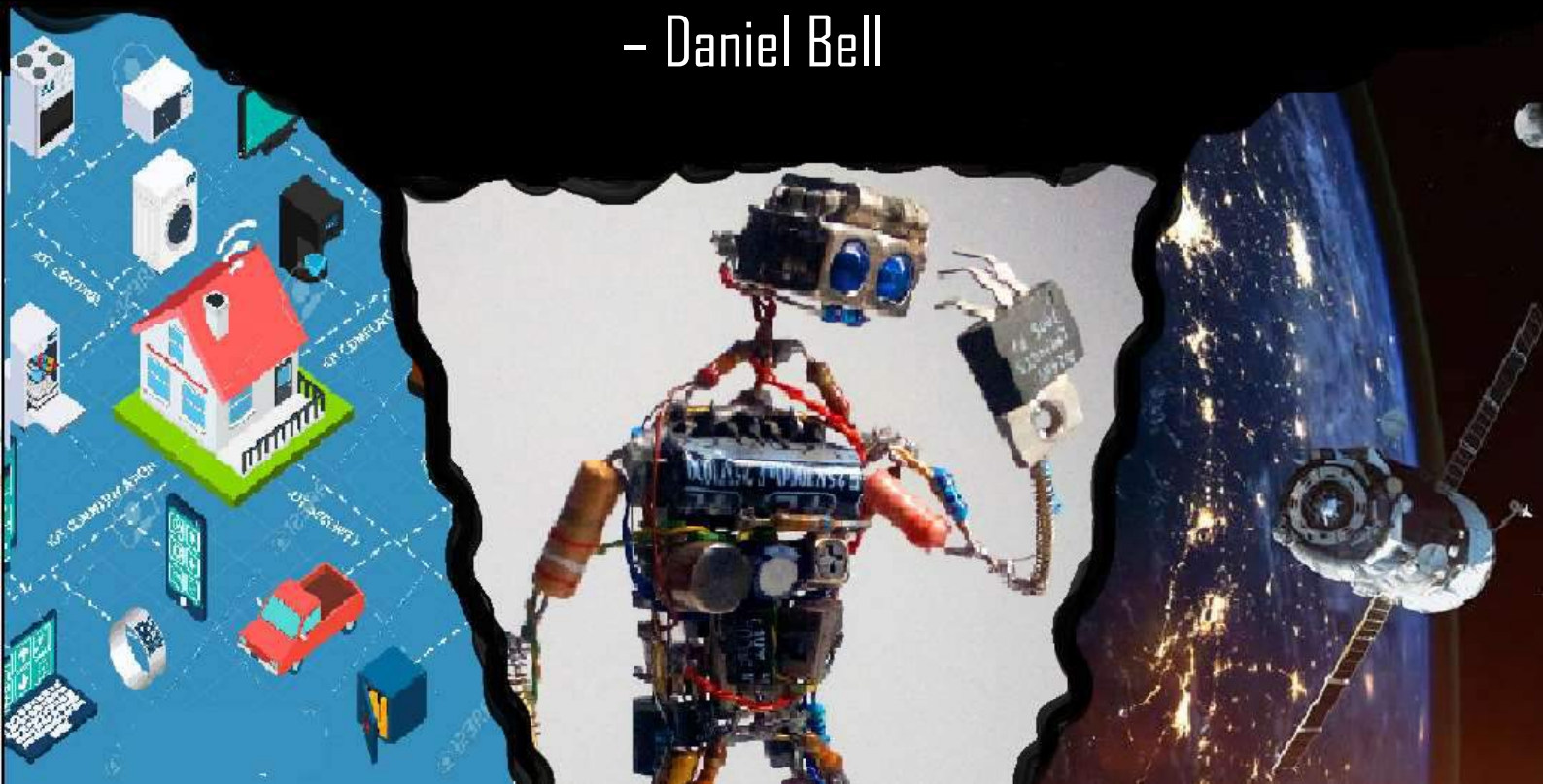
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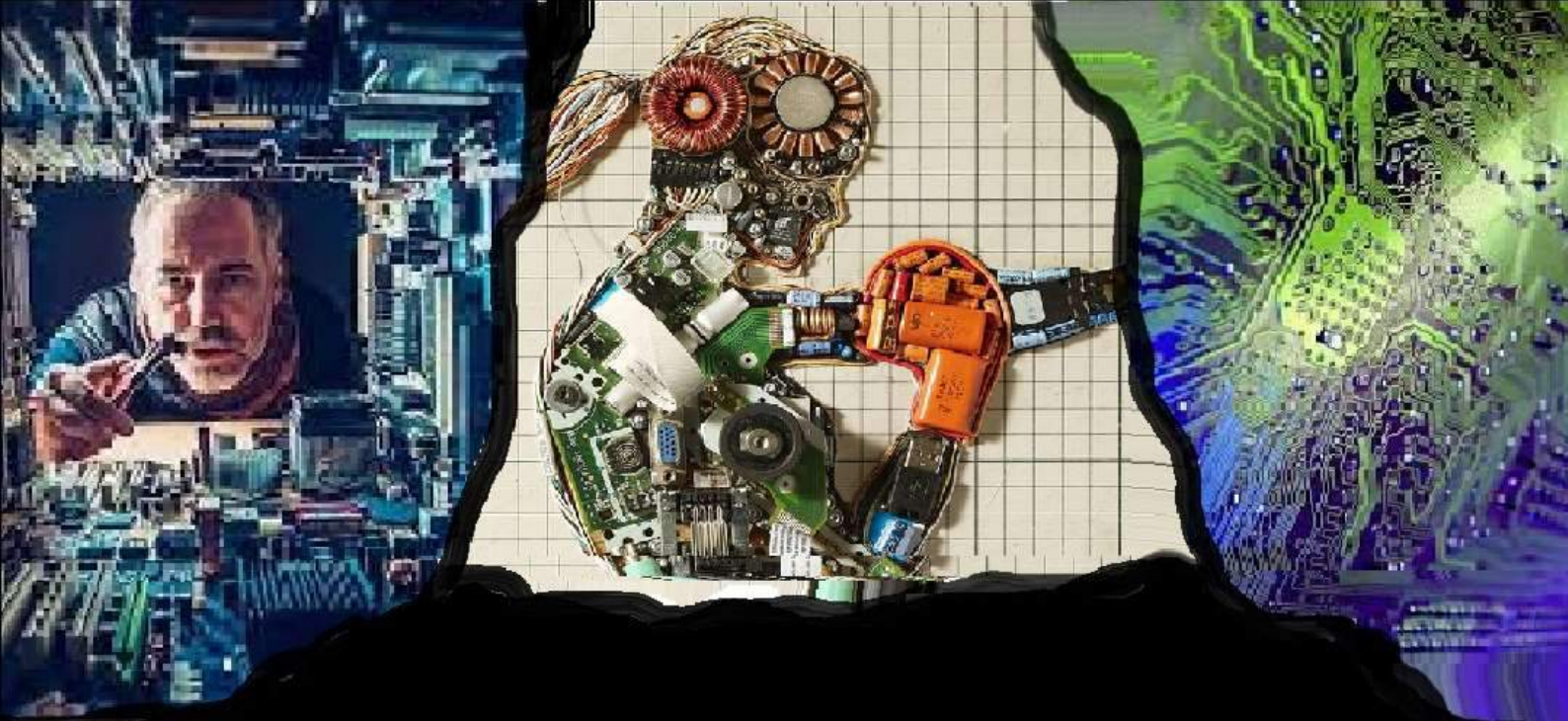
ELECTROSPARK

"Electronics and Technology like art is a soaring
exercise of the human imagination."
– Daniel Bell

VANET- networks for the future with major challenges

We have seen a phenomenal rise in the application of radio frequency signals in the last 3 decades or so. The ease of connectivity and total freedom of mobility are two main reasons for the proliferation of wireless communication. The challenges and issues facing successful and reliable wireless communication are many- the interference from different transmitters, the fading due to phase delays and jitter are some of the most critical challenges.

When a receiver is trying to detect the symbols sent by a far transmitter, the most important parameter is the signal-to-noise ratio (SNR) at the receiver. The receiver circuit can detect a 1 or 0 correctly only when the SNR is more than the threshold value. For cellular type networks, the SNR has to be more than 18dB for the network to operate reliably. The scientists and the engineers have worked wonders to improve the performance of radio networks over the last 30 years or so.

Quite a few mobile radio networks have been developed. Of course, cellular systems are the best examples of mobile-to-mobile communication. In cellular networks, we see a master-slave configuration. There are networks, where we will see all-master deployment. One example is Ad Hoc wireless networks. Both the types have their own strengths and weaknesses.

We must have heard about intelligent, unmanned vehicles and drones. Here, we will have some brief idea about land vehicles only. The networks developed for vehicles are abbreviated as Vehicular Ad

Hoc Networks (VANET). Some standards have been set already but there is tremendous scope for improvement. Therefore lots of research activity is going on in the domain. I am going to present a glimpse of a few problems which are unique to VANETs.

In the highly dynamic vehicular environment, congestion control is essential, especially with regard to safety messages. Although a dedicated spectrum has been allocated for vehicular communications, the European 30 MHz Intelligent Transportation System (ITS) band (with a possible extension to 50 MHz) or the US 75 MHz Direct Short Range Communication (DSRC) band still represent a scarce resource and need efficient mechanisms in order to be optimally used under high vehicular density.
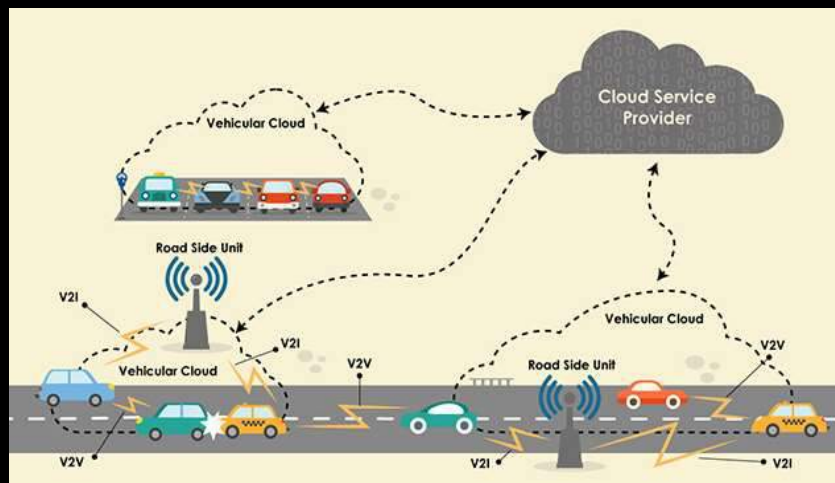
Congestion control mechanisms received a lot of attention from the VANET research community and the most relevant studies in this area are summarized later. The standardization bodies also recognized the importance of a decentralized congestion control framework for V2V safety communications, and ETSI published a series of technical specifications in this area in July 2011 [EUR 11]. In the US, the Society of Automotive Engineers (SAE) is also developing a standard with similar objectives, SAE J2945.1, currently in a draft phase.

The standards from the IEEE 802.11 family provide multi-rate capability at the physical layer, but without specifying a particular approach for data rate adaptation. In wireless communications, a more complex modulation results in a higher data rate, but it also requires a higher signal-to-noise ratio (SNR) at the receiver in order to be correctly decoded. In the continuous fight for increased bandwidth, the search for an efficient data rate control solution in the very lucrative WLAN industry stimulated the research in this area.

In broadcast safety communications, solutions using feedback from the receivers are clearly unsuitable. This is because if the receiver is in any trouble, it cannot send any feedback signal to the corresponding transmitter. Therefore, the data rate adaptation mechanisms proposed for vehicular safety messages follow the classic path of algorithms based on historical data. These are the two critical areas and there are quite a few others like optimum transmission power, MAC layer contention etc

Prof. Prabir Banerjee
Head, ECE Department

Paper battery – A generation of environment friendly Battery

A battery is an electrochemical cell that can be charged electrically for providing a potential for power or electrical discharge when needed. A battery generally has 3 parts i.e. an anode, a cathode, and an electrolyte. The advancement in technology is developed environmentally friendly and more flexible batteries such as paper batteries.

A paper battery is The flexible and thin energy storage battery . It is often used as a capacitor. The battery can be produced by merging the nanotubes made of carbon and nano-composite paper made using cellulose. This battery consists of property of a battery – high-energy storage capacity and property of super capacitor – high-energy density and thus, it produces extreme power.

Steps for the Construction:

Step 1: Apply black carbon ink on a cellulose based black paper .

Step2: Spread the ink applied on the paper

Step3: Laminate a thin film over the cellulose surface

Step4: Heat the cellulose paper for 5min at 80 degrees C

Step5: Peel off the film from the substrate

Step6:The electrodes of paper battery are formed by the film. The electrolytes LTO and LCO are

connected to different the films

Step7: Check the functioning of the paper battery by connecting battery terminals properly to the LED.

Working Process:

Internal operation of the paper batteries is similar to the conventional batteries with each battery generating about 1.5V. In some of the paper batteries, carbon nanotubes act as cathode, the metal is the anode and paper is the separator. Chemical reactions between metal and electrolyte results in production of ions and between carbon and electrolyte results in production of electrons. These electrons flow from the cathode to the anode through the external circuit continuously.
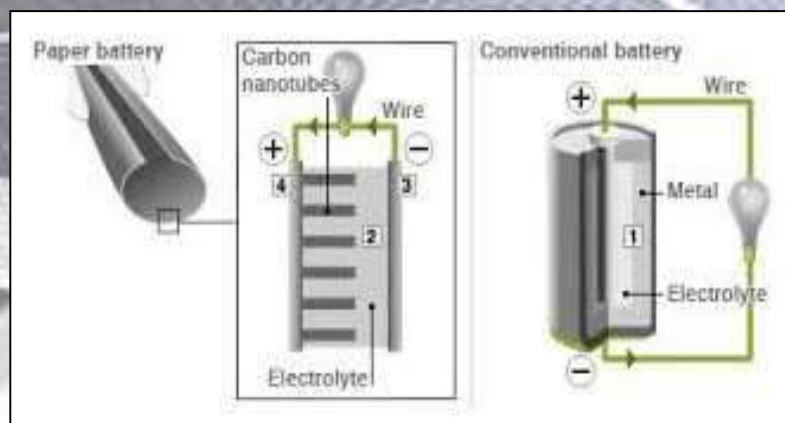
Applications:

• It can be used in electronics for charging various types of devices e.g. laptop, cameras, mobile phones, calculators etc.

• It can be used in wireless or Bluetooth devices e.g. mouse, keyboard, speakers, Bluetooth headsets etc.

• It can be used in different medical applications such as artificial tissues, cosmetics, glucose meters, sugar meters etc.

• It can be used in aircrafts and automobiles such as hybrid car batteries, guided missiles etc.

Advantages:

• They can be re-used and re-cycled by using the techniques of existing paper recycling.

• This paper batteries are rechargeable using all electrolytes.

• It is durable and can be operated in wide temperature range.

• There is no leakage problem because no leaky fluids are used in its design.
• For low resistance characteristics it does not overheat even under extreme conditions.
• It is a flexible and light in weight material.

Disadvantages:
• Paper batteries can be torn easily as they have low shear strength.
• Methods like arc discharge, CVD, ablation, electrolysis used in carbon nanotubes manufacturing are expensive and less efficient.
• They are harmful to human being when they are inhaled.

Suvojit Kabiraj
4th Year

AppleM1Chip

*"Give people wonderful tools
And they'll do wonderful things"*
-Steve Jobs

Introduction:

A new baby has been born in the Apple silicon, newborn baby by name but can adapt to any big processor in power, for many years apple has built an established platform in hardware-software optimization at world electronics and we all know that this amazing ecosystem of this company connects each of their smart devices.

To each other and their very smart in work. They've built a processor for each of their computing devices excepts the Macs for which they relied on Intel until now. But this year, Apple unveiled their own homegrown processor named Apple M1. It is the first ARM-based system on a chip (SoC) and is the first processor to be built on 5nm architecture. It was inspired by their ARM A14 chip. It is deployed in the MacBook Air (M1, 2020), Macmini (M1, 2020), and the MacBook Pro (13-inch, M1, 2020). Apple claims that it has the world's fastest CPU core "in low power silicon" and the world's best CPU performance per watt.

Architecture and Performance:

The M1 has four high-performance Firestorm and four energy efficient Icestorm cores, providing a configuration similar to ARM DynamIQ and Intel's hybrid Lakefield and Alder Lake processors. This combination allows power-user optimizations not possible with Apple-Intel architecture devices. Apple claims the energy-efficient cores use one-tenth of the power of the high-performance ones.

Rosetta 2 dynamic binary translation technology enables M1-equipped Products to run software built for Intel x86 CPUs. What this means is that all native x86 apps such as Adobe Photoshop can seamlessly run on the new M1 macs without needing any changes from the developer.

Product and Efficiency:
The M1 was welcomed with very positive reviews and recorded industry-leading performance and efficiency in popular benchmarks (GeekBench 5, Cinebench R2). The benchmarking methodology for single thread synthetic benchmarks was criticized as being flawed when comparing to simultaneous multithreading enabled x86 CPUs.

The MacBook Air (M1, 2020) and MacBook Pro (M1, 2020) are considered to be the fastest MacBooks ever produced by Apple with the MacBook Pro (M1, 2020) leading the field in battery life. M1 Macbook Pro clocked in at 14 hours for sustained video playback, an unprecedented feat in the laptop scene.

Conclusion:
Despite being groundbreaking in terms of efficiency, these are only the first generation chipsets. Hence a lot waits to be seen as these chips gets optimized and enhanced more in upcoming editions.

Abhradip Bhattacharyay
1st Year

Waterless Solar Panels Cleaning Robots UNICORN and SHREEM

Solar panels are known to sustain themselves for a long time without requiring much maintenance and effort. However, this is only applicable to areas receiving adequate rainfall throughout the year. Due to their inclined installation, rainfall washes most of the dirt, bird droppings, and dust settlement. But in dusty regions, or where the panels have stood for a long time, cleaning by rainfall is no longer enough.

In addition, manual cleaning is a risky and tedious job. Any exposed cable or a loose connection can lead to severe shock hazards. This is when professional cleaning services become a necessity to maintain the desired performance and keep accidents at bay.

To overcome these hurdles, start-up Aegeus Technologies in India has come up with intelligent waterless solar panel cleaning robots, namely UNICORN and SHREEM, with an aim to protect the environment and save precious water resources. Waterless solar panel cleaning is a new technology, which uses a dry cleaning technique to enhance the capability of solar energy harnessing system.

UNICORN is a smart robot with machine learning (ML) capabilities. It senses dust levels and cleans accordingly. It can also differentiate dust from bird droppings or panel breakage. It

features a rotary brush coupled with blower and auxiliary brushes to clean the panels. Unicorn can be set to operate at a fixed time of the day and week by using 'time' mode, or it can be operated based on the dust level when set in 'auto' mode. The fully automated system is ideally suited for both rooftops and ground mount farms, irrespective of the size and geography.

It sends a communication to the central monitoring station or designated mobile phone over GPRS when manual intervention is required. This intelligent robot can easily clean 400-800 panels per hour, depending upon the level of dust.

SHREEM is exclusively designed for rooftop solar projects. It consists of two sets of soft microfibre cloth brushes (axial and radial). Controlled airflow ensures dust is blown away from the panels efficiently. The radial brush also ensures it blows away any leftover dust from edges.

The robot weighs approximately 5kg, which makes it light and portable. It can clean around 200 panels an hour and comes with a backpack so that it can be carried from one location to the other.

In its basic version, the Shreem robot is Bluetooth enabled and can be operated using a mobile app. In case of large farms, it can be operated using an RF remote-operated controller.

Both robots use unique airwash technology to ensure there is no need for water or any harmful chemicals. The docking station monitors relevant weather parameters like rain, wind speed, etc. If the parameters are unsafe for the operation of robots, these continue to be in the docking station. The robots are powered by Li-ion batteries.

The docking station is equipped with a solar panel to charge the robot batteries when docked. There is no need for an external power supply or any cabling. The use of such technologies extends the life span of the panels, providing a payback of six to eighteen months, offering greater throughput, and increased efficiency.

Sakshi Agarwala
1st Year

NEURALINK – AN AI HUMAN

What will be your reaction when I say to you that your imagination can be directly transferred anyone without using any body parts? What will you say when I tell you that you can take backup of memories of your mind?

You will definitely say "How will that be possible? These things only happen in science fictional movies" .

But for your kind information, I want to tell you these things will be going to come in our life in just a matter of few days with the help of device named NEURALINK.

ABOUT THE INVENTION OF THIS DEVICE:

Two neurosurgeon PEDRAN MOHSENI and RANDOL NUDO had done research and got an idea of neuralink and then create patent in 2015. After that, it was brought by TESLA and SPACEX owned by honourable ELON MUSK in 2016. He said that this will a revolutionary technology which would be helpful for a paralyzed person. Since its founding, the company has hired several high-profile neuroscientists from various universities. By July 2019, it had received $158 million in funding of which $100 million was from Musk and was employing a staff of 90 employees.
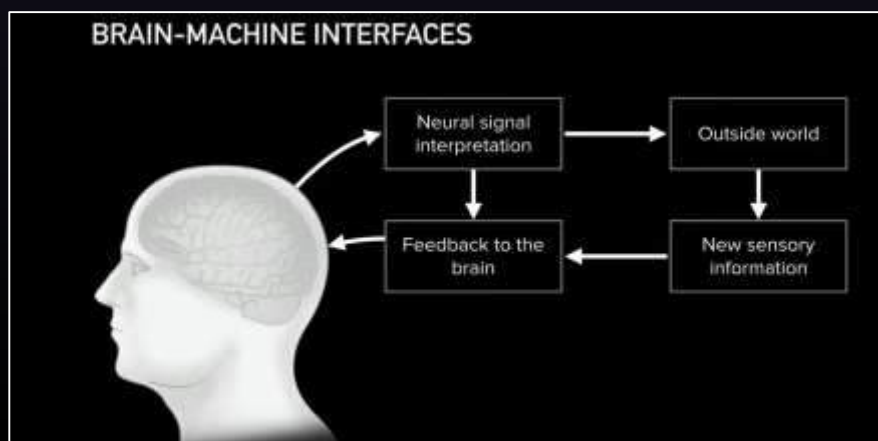
WHAT IS NEURALINK?.

NEURALINK is A type of device developed on the basis of BRAIN MACHINE INTERFACES BMIS that will be surgically implanted into brain and the from the help of it, we will be able to communicate with the machine and even control them. This will also beneficial to study the electrical signals in the brain and able to cure various medical problems.
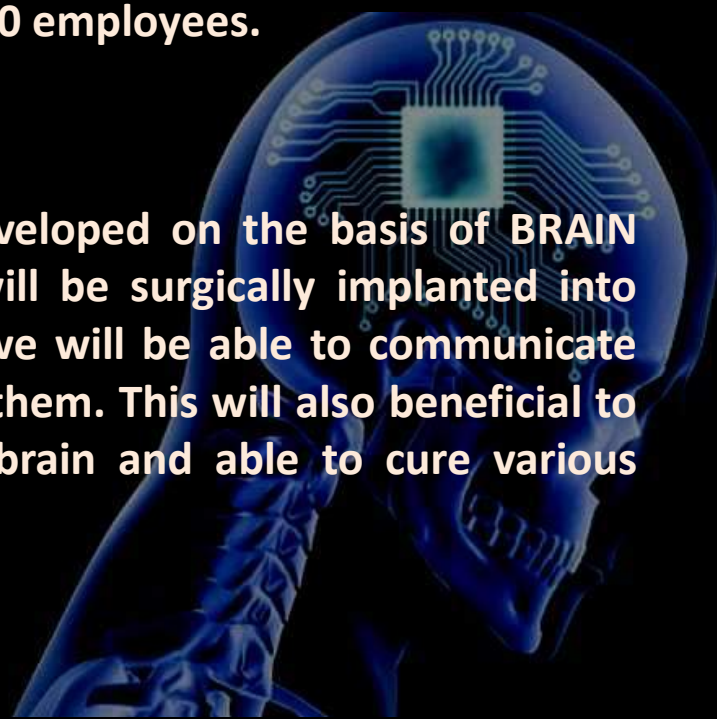
HOW DOES NEURALINK WORK?

The N1 consists of a 4mm square chip implanted into the skull. Attached to this chips are wires far thinner than a human hair, which reach out into the brain. These threads are placed to the important part of the brain and able to detect messages as they are circulating between the neurons recording each impulse and stimulating their own. According to ELON MUSK , the N1 is able to connect with 1000 different brain cells and that a patient might have as many as 10 N1 chips implanted. The chips connect wirelessly to a wearable device that hooks over the user's ear much like a hearing aid , and containing a Bluetooth , radio and the battery.

BRAIN-MACHINE INTERFACES

Neural signal interpretation → Outside world
Feedback to the brain ← New sensory information

HOW WILL NEURALINK BE INSTALLED?

According to ELON MUSK , The process of installation is quite complex and beyond the capability of even skilled human hands. This installation will be using its specially developed robots to carry out the quick and precise insertion of the device in the cortex. This robot will insert it into your brain using a microscope and the needles the size of 24 microns. These needles are so small even we can't spot them with naked eyes. Robots has been designed to ensure that the device is inserted without touching any veins or arteries. Each electrode will be inserted specifically bypassing any kind of blood vessels.
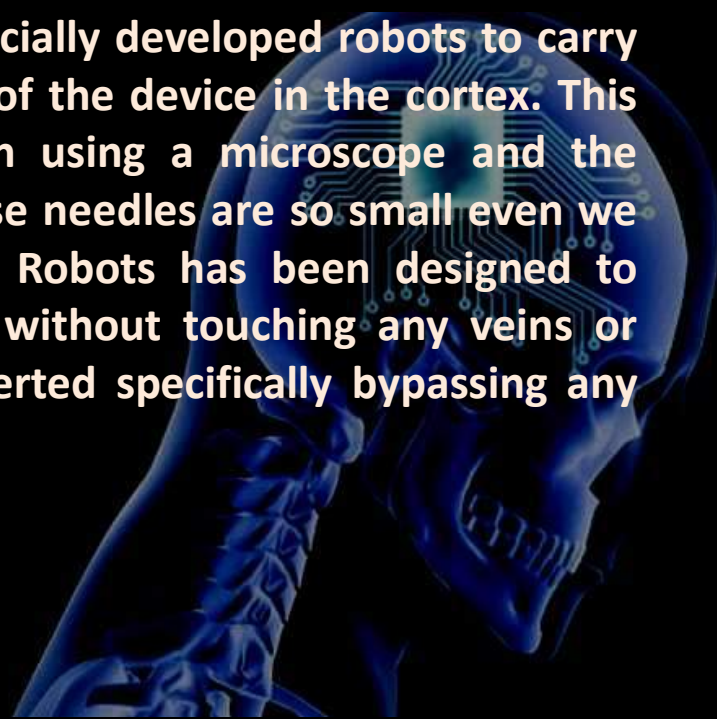
WHAT COULD HEALTH PROBLEMS BE TREATED USING NEURALINK TECHNOLOGY?

This technology could help treating neurological disorders which are caused because of the inability of the brain to connect with nerves around the body. These include not only *EPILEPSY* and *PARKISON'S DISEASE* , *b*ut also PARAPLEGIA and QUADRIPLEGIA following injuries to the spinal nerve. This technology will be very helpful for treatment of various types of disorders related to brain and spinal cord.

WHEN WILL NEURALINK TESTED ON HUMANS?

In 2019, Musk announced that the company was working on a "sewing machine-like" device capable of implanting very thin that is 4 to 6 μm in width threads into the brain, and demonstrated a system that read information from a lab rat via 1,500 electrodes. They had anticipated starting experiments with humans in 2020 but have since moved that projection to 2021 due to the pandemic.

MY OPINION

If the clinical trial on humans becomes a success, then definitely it will be the most revolutionary invention in the world of artificial intelligence and this will prove to be a boon for the neuro and spinal patient as they will get a new life. But this is going to be a very big and difficult project to work on.

Vinit Kumar
1st Year
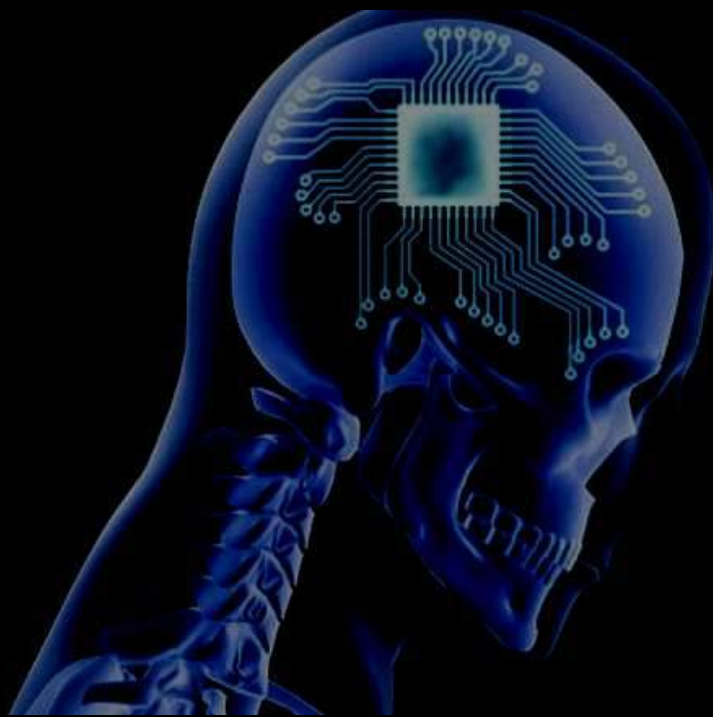
MY DRONE

WEIGHT LIFTING- My drone can lift 1kg external weight easily because of powerful motors installed in it.A single motor of Emax 2213 935kv with 1045 propeller can generate a maximum thrust of 840grams.

RANGE- We can fly this from a maximum distance of 1km with help of the FSCT6B 6 channel 2.4 GHZ transmitter. If we want to increase the range further , we can use FRSKY TARANIS QX7 24 channel 2.4 GHZ transmitter for that.This transmitter can provide an awesome range of 4km[max].

FLIGHT TIME- It can fly 10 -15 min if we are using a 11.1v(3S) 3000mah Lithium polymer battery and 25 – 30 min with help of 5000mah battery.

STABILITY- For flying properly and smoothly, There is a circuit board is installed at center of the drone generally we call this Flight controller or you can also call BRAIN of the drone. Here I have used APM 2.8 as flight controller. Flight controller mainly control the rotating speed of every motor according to needs . For improving the stability at another level I have used M8N GPS on it. GPS send the current longitude and latitude to the flight controller so the drone can hold its position in air.

GROUND STATION- I have used 433MHZ 100mw TELEMETRY for seeing all the live parameters of drone like remaining battery, ground and vertical speed, altitude, GPS location and many more. Telemetry is a device that can connect our drone to a laptop or mobile wirelessly. We can also control and fly the drone via this.

ADVANCED FEATURES- Sometimes it may be difficult to bring the drone back while flying . But here we can bring the drone by pressing a just single switch . Name of this function is RTL(Return To Launch), by sending this command , drone will come and land to its

launch position automatically. In case of battery law or connection lost from the ground station RTL command mode will be activated automatically by drone.

EXTERNAL WORK- For doing some external work by drone, like dropping something from it I use SG90 SERVO. This servos are also powerful it can produce a torque of 1.2Kg-Cm.

Recently I have successfully hoisted our national flag by using this servo.

Dipak Khushwaha
4th Year

eFUSE:
The self maintaining chip

Morphing usually refers to changing smoothly from one image to another by small gradual steps using computer animation techniques, often seen in video montages and movies. Chip morphing technology applies this idea of transition to a chip which can regulate and adapt itself to meet the system's requirements and changing conditions.

IBM's patented eFUSE technology has achieved this by combining unique software algorithms and microscopic electrical fuses to produce chips that can morph as per requirements. By dynamically sensing that a chip needs a tune-up, eFUSE changes the configuration and efficiency of its circuitry to enhance its performance or avoid potential problems. This autonomic capability is expected to be a real game changer.
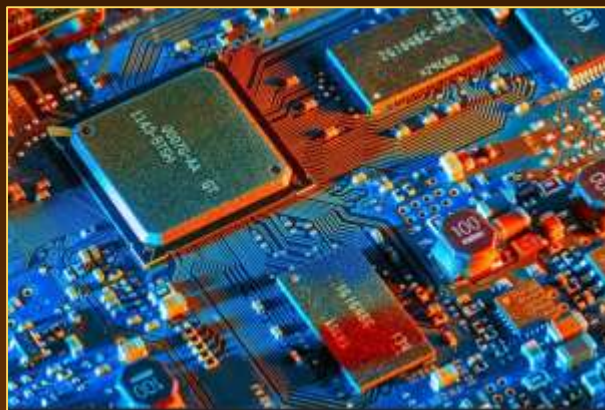

eFUSE can reroute chip logic , working the same way as traffic lights do. So by changing the flow by closing and opening different lanes, the chip can change into different forms. This also suggests that the eFUSE is capable of self-repair and doing its own maintenance. By detecting any imperfection in the functioning of the chip through constant self-monitoring, it can initiate corrective actions and fix itself.

It can throttle down its circuits or speed them up by controlling the appropriate local voltage. The secret behind eFUSE's creation is a phenomenon called electromigration. It is the process of transport of material caused by the gradual movement of the ions in a conductor due to the transfer of momentum between the conducting electrons and diffusing metal atoms.

IBM developed a technique that harnesses electromigration and uses it to program a fuse without damaging other parts of the chip. Previous iterations of on-chip fuse technology in the industry often caused rupturing fuses, which made the chips unreliable.

The properties of eFuse make it extremely versatile and adaptable. It can be used in various scenarios in various systems. It's self-repairing and self-maintaining properties make it much more reliable than traditional chipsets over a longer period of time. The applications of this kind of chip morphing technology is endless. Although introduced in 2004, it is relevant and revolutionary till this date.
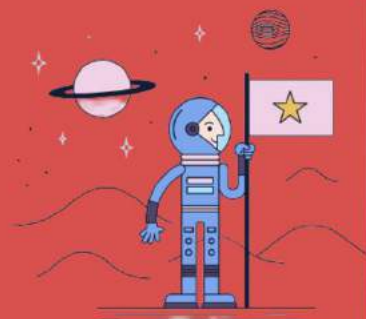
Soumya Biswas
2nd Year
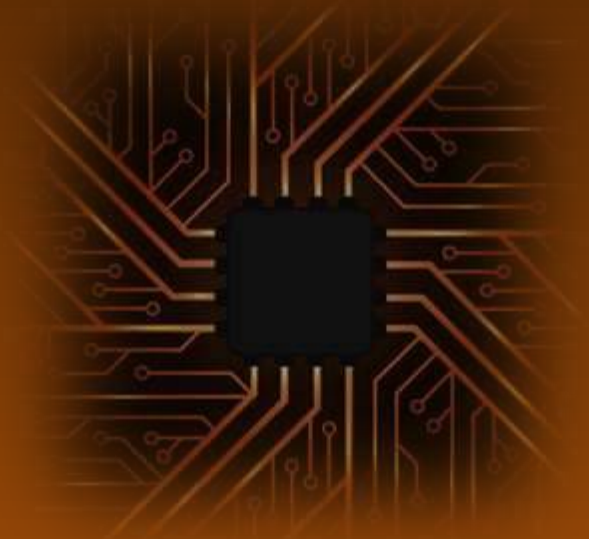
SCIENCE HUB

"Every science begins as philosophy and ends as art"
- Will Durant

MULTIVERSE

Have we finally found evidence of Parallel Universe?

Despite the idea of having an alternative reality through the infinite multiverses theory, theoretical physics do have a foothold as well. According to Quantum Mechanics "Grey Particles" are everywhere spinning in two directions (clockwise & anticlockwise) at the same time. This interpretation is the heart of the "Many World Theory" which states that all the outcomes that can possibly occur actually happen but only one outcome unfolds in each universe. That means if more than one universe exists, William Shakespeare left us a treasure of written words but in another universe he was a baker of bread.

At Dublin in 1952, Erwin Schrodinger said that when his equations seemed to describe several different histories then these were 'not alternatives' but all really happen altogether and this sort of duality is called

Superposition. Later updating this terminology, Erwin coined the concept of identical universes. Over the past few decade scientists, physicists and cosmologists have coined lots of theories against parallel universes but recently last spring(around Feb,2020) a claim has surfaced asserting that we have found evidence for parallel universe !

It all started after an experiment by the astrophysicists came out. Antarctic Impulsive Transient Antenna (ANITA) is a telescope that comprises of radio antennas attached to a giant balloon that hovered over Antarctica at a very high altitude. ANITA was sent high so that it was able to detect matter like the high-energy particles called "neutrinos" from the space and the telescope can spot these neutrinos coming from the space and hitting the ice sheet in Antarctica.

"I believe we exist in a multiverse of universes."

Dr. Michio Kaku

Surprisingly, the device picked up anomalous signals that resembled the kind that skim the earth but strangely they seemed to be travelling up from the surface and that means they had to pass through a huge chunk of the earth. These detections happened in 2016, then again in 2018, but there was no credible explanation.

The Quilted Multiverse Theory states that the Universe is infinite and therefore may contain segments identical to the one that we inhabit.

About $10^{10^{120}}$ light-years away there could be another you on another Earth.

Another neutrino observatory in Antarctica called IceCube that is run by the University of Wisconsin–Madison conducted an investigation on the ANITA findings and it published a paper in The Astrophysical Journal. The researchers said in January 2020 that "other explanations for the anomalous signals - possibly involving exotic physics - need to be considered - because the standard model of physics cannot explain these events."

The cosmologists teased the possibility of detecting signals from a parallel universe where from our point of view time runs backward (the particles seem to be travelling up indicates that the particles are travelling back in time) and the Big-Bang represents an end, not a beginning. Though there are more exotic ideas going around, such as that the heavy high energy particles in line with ANITA's data may describe one candidate for dark matter – the mysterious stuff that is believed to makes up 85% of the matter in the universe but has never been detected.

Souvik Biswas
3rd Year

NASA MARS ROVER

The Perseverance Rover which will be the 4th manned rover to Mars. The overall cost of this project would be a massive US$2.2 billion. NASA had launched the Perseverance Rover from Florida's Cape Canaveral SLC-41 Launch Center to the Red Planet on 31 July 2020 at 7:50 am (IST). Mars is situated approximately 55 million kilometers away from Earth. Calculating the trajectory of Mars, NASA announced that the rover will land on the surface of Mars on 18 February 2021, on a crater called the Jerezo crater. In the distant past, this crater is believed to have contained liquid water.

Since their first Apollo Moon Mission in 1969, National Aeronautics and Space Administration (NASA) has made enormous advances in science and technology. Now, their latest mission is to seek alien life on our neighboring planet Mars. NASA has signed a deal with another American company, SPACEX, to help them carry out

them carry out their mission. NASA has assigned primary responsibility for the design of this rover to the Jet Propulsion Laboratory, located in Pasadena, California, US.

The mission will be a joint operation by NASA and SPACEX. NASA will be sending two manned spacecraft to Mars, the first will be the Perseverance Rover, and the second will be the Ingenuity Helicopter to land on the 49km wide Jerezo crater. The Perseverance Rover is about 3 meters long, 2.7 meters wide and 2.2 meters high, making it about the size of a car. It includes a 2 meter long, pointed robotic arm that will help them gather samples from the surface of MARS in order to carry out further research. The most interesting thing about the rover is that it includes 25 cameras, of which the Mastcam-Z is a panoramic camera that will give us a 360-degree view of the surface of Mars. Another camera called Supercam-Z can not only takes pictures of Mars, but also studies the chemical composition of samples taken from Mars.

The Perseverance Rover works on a technology called the Multi-Mission Radioisotope Thermoelectric Generator. This method uses Plutonium-238 to produce electricity. It will operate on a 110W battery along with 2 lithium

INGENUITY HELICOPTER

batteries that would supply extra power to the rover if needed. This rover will help us collect knowledge about the microbial life of MARS. The Ingenuity Helicopter is just 50cm tall and the rotors are 1,2 meter long. The positive feature of the helicopter is that it can charge itself with solar energy. It also includes wireless communication systems, cameras and navigation systems. Its rotors can rotate at a rate of 2400 rpm (rpm). This will also help us to know a lot about the past and present of Mars.

With the help of this mission, NASA would demonstrate futuristic technologies that could change our perceptions and further develop technology in space science.
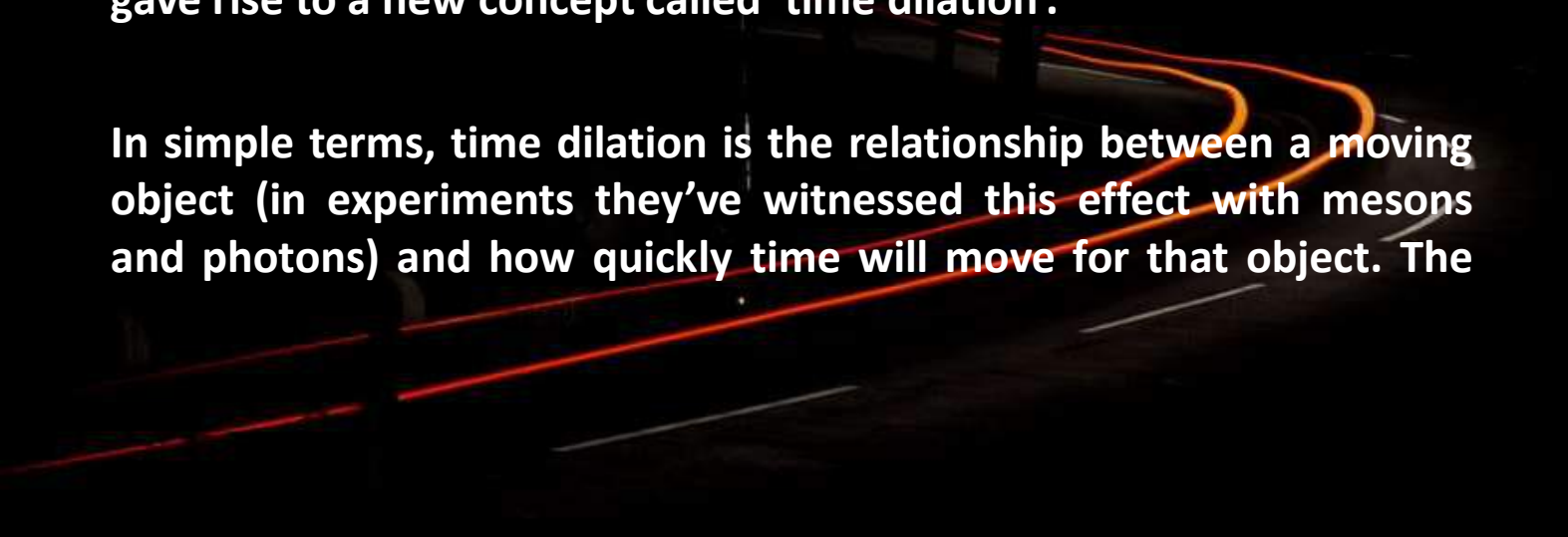
Subhadeep Mukherjee
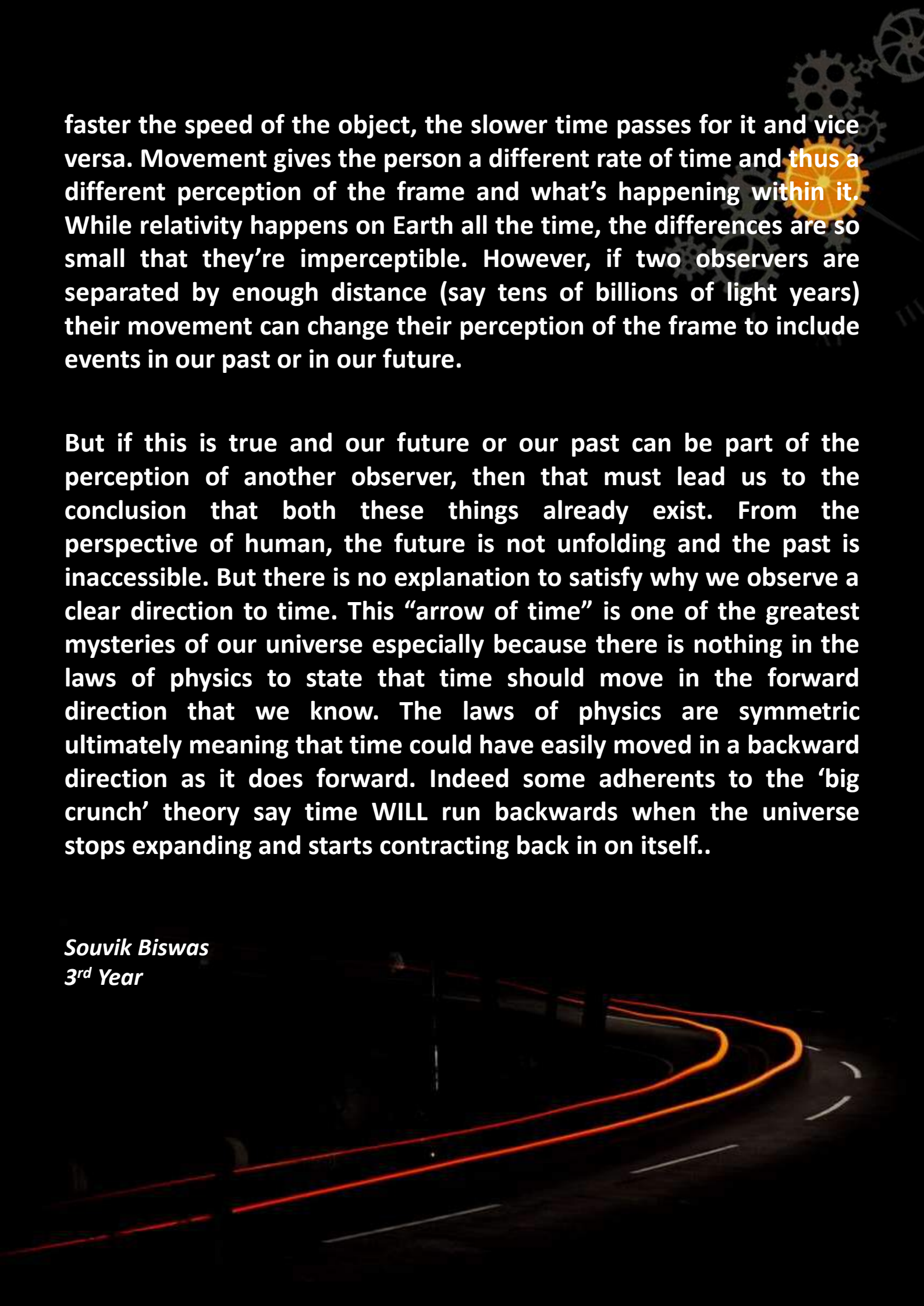*2nd Year*

Time: an Illusion?

A new fourth-dimensional structure (known as space-time model) of our universe emerged from the Einstein's Theory of Relativity. In this model, we should think of time the same way we think of space; just as all of space exists outside of our world and any point within space can be described by coordinates, all of time exists as well and any events that have happened or will happen already exist, described by their own coordinates within the universe. And the same way all coordinates in space are valid, all coordinates (or events) in time are valid as well, meaning that there should be no such distinctions as "past", "present," or "future".

This cosmos is known as the "Block Universe", a place where change isn't real and there's nothing special about the present moment. Considering this on a philosophical scale brings into question the idea of free will. This "Block Universe" model got a serious attention when The Hafele-Keating experiment of 1971 proved that relativity of time is real. Atomic clocks were taken aboard a commercial airline by two scientists — J. C. Hafele and R. E. Keating and the clocks were flown around the world, once to the East and once to the West. Upon returning, the clocks from the airline were compared to those which had stayed at the observatory in Washington. The airline clocks were found to have gained .15 microseconds. This discrepancy gave rise to a new concept called 'time dilation'.

In simple terms, time dilation is the relationship between a moving object (in experiments they've witnessed this effect with mesons and photons) and how quickly time will move for that object. The

faster the speed of the object, the slower time passes for it and vice versa. Movement gives the person a different rate of time and thus a different perception of the frame and what's happening within it. While relativity happens on Earth all the time, the differences are so small that they're imperceptible. However, if two observers are separated by enough distance (say tens of billions of light years) their movement can change their perception of the frame to include events in our past or in our future.

But if this is true and our future or our past can be part of the perception of another observer, then that must lead us to the conclusion that both these things already exist. From the perspective of human, the future is not unfolding and the past is inaccessible. But there is no explanation to satisfy why we observe a clear direction to time. This "arrow of time" is one of the greatest mysteries of our universe especially because there is nothing in the laws of physics to state that time should move in the forward direction that we know. The laws of physics are symmetric ultimately meaning that time could have easily moved in a backward direction as it does forward. Indeed some adherents to the 'big crunch' theory say time WILL run backwards when the universe stops expanding and starts contracting back in on itself..

Souvik Biswas
3rd Year

Living beings have their assembly and operating instructions in the form of DNA. This is not the case with inanimate objects: anyone wishing to 3D print an object also needs a set of instructions. If they choose to print the same item again years later, they need access to basic digital information. The object itself does not store print instructions.

STORING DATA IN EVERYDAY OBJECTS

Researchers at ETH Zurich have now developed a means of storing extensive information in almost any object in the collaboration with an Israeli scientist. "With this method, we can integrate 3D-printing instructions into an object, so that even after decades or centuries, it will be possible to get those instructions directly from the object," Robert Grass. The way this information is stored is the same for living things: in DNA molecules.

Several developments over the years have taken this forward. One of them is Grass's method for marking products with DNA "barcodes" embedded in miniscule glass beads. These nanobeads have different uses; For example, as a tracer for geological tests, or as a marker for high-quality foods, thus distinguishing them from fakes. The barcode is relatively small: filled with just one 100-bit code (100 spaces "0"s or "1"s). The technique has now also been

commercialized by the ETH spin-off Haelixa.

At the same time, it has become possible to store huge data volumes in DNA. Grass's colleague Yaniv Erlich, an Israeli computer scientist, developed a method that theoretically makes it possible to store 215,000

these inventions into a new form of data storage, as they report in the journal Nature Biotechnology. They call the storage form "DNA of Things" on the Internet of Things, in which objects are combined with information through the Internet..

terabytes of data in one gram of DNA. Grass himself was able to store an entire music album in DNA - the equivalent of 15 megabytes of data. Two scientists have now transformed

As a use case, the researchers 3D printed a rabbit out of plastic, which contains instructions (about 100 kilobytes of data) to print the object. The researchers achieved

DNA STORAGE

What started off as a joke turned into reality when two genomicists discussed how appropriate storing data on DNA could be.

Data files are converted into binary code and then into A, T, G, and C code, which stand for the four DNA bases. From these letters, blueprints for the DNA are drawn and the actual strands are created. To the human eye, the completed DNA fragments look like a tiny amount of dust at the bottom of a test tube.

Why is this a step forward? Well, data stored on DNA could be kept intact for thousands of years. Compare this to magnetic tape, which needs to be replaced every five years, and you can see the advantage

this by adding small glass beads containing plastic.

And like biology, this new technological method retains information over many generations, a feature that the scientists used to obtain printing instructions from a small part of the rabbit and print them completely new. They were able to repeat this process five times, essentially creating the "great-great-great-great-grandson" of the original rabbit.

"All other known forms of storage have a certain geometry: a hard drive has to look like a hard drive, a CD like a CD. You can't change the form

without losing information," Erlich says. "DNA is currently the only data storage medium that can even exist as a liquid, which allows us to insert it into objects of any size".

Another application of the technique would be to conceal information in everyday objects, a technique experts refer to as steganography. To demonstrate this application, scientists turned to history: among the documents attentive to life in the Warsaw Ghetto during World War II, is a secret archive, gathered by a Jewish historian and ghetto at the time Was and was hidden from Hitler's troop in the milk carton. Today, the

collection is listed in UNESCO's Memory of the World Register.

Grass, Erlich and his colleagues used the technique to store a short film about this collection (1.4 megabytes) in glass beads, which they then inserted into the lens of ordinary glasses. "It would not be a problem to pick up a pair of such glasses through airport security and thus transport information from one place to another," says Erlich. In theory, it is possible to hide glass beads in any plastic objects that do not reach very high temperatures during the manufacturing process. Such plastics include epoxide, polyester, polyurethane, and silicon. In addition, this technique can also be used to characterize drugs or even construction materials such as adhesives or paints. Information about their quality can be stored directly in medicine or ingredients, Grass explains. This means that medical supervisory officers can read the test results directly from the product to production quality control. And in buildings, for example, renovation workers can find out about the products that the manufacturers used in the original structure.

At the moment this method is still relatively expensive. It costs about 2,000 Swiss francs to translate the 3D printing file stored in the plastic rabbit's DNA, says Grass.

Shiva Shankaran
3rd Year

MEDICAL MIRROR

Regular invasive procedures are used to track major cardiovascular disasters or to treat chronic diseases. However, it is hard to always rely on invasive procedures as not only are they uncomfortable, but they bear a constant risk of infection. Hence, the importance of non-invasive, regular monitoring procedures comes forth.

Currently, the major techniques used to monitor heart rate is the electrocardiogram (ECG) which requires patients to wear adhesive gel patches, causing skin irritation and discomfort,.

or, pulse-oximetry sensors that the patients have to wear on their fingers, which causes pain if worn for a long time.

Even though the non-invasive procedures won't be able to detect minute details regarding heart rate and other procedures, they will surely prove useful in the long run for the general and continuous monitoring of physiological signals like heart rate and respiratory rate without causing the patients any immediate discomfort.

A medical mirror, as the name suggests, has been deemed a

mirror interface to monitor real-time heart rate. The interface relies on a cardio cam, looking into which provides us with the real time physiological signals of the patients. It was invented in 2009 by two students of MIT, using a simple webcam. The first ever model relied on an LCD display, a two-way mirror, a mirror frame, a stand, a laptop and most importantly, a web-cam.

The laptop was used to run the analysis software in real time and it produced the visible results on the LCD display. The user needs to look into the webcam, which detects movement and provides input to the laptop for analysis. The LCD display will continue providing a constant heart rate measurement until the patient looks away.

You would be surprised to know that this technology relies heavily on light and uses the low-cost process of low-cost photoplethysmography (PPG). With every heartbeat, the blood in our vessels increases minutely

and this increase absorbs more mono-light than normal. The camera detects the mono-light reflecting off of our faces, to detect our heart rate. The laptop to which the camera is attached has a running code for instantaneously converting the received data from the light signals into a visual graph.

As the webcam is looking at the video of our faces, it analyses each frame and detects the region of interest (ROI) in each frame so as to keep the process going accurately. The raw RGB signals are decomposed into three independent components using independent component

analysis. The user's heart rate is then quantified as the frequency corresponding to the highest frequency in the spectrum (from 45 - 240 bpm).

Medical mirror can hence be referred to as a marvel in the medical world as it will allow those with chronic ailments to live a considerably easier life, while also allowing abnormalities in heart rate to be detected earlier for otherwise healthy people.

As medical mirrors use motion-induced signals, noise and overcoming motion artifacts still remains one of the biggest challenges in the development of these devices. However, even though creating a real-time, multi-parameter physiological measurement platform based on the above technology is a work of the future, we can only hope that it will be a big step forward for humanity.

Sohini Mazumder
2nd Year
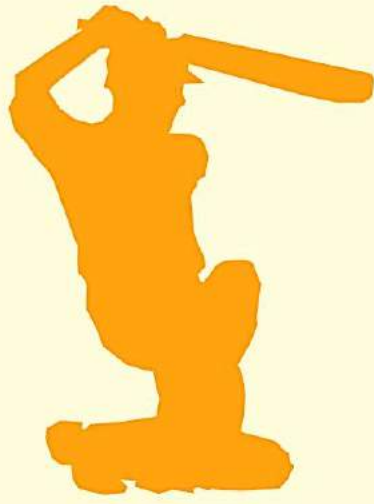
SPORTiFY

"A TROPHY CARRIES DUST.

MEMORIES LAST FOREVER"

-Marry Lou Retton

The Gegenpress

There are hundreds of soccer leagues spread across the face of the globe, and each country has its own understanding of and terminology for the beautiful game. Each of the great footballing nations have their own flair and vision about how the game should be played. From Dutch 'Total Football' to Spanish 'tiki-taka', Italian 'Catenaccio' to 'Sarriball', from Pep Guardiola to Jose Mourinho, Carlo Ancelotti to Maurizio Sarri, and Mauricio Pochettino to Marcelo Bielsa, each illustrious manager has their own, often contrasting but equally beautiful or efficient systems, which defines their vision of football, as well as creating new vistas that revolutionize the game. Here I would wish to talk about 'Gegenpressing', another stylistic vision of the beautiful game, as envisioned by the illustrious German manager Jurgen Klopp, during his stints at Borussia Dortmund and Liverpool, which has in its own way revolutionized modern football.

If you watched Liverpool's conquest of Manchester City in the 2017-18 UEFA Champions League quarter-finals, then you probably noticed that the red-clad team seemed to be doing an awful lot of running. Welcome to the "gegenpress"! The term, which roughly translates to "counter press", is a tactical approach developed by current Liverpool manager Jurgen Klopp that combines classic features of high-pressure defense with a modern twist. It's difficult to determine exactly when a systematic approach to pressing first originated, but it's safe to say that the Dutch national team (helmed by Rinus Michels) with their brand of Total Football definitely utilized a rough approximation of the technique during the 1974 World Cup.Legendary manager Arrigo Sacchi further adapted this method with his legendary Milan teams of the 80s and 90s. In response to the ultra-defensive approach favored by most Italian teams of that era, Sacchi implored his players to regain possession higher up the pitch, which would naturally lead to greater goal-scoring opportunities. To do so, the Italian mastermind utilized deliberate spacing and a high defensive line (the hallmarks of the modern gegenpress) frustrate opposition possession. Most notably, when defending, Milan's attackers were rarely more than 25 yards from the back line.

As history has shown, most coaches have utilized high-pressure defending as a means to an end: regaining possession. This follows the standard dogma that more possession logically leads to more opportunities and thus, more goals. Klopp, however, saw the beauty in eliminating the middleman and instead opted to use counter-pressing as an actual part of attack.

Klopp commonly opts for a narrow 4-2-3-1 with width provided by marauding fullbacks. When defending, a high back line effectively crowds the midfield, allows for players to hunt in packs, and makes passing through the center an unsavory proposition for opponents. This is all done in an effort to win back the ball as high up the pitch as possible. As Klopp himself has explained, "The best moment to win the ball is immediately after your team just lost it. The opponent is still looking for orientation where to pass the ball. He will have taken his eyes off the game to make his tackle or interception and he will have expended energy. Both make him vulnerable."

The gegenpress operates on the basic assumption that a team that has just lost possession (especially while attempting to counter) is in its most vulnerable state. The more rapidly you exploit that vulnerability, the more likely you are to score. Thus, unlike Guardiola's men, Klopp's charges spurn sustained possession in favor of rapid attacks.

For the system to function effectively, however, the dual pillars of fitness and intelligence are paramount. The downside to a rapid pressing system is that, if one man doesn't do his job, the entire structure can collapse. It doesn't do any good to apply high pressure to nine outfield players if the tenth is wide open for an easy outlet pass. In order for Klopp's tactics to work, each player must be capable of reading the game, understanding his specific role in any given situation, and adapting quickly in order to keep an opponent firmly under pressure. Klopp's tactics require incredible discipline and considerable training in order to be pulled off successfully. However, when it does happen, it's a thing of beauty that can't be easily contained.

Hritam Kanjilal

3rd year

Rishabh Pant : From Zero to Hero

In what was an amazing test series not only from the perspective of Indian fans but for cricket lovers from all over the globe, we saw the unfolding of a dream story of some youngsters debuting on Australian soil. Gill, Siraj, Sundar, Shardul found ways of ripping through the Aussies , surviving the most dangerous bowling line-up according to experts, humiliating them in their own den.

But the pick of them was a 23-year-old wicket-keeper batsman without whom we could not have witnessed this emphatic win. But it was not that easy. He was not India's go to wicket-keeper before the start of the tour thanks to his recent poor form both with the bat and also behind the stumps. Many raised questions over him not being selected in the 11-man squad for the 1st Test match at Adelaide. But after India's failure with the bat in the 1st test, getting bowled out for a mere 36 ,the team management tuned in as many as five changes for the Boxing Day Test ,most importantly Pant as a replacement for Saha. He did decently in that match, which India won with ease thanks to Captain Rahane's blistering innings with the bat.

With the series level at 1-1, the Sydney test was expected to be a thriller and it indeed was. The first 4 days were completely dominated by the hosts leaving the visitors to chase down a mammoth 406 for victory. Not many gave India a chance. Some former players even tweeted that India will be knocked over before lunch. But Rishabh Pant had other ideas. He rattled the opposition bowlers, just fell short of a hundred by 3 runs, giving the team a very good base from where things were in India's hands. Later courtesy Ashwin and injured Hanuma Vihari's resilience and grit, India drew the match which was the greatest escape according to some.

With the series still level at 1-1 it was all down to the Gabba test for a final shot. Gabba where no team has got the better of the Aussies for the last 32 years should have been a challenge for the visitors. But this is young India at work. They have no fear and this fearlessness was shown at the last day of the test where the hosts posted a target of 320 plus.Chasing above 300 against the likes of Starc, Cummins, Lyon could be a dream to many. But this Young Indian team knew how to convert dreams into reality. Shubman gill gave them the perfect start scoring 91 before succumbing to Nathan Lyon. India's modern day Wall Pujara stood still at one end, getting blows after blows,but he didn't give up. After his dismissal, all thought this was heading towards another draw. But When Pant is out in the middle, anything is possible. He started slowly ,but later picked up pace, hitting sixes and boundaries all over the ground. Playing those innovative ramps and hurting the bowlers even more.Around 50 runs were needed from the final 10 overs. He could have easily defended and drew the match in the case of which India still would have retained the Border-Gavaskar Trophy. But As they say , " If you have to do something special do it now " .He went for it with Washington Sundar giving him the perfect company. He finished the game with a four down the ground giving India the best gift he can. He won many hearts not only from his fellow teammates but from cricket supporters over the world. It was just awesome, probably the best innings of his life. He put to grave all his doubts regarding his selections with that innings.

With more than half of the team injured, India did a beauty which will be remembered for years to come. With the credit going to all the players out here, had Pant not been there, it could have been a different story. In the post-match presentation he even said that he couldn't do it the last time around, but this time he was not going to miss. Such was the confidence of the man. This innings along with the one before would give a huge boost to his early career and he could be one of the best wicket-keeper batsman in the Test format in coming future.

Sobhit Das
2nd Year

UNDERSTANDING TIKI TAKA

It is the Spanish way of moving the ball around in channels and passing effortlessly. Its origin can be traced back to the principles of the great Johan Cruyff.

The style is associated with FC Barcelona under their manager Pep Guardiola who was ironically reluctant to accept the fact that his team dependent on Tiki Taka for success. He once stated that he loathed all that passing just for the sake of it and that you have to pass the ball with intention and the aim of making it into the opposition's net. The Spanish National Team under their coach Vincente del Bosque is one of the best to have accomplished this style and derive success from it, achieving numerous trophies with the style – one of which is the World Cup. The team was considered formidable and was feared to face.

It is based on the theory of analysis the geometry of space on the football field. It is defined as a style of play based on making your way to back of the opposition net through crisp short passes and working in various channels. The style involves players to roam around and get involved in the build up with patience and analysis of space. Triangular passing, one touch pass and two touch passes are some of the main weapons to this form.

The style can be best understood by analysing the gameplay of FC Barcelona. They played with a high defensive line serving as an offside trap. The mid fielders provide support to the defence to make passing options surface.

The defenders waited patiently for negotiating safe passed and the midfielder exploited the space to deliver the through vertical passes. In the final third more freedom is

awarded to the players to show their creativity and hurt the opponent.

The 4-3-3 formation is considered ideal for such a playing style. Lionel Messi, Andrés Iniesta, Xavi Hernandez are few of the footballer's who understood this style and benefitted the most from it becoming one of the best's in the world.

Even though this style looks to be formidable and unbreakable. Counter attacking is the main threat to it. Launching quick counter attacks with speedy forwarded using long passes has proved to be successful against such a set up.

Tiki Taka as a playing style revolutionised football and became one of the most soothing style of the game to watch. The crisp short passes with a touch of individual skills is the perfect offensive display one can aim for.

Nikhilesh Basil

**1st year**

Battleground of 64 Squares

As we all know, chess is a board game of strategic skill for two players, played on a chequered board on which each playing piece is moved according to precise rules. Most of us have encountered this mind-game in one form or another, whether it be during lunch breaks at school, family gatherings, a friendly game with peers, chess never fails to disappoint. A lot of people in the modern world have started to play chess more seriously than before and this has led to an increased level of strategic thinking among children.

You might be surprised to know that chess didn't actually originate in Persia, unlike common beliefs, but that it originated in India, under the name of Chaturanga, and flourished in the 6th century. The earliest known form of this game had two features that remained constant even in the modern interpretation of the game – every piece had a different power assigned to it, and the game was decided by the fate of a single piece on the board, the king.

The chess board back then was called the 'Ashtapada' (Sanskrit for eight feet). In epic poetry, Chaturanga means army (the four parts of an army, namely elephants, chariots, horsemen and foot soldiers.) It has been thought that chess was initially invented as a way to develop strategies for war. It has also been assumed that it was a way to re-enact the epic fight scenes from Mahabharata.

The first documented country that Chaturanga spread to is Persia. An ambassador travelled to Persia and challenged the king saying that if anyone in the country could solve the puzzle of the chess board, the king of Hind would pay them tribute as an overlord, however, if they lost, the kingdom of Hind would be declared to be intellectually superior to them and they would demand tribute from Iran. A man named Bozorgmehr has been documented to have spent a day and a night in deep thought, after which he successfully solved the puzzle.
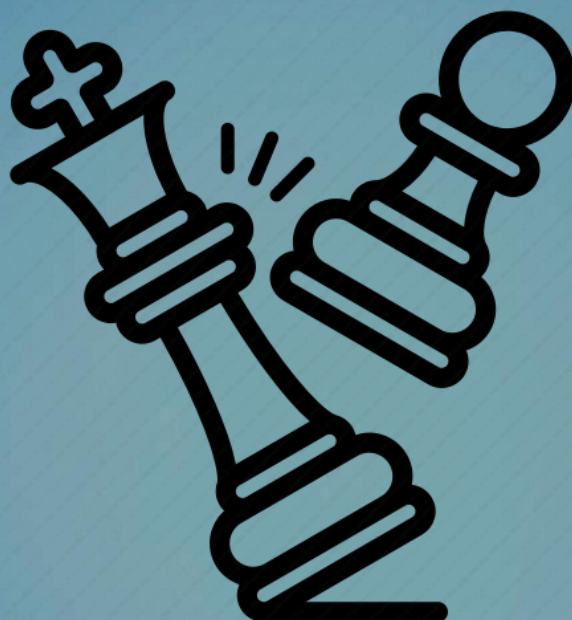
In a similar manner, and also through trade, this game spread to the rest of the world and developed in various ways, the most notable forms of the game being shogi and checkers (though the latter doesn't follow the rule of every piece having different value).
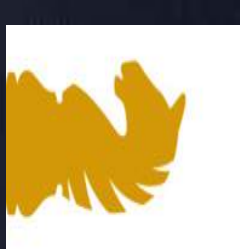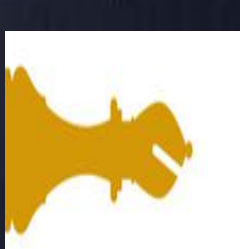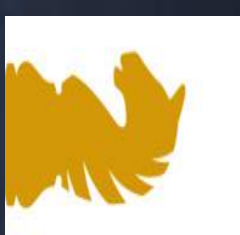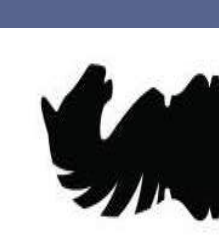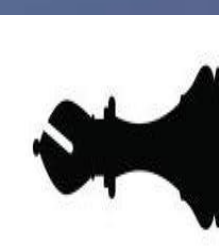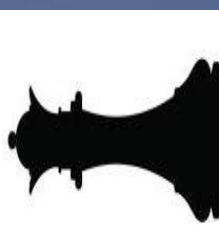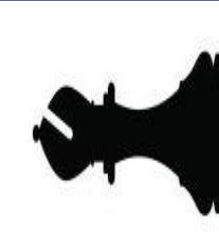
Thus, after various iterations developed the modern variation of chess as we know it. Modern chess started truly developing in around the 1470s, probably in Spain, France, Portugal or Italy when the power employed to complete this are what make chess such a brilliant mind-game. It can be compared to hand-to-hand combat in a way, that is, in their minds, the chess players go through many elaborate motions to figure out one move. No moves are wasted in professional chess games and the moves are thought through thoroughly.

As chess progressed, many organisations came up which organised friendly matches between their members. Many books were also printed on how to play chess, problems and tactics, and chess boards and pieces were slowly beginning to get mass manufactured and becoming lighter and more easily portable. Thus came about the appearance of modern competitive chess.

Competitive chess was first officially started in 1834 with the matches between Alexander McDonnell of Italy and, Louis-Charles Mahé de La Bourdonnais of France. These matches, and a series of matches played after this raised a necessity for the time restrictions used in modern chess. It was seen that players took an unrestricted amount of time to analyse their moves and this led to long drawn and tiring games. Also, when the matches adjourned for meals or overnights, it often provided an unfair advantage to the player who was supposed to move as it gave them a long time to analyse their next move.

The following years saw the development of speed chess, five-minute chess, and the most popular variant where a time bank is provided to each player, within which they have to play a pre-determined number of moves. Later on, a time budget was rewarded to the player who fulfilled the above criteria. The time was initially calculated using sandglasses and pendulums, which were later replaced by modern clocks having parallel timers with a small button for the players to press. If a player exceeded the time limit, they were penalised by having to pay fines, or forfeiting further games. Furthermore, if a player exceeded the given time limit, a tiny latch called a "flag" further helped settle arguments. This is most likely the origin of the cry of "flag-down" in modern tournaments, where, if a player runs out of time, the opponent points it out saying "flag-down" and the player is said to have lost on time.

The first modern chess tournament was held in 1851 and won by the now-renowned Adolf Anderssen whose games like the "Immortal game" and the "Evergreen game" are still considered the summit of the art of chess. Next up was the American youngster Paul Morphy was referred to as a chess prodigy who won against all important competitors including Anderssen in his short 7-year chess career. Wilhelm Steinitz became the first official World Champion in 1886 after defeating the leading Polish-German master Johannes Zukertort.

José Raúl Capablanca y Graupera was the first non-German World Champion who was undefeated in tournament plays for 8 years up to 1924. He was followed by another great and well-known player Alexander Alekhine who passed away as the World Champion in 1946. Since the end of the 19th century, the number and magnitude of chess tournaments grew and chess slowly started gaining a wide base of international audience.

Many famous players hence came about to become household names, like that of Bobby Fischer, Anatoly Karpov, Garry Kasparov, Vladimir Kramnik and many more. The most popular player in India is of course Viswanathan Anand, the first Indian World Chess Champion. The current holder of the World Champion title is Magnus Carlsen, who won against Anand in 2013 and has maintained his position at the top ever since.

With time, chess developed into the modern form we see today. The pieces used today are – the King, the Queen, the Rook (sometimes still called the Castle), the Bishop, the Knight and the pawn. Each side uses 16 pieces, occupying two rows, with the 8 pawns on the front line, and the more important pieces on the back line, the 2 rooks guarding the flanks, the 2 knights placed strategically right after the rooks, the 2 bishops placed between the knights and the royals and finally the Queen beside the King who is positioned right at the middle of the back line, just like in an actual battle.

The pieces don't have any numerical values, but in order of importance, power and strategic value, they can be ranked in the following order (from lowest to highest): pawn, knight, bishop, rook, queen. The King is not assigned a value as the loss of the king results in the loss of the game.
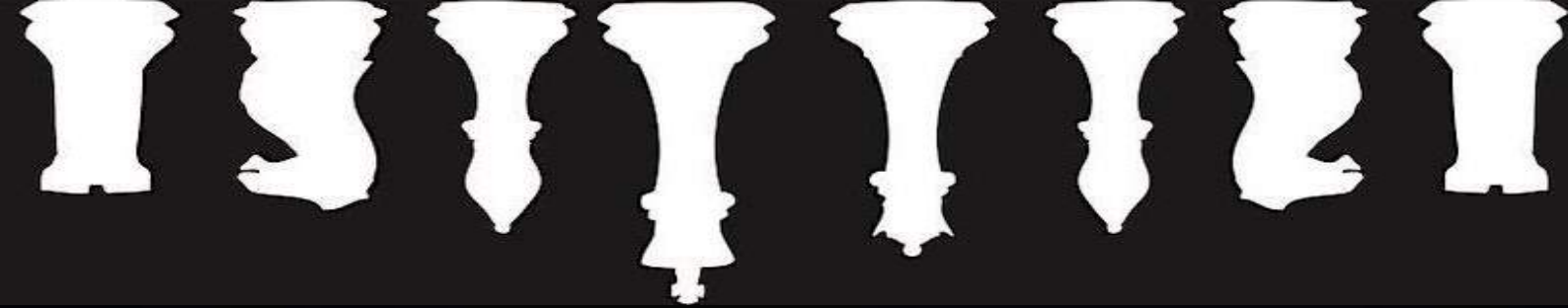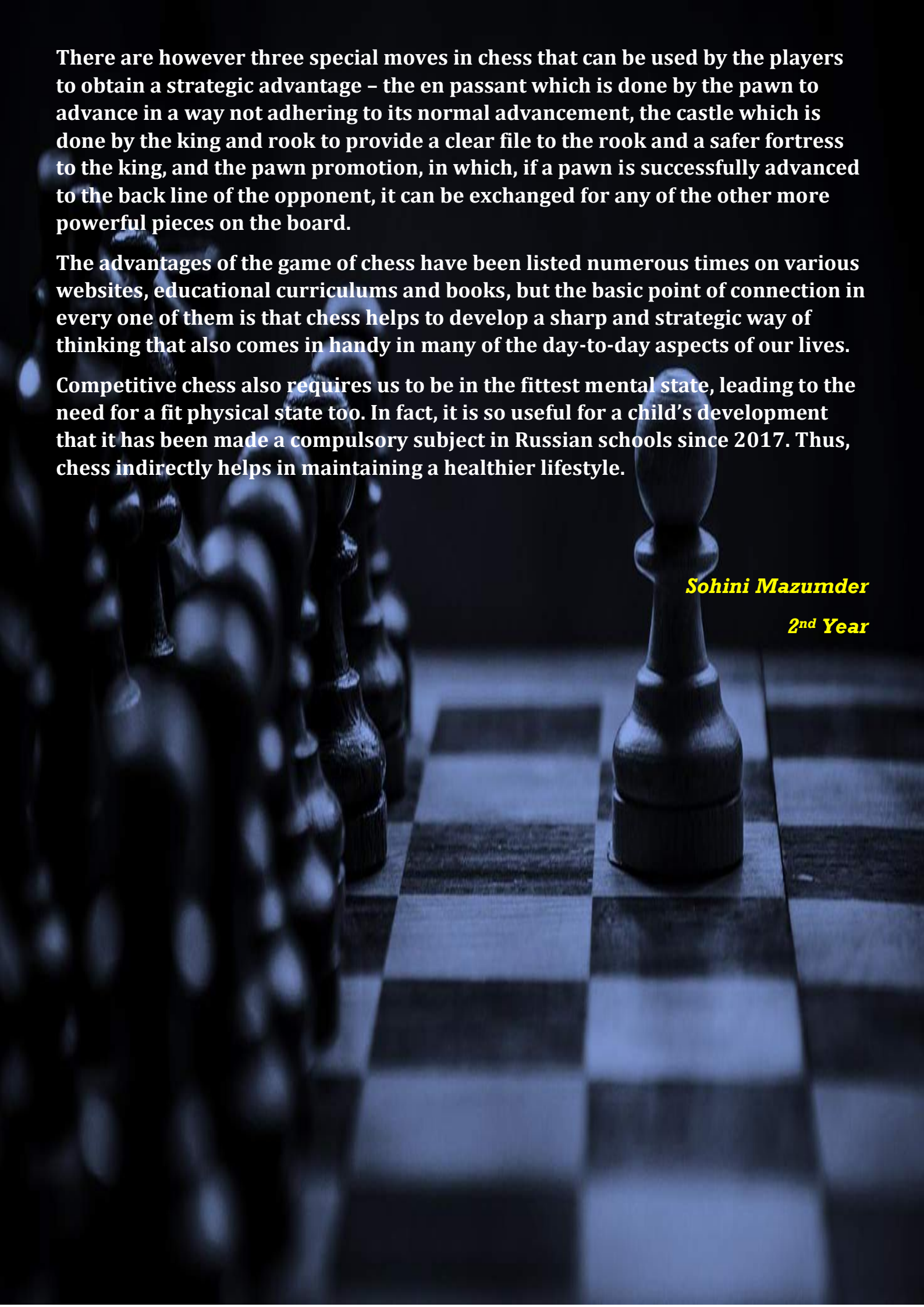
The current rules for playing tournament chess have been standardised by FIDE (Fédération Internationale des Échecs), the international governing body for chess. However, these rules are slightly modified for certain special formats of the game which include – fast chess, correspondence chess, online chess and Chess960. Unlike common belief again, chess games don't necessarily end in a checkmate (or by capturing the king as the moves prior to the capture are illegal). Games can end when one player 'resigns' if they don't believe they can win the game, or they can also be drawn in various ways including a mutual agreement, perpetual checks, etc.

The pieces move in the following ways:

• Pawn – one square vertically forward, with the option of moving two squares forward if it hasn't moved before. It captures opponent pieces by moving one square diagonally

• Knight – moves in an L-shape (or we can say 2.5 squares). It moves two squares horizontally or vertically before moving one square vertically or horizontally respectively. It is the only piece which can jump over other pieces

• Bishop – any number of squares diagonally forward or backward

• Rook – any number of squares horizontally or vertically forward or backward

• Queen – any number of squares diagonally, horizontally or vertically, forward or backward

• King – one square diagonally, horizontally or vertically, backward of forward.

All the pieces can capture opponent pieces if they are at the final destination of their moves. Being captured puts the piece out of the game and these pieces cannot be revived.

There are however three special moves in chess that can be used by the players to obtain a strategic advantage – the en passant which is done by the pawn to advance in a way not adhering to its normal advancement, the castle which is done by the king and rook to provide a clear file to the rook and a safer fortress to the king, and the pawn promotion, in which, if a pawn is successfully advanced to the back line of the opponent, it can be exchanged for any of the other more powerful pieces on the board.

The advantages of the game of chess have been listed numerous times on various websites, educational curriculums and books, but the basic point of connection in every one of them is that chess helps to develop a sharp and strategic way of thinking that also comes in handy in many of the day-to-day aspects of our lives.

Competitive chess also requires us to be in the fittest mental state, leading to the need for a fit physical state too. In fact, it is so useful for a child's development that it has been made a compulsory subject in Russian schools since 2017. Thus, chess indirectly helps in maintaining a healthier lifestyle.

Sohini Mazumder

2nd Year

Lampard: The Old Lamp

"Come to the Shed and we'll welcome you,

Wear your blue and see us through"

These were the exact lines chanted when a young manager stepped into the same dressing room he was once a part of. This beautiful chain of life cycle was a moment of ecstatic joy & immense pleasure for not only a Chelsea fan but for the whole world. But within a span of nearly one and a half months, that joy came into a halt after a series of failures.

Once again the creepy legacy of the manager replacement maintained.

Let's take a tour through the flashback.

A Creative and technically gifted box to box midfielder was signed by Chelsea from West Ham for just £11 million. Born in a family of footballers, creativity was in his blood. In his thirteen years with the club, Lampard established himself as a prolific scorer from midfield, becoming Chelsea's all-time leading goalscorer, with 211 goals scored in all competitions. He also won three Premier League titles, a UEFA Champions League title, four FA Cups, a UEFA Europa League title and two Football League Cups. In 2005, he was named 'FWA Footballer of the Year' and finished runner-up for both the Ballon d'Or and FIFA World Player of the Year awards. But in spite of such a glorious career some controversies still haunt him. One of the most notable being the dispute between him & his former manager Andre Villas-Boas when the later was sacked after just nine months of his recruitment. Later when asked about that sacking Super Frank's comments created a buzz. Many believe that event has turned out to be a curse in Lampard's life after a similar situation of a young manager being sacked after a short span at the club arose.

Whenever the blues have been in a tough situation the number '8' has always come to the rescue. Even in his short managerial span, no one can ever forget his contribution in promoting the academy players to the senior team at a time when the departure of Hazard left the fans in dismay. His famous last minute victories against Arsenal and unbeaten run against Spurs gave him the youngest Manager of the month award. Not only that, he also became the only manager to spend a record of £250 million signing in a single transfer window in spite of the current pandemic situation. He was a warrior then, is a warrior now & will always be the same forever. We strongly believe he will come back soon as "Without God it is in vain". ("Nisi Dominus Frustra")

Saptarsi Sen

4th Year

Inked Thoughts

"We write to taste life twice, in the moment and in retrospect".
-Anaïs Nin

Duty Calls

Insight of the story: The story 'Duty Calls' focuses on the devastating effect that the Cyclone Amphan caused to the Sundarbans and its people, in year 2020. The story begins with the narrator spectating its surrounding. As the story unfolds, different events explains the dreadful situation the villagers are currently in. Amphan hit the country's southwestern coast, affecting more than a million people. The irreparable losses that Sundarban succumbed to is beyond explanation.

'Duty Calls' share the feelings of every villagers of Sundarbans and connect its readers directly with the current circumstances of Sundarbans.

Disclaimer: The characters in the story are fictitious, but the incidents are real. I have used my perception of what the villagers must be going through. Even the new rescue recruit member is just an illusionary character used as a way to connect its readers with the villagers.

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I am standing here on a narrow lane and right in front of me about five meters away there's a man, who is walking towards his house which has been already washed away by the cyclone. He is immersed in this deep cycle of trauma, passing by his battered field he picks up those debris and left grains of his house from the ground.

There's a sound of crying I can hear, when I turn towards my right in a 3'o clock direction. There's a woman covered with mud all over her face and her hands are tightly embracing an old age lady, who couldn't get out of the house in time. Low beneath her knees were badly crashed down by a heavy iron slab.

While I move forward I see there's a young boy, who sneaked out of the shelter camp. When he takes a notice of his nearby scenario, I see his playful smile wavering into a stare of

dejection and confusion. As if he came into a vcompletely different dimension. The sight was dreadful for anyone to behold. Houses dismantled and roofs plunged open, half-broken, some of them hanging on the entrance of the house. His homeland was all in shatters. He speeds up his pace and approaches his father. Asking, "Daddy what just happened here?" His father looks at him and says to get back to the shelter. While holding a lump in her throat his wife come closer and interlock her finger with his. Saying, "We both are in this together... Remember?.. Together we can make wonders happen!" The farmer wipes tears off his cheeks and look at his wife, then turn his face to see their life's greatest gift running towards the shelter camp. Somehow he felt fortunate enough among all the villagers.

When I shift towards my left, there's a body crushed underneath the heavy electric pole. A villager standing nearby me says "He ran to his house to get his only family photo, since the last calamity washed away his entire family members." From the look of it, he was electrocuted by the uprooted pole, while he was on his way to the shelter camp after procuring the photo frame.

I am standing there and trying to reach my hand to help. But then my consciousness questions me. Who to first help? And from where to start? I could feel the sudden gush of helplessness in me. I can't even console them by saying "Everything will be alright." Because the loss is too much to be repaired and there are many in number that can't even return back to normal. No matter how much I try, this time I can't make things right.

The ones who are alive can't think of a way how their tomorrow is going to be and what it holds for them. There's a very little amount of food and water left in the shelter camp, since the cyclone damaged all stored foods, fields and the water is saline to even drink. The shelter camp was in a chaos. I come up to give this elderly man with a packet of biscuit. He stops me and point towards the other direction saying "First serve the mother and the baby."

After three hours of continuous run, I came out of the shelter camp to take a quick breather. Walking towards the embankment, I saw there a lady picking the wet loose sand from the shore to put them in the sack. When I take a closer look, there's eleven to twelve men helping her stacking them up.
Few distance away in a chain-like formation villagers gathered to plan

and rebuild the island. The villagers straighten their back and get back to work. The cyclone has taken everything, except their will.

After few minutes there was a cluster of villagers collected to help rebuild this island ... In a chain form I am in amazement this whole time. Witnessing love, conviction, innocence, courtesy, kindness, mercy and togetherness of mankind through this calamity.

As a new rescue recruit member I got to experience more than I ever imagined. I left my house on the 30th of Ramadan with Ammi and Abbu saying, " Eid is all about togetherness, to be with the people and spread love. So, go on your mission and make it a success!" It was all like a usual talk of encouragement and motivation for me, but then standing here I am realising what they actually meant.

Never in my life I imagined I will get to experience an Eid with such unity and togetherness.
What an Eid it is!

And here I was expecting this year like always I would be celebrating Eid with my usual close ones, where I would endlessly be sharing some sweetness and trying to erase bitterness from few ties.

After all these thoughts rushing at the back of my mind, I hear my Senior calling out to me. He says, " The patient on bed no. 005 needs an emergency treatment. The paramedics did the best they could, but the patient is condition is worsening. We immediately need to shift him to a proper hospital."
Wiping my sweat off from the temple of my forehead I fixed back my cap and said, " Understood, Sir! We'll be ready to move within half an hour. "
And there's my duty which calls for me.

Fabasherah Malak
3ʳᵈ Year

DAFFODIL

Every night I hear whispers in the wind,
The voices of the lost souls who come to me,
And tell me stories of who they used to be.
I have heard a thousand different stories,
I have lived a thousand different lives,
And every night I have died a thousand different times.
But no story I remember more,
Than the one she told me a week before.
She was the only daffodil in a garden of roses,
But no one seemed to notice and no one seemed to mind,
They all taught her to be pretty, brave and kind.
They told her to stand her ground come whatever may,
For the ones who fall, are the ones who get taken away.
But she liked the breeze brushing against her cheek,
She liked swaying to its rhythmic beats.
She was a daffodil and she wanted to be free,
There was so much out there for her to see.
So one day she decided to finally let go,
She cut herself loose and let herself blow.
For a while the wind carried her in his gentle arms,
There were so many places she wanted to go.
But the roses they had taught her too well,
For the moment next, down she fell.
She tried her best to get up again,
But her desperate attempts were all in vain.
In a moment the gardener's boy came to pass,
He spotted her lying on the grass,
He picked her up and took her away,
And put her down where his sister lay,
In a grave marked Daffodil Ray.

Tathagata Pal,
2nd year

Success and Comparison

Often we are told that the key to success is hard work. Having sharp memory can increase our chances of being successful. But wait! What is success? How can we measure or define it? And how does it affect us?

Success is a condition often accompanied by a feeling of satisfaction and happiness. Usually if a work gets completed without a hitch and expected outputs are obtained, we say that the work has been successfully executed. But it turns out that success itself is not absolute. Infact it's as volatile as the person who experiences it. For example, if a student gets a rank among the top 10 students of his class, he might consider himself successful. But another student might think that success means coming first in class. Someone else might consider passing an exam as a huge success. But the level of satisfaction and happiness experienced by the 3 students is the same.

In the same manner, people can relate success to how much money someone earns, or how healthy someone is. A beggar might consider himself successful if he is able to get 10 rupees by begging. A business-woman might consider herself unsuccessful due to a decline in her profit. Thus, success depends on the perspective of a person.

Since success is not rigid, we try to compare our achievements with those of others. And these comparisons play a huge role in our perception of success. Suppose a student scored above 80 marks in an exam. As soon as he learns his score he wants to know how others have performed. If others have scored below 70 then the student considers himself quite successful. However if others have scored even better marks then the student might not consider his achievement good enough. This comparison is essential in our daily lives as it gives us a picture of the society and our place in it. Sometimes, it can help us assess ourselves and find our flaws. Even the severity of a challenge can be evaluated by comparing scores. For example, a score of 50/100 can be considered impressive if the exam is excessively tough i.e. if others have performed in the same range.

But this comparison also has a downside. Comparison with only one type of element can lead to false considerations about one's ability. Comparing 2 students on the basis of academics might make the low scoring student feel

worthless. With respect to the other. But that does not necessarily mean that he/she has no potential.

Another property of success is that it changes for the same person too, with respect to time. Think of life as a hurdle race. If we can jump over a hurdle effectively, we regard our attempt as successful. But as we keep jumping over more and more hurdles, we soon lose the importance of our past successes. Our confidence grows and so do our expectations. But life is hard and some hurdles are just too high to cross. If we fail to hop across such obstructions, we start regarding ourselves as a failure. Our confidence shatters and crossing even the smallest speed-breaker becomes difficult. And even if we are able to cross those relatively small barriers, we don't consider them as successes. This is due to the overconfidence that often develops in our minds after a series of successful attempts. We make false assessments of our abilities and lose the respect for the smaller hurdles that we've already passed. In fact we stop considering them as hurdles at all.

For example, we don't consider class tests as a hurdle after passing the final exams. This leads to underestimation of challenges which might lead to a failure. So it's important to make advancements in life, set higher and higher targets, and strive to perform better than before. But it's also necessary to remember the lower steps of the staircase of development.

So success and failure are not absolute; they depend on our point of view. That is why, the feelings associated with success or failure also depend on our frame of mind. But while comparing our achievements with others and trying to find out who is more successful, we can lose our peace of mind. No amount of success is enough for us. So we might set out on a wild goose chase trying to capture success and ending just inches away from it. But where this race ends depends on us. We might consider ourselves lucky and successful for what we have achieved already. Or we might just keep on running on this hurdle track without ever stopping to reflect that whatever we have achieved so far is actually great. Perhaps the realization that our past achievements were amazing, and those barriers were equally challenging, can serve as an inspiration to overcome even harder challenges and powerful hurdles which life might have in store for us.

Sagnik Mukherjee
2nd Year

You are worth your LIFE!

Life O Life

Why so serious?

Why do you push me to the extremes of thought?

I gaze in the sight of what

I've lost all these years.

Look back at your silly mistakes,

And just smile back at them.

Because that's the most you can do about.

But now that I know

it's all about learning to

Make the most out of it.

There are millions of reasons to be happy

But another million to make you worry

Remember to play it fair

Because it's all in the mind of a winner.

You don't know what's gonna come ahead,

But a bumpy ride is sure by your side.

For any error that creeps into your mind,

Remember this too shall paas...

Our life begins with a win,

Leaving behind millions of counterparts.

So, you already are

One in a million!

-Rajat Kumar

4th Year

The Backrooms

You have breached into the middle space. The in-between. Miles and miles of mono yellow, empty office space, abandoned rooms, and the smell of moisty carpets. You haven't been here, not as far as you can remember, but it still feels familiar. Like someone reached into your subconscious and pulled out the most viscerally disorienting and uncharacteristic space in memory. The backrooms of reality.

You're not sure how you got here. Maybe you took a wrong turn somewhere. Maybe you're in some storage space. Outside, you remember, it's Tuesday, sometime between 7 and 8 in the evening. You were at the hospital - or at least you were supposed to be at the hospital. The blood test reports should've been ready by now. You just need to find your way back to the waiting room and the receptionist will get some nurse to hand it to you.

Except... you don't see the waiting room. You can't remember the way either. Everywhere you see it's just an endlessly receding line of walls covered in a violently dull muted yellow wallpaper, devoid of any furniture, windows, or people. The only thing other than you, the walls, and the similarly dull carpet is the lighting on the ceiling. Also dull beyond belief.

You don't understand what's so, so uncannily familiar about this place. It feels like an odd mixture of something you might have seen on TV, like a background on an infomercial you only caught a glimpse of before your parents hurried you to bed - the ignored space between the wall and the TV screen. Like a stage for unreality to unfold for consumption of a middle aged couple somewhere perpetually stuck between the ennui of daily wage labour and the numinous beauty of nostalgia. This forms the background to their daily corporate mandated catharsis before bedtime.

And you, unfortunate and unloved, are stuck here. Between the TV screen and the wall. Between reality and dream. Between familiarity and disorientation. Between this world - and the next. You, sometime

during the monotonous routine of blood tests and highways and gas pumps and smartphone notifications, have managed - in your dreams, somehow - to no-clip out of reality.

This goes on forever. It's six million square miles of abandoned office space with the same dull yellow wallpaper. The madness of sheer loneliness grips you. You know, through some discrete form of intuition, that you are alone here - or at least any being you encounter here would be about as clueless as you. Yet, the lingering suspicion of uncertainty remains.

You remember your childhood bedroom. It was haunted by the presence of your brother's ghost. He occupied a shadowy corner of the room, his glossy eyes glinting in the afternoon dark as he watched you play with toys that you once shared, but now are yours completely. He watched your every move, how you put the pieces on top of another, and you swore you could here a slight laugh when your architecture inevitably collapse under its disbalanced weight. You were never as effortlessly good as him.

Yet, this is a different form of haunted you recognise here. A more unfamiliar, inhuman kind. Not a presence in the house, but a presence of the house. It is everywhere all at once. The house, the building, it watches you. It contemplates with you. To it, you are the proxy for the human race - weak, pitiful, and utterly, utterly unremarkable. The same human race that built the houses they live in, terraforming the earth to suit their means, populating the structures, building parking lots and dining rooms and central courtyards and office blocks... and ultimately leaving them to die.

The house feels anger. Like a neglected child after it has grown, the contempt for its creator supersedes any melancholy that ever existed. And you, in its eyes, are the creator. There's no ghostly presence, nothing to hide from, nothing to hide behind. Just you, your sanity, and the backrooms.

The mention of your name pulls you back. A glitch in the matrix, a sting of jamais vu, and the inevitable fall back to reality. Your name seems oddly unfamiliar, it's syllables echoing in the eerily empty lounge you are currently orienting yourself to. You take a second to locate the source of the sound, all the while mouthing your name silently, almost as if you'd slip between the layers again if you lost it somehow. The nake gives you an anchor. It steadies your brain. It restored your sanity - or whatever was left of it, anyway.

As you cling to the sound of your name, the receptionist calls it again, visibly frustrated at the lack of a response.

"Your reports are ready, sir."

You nod. Of course they are.

A few minutes later, outside in the parking lot, you see it. A lone car in the desolate, barren wasteland of modernity. A recurring cultural dream taunting you to return to the liminal space you just escaped from, to the mysterious seduction of the anger.

But you can't acknowledge it now, having clipped back to reality. You have respawned here in the parking lot. The game has restarted.

Sagnik Bhowmik
2nd Year

An old soul

I wonder today

questions so basic

buried under everyone's spine

Not just mine

And I ask

Is it worth to try?

when I will die

And everyone I know

And everything I don't

Does this make a difference?

Labels of success

Or failure

Or is this an excuse

To run away

I cannot decide

I cannot hide

I tried to run away

But maybe that's not the way

Guide me O'Lord

And lead the path

Maybe I am just lost

An old soul trapped

On a Pale Blue Dot.

-Adarsh Raj

4th Year

Home

As I enter through the gate, it feels like it has felt for the past 22 years - home.

"Look who made it to your wedding Priya." greets aunty with a smile as big and bright as the sun.

" I wouldn't have missed it for the world." I reply coyly.

She then guides me to Priya's room.

"You look beautiful." I tell her trying to put on a smile.

"You always said that."

"I meant it everytime."

Just when I thought the air of uneasiness had started to lift, she says "Never thought we'd part like this."

"Me, neither."

She then holds my hand and just like a habit, I reciprocate.

Neither of us seem to let go.

She has never been good at expressing herself. Tonight, neither am I.

I let go of her hand.

"Please Stay." her eyes well up.

" It will only hurt more." I say.

" If you knew then why did you come? You could have chosen not to. I would have understood."

" I couldn't miss the chance to see you. Never have."

I get up to leave.

"I'll miss you Ruhi. I'll never forget you nor the time we spent together."

"I'll miss you too. Now don't cry. It will ruin your mascara and besides, it isn't good for the bride to cry on the eve of her wedding."

I leave the room without looking back. I thought I had finally found the strength in me to let go, even though my tears suggested otherwise.

" You are leaving early beta." says aunty as I reach the doorstep.

" I'll arrive early tomorrow aunty. Don't worry."

My feet have never felt this heavy before. It feels as if they are trying to take the weight off my heart.

Archisman Dey,

4th Year

It's Just a Paper

Set in the era of a virtual world,

Say 22nd Century,

Is neither a tragic story

Nor a happy ending one.

It's just the story of a paper.

"What's this we see in the picture?"

Asked the kid curiously to the teacher.

"Well, let me tell you something very clear,

It's a stack of real paper you see here."

"A time when news was printed on paper,

When it penned down a billion dollar thoughts,

It had the power to turn people from rags to riches,

And from riches to rags the very next day.

Years passed and technology crept in.

And for once and all, paper,

Swept away from the real world,

Into the digital screens, the unreal one.

Making it a world of the virtual zombies,

Where have the days gone by?

When touching paper,

Was real fun.

— Rajat Kumar

4th Year

Cartoons and Fairy tales

"They are for children, they don't exist.

You're an adult now--

They are things you should resist"

Currently this is the attitude of the society as most of the people tend to think cartoons, fairy tales and fables are for the little ones. We think that the colourful characters, those vivid landscapes, and those great stories don't exist in the real world. But is it true?

First let's see where these characters come from. These characters are the ripe fruit of pure imagination mixed with realization of something beyond our perspective of the world. These things tell us about life. Only thing is that it is presented to us in a simple language. But some of us are too arrogant to accept them as we think fairy tales are 'too simple' to contain any 'worthy information'.

Every cartoon character, fairy-land creature is unique in its own way. Starting from the blue cat chasing that brown mouse to the latest trends of toys that come alive when their owner is not around, and cars have life of their own... each presentation has some message to convey. For the children, the messages

sometimes are meaningless; or perhaps they just see the colours on the canvas. But a much deeper meaning comes out once we absorb those stories with our adult brains.

Cartoons can voice protests, stories can spread awareness. They can act as eye-openers. Every cartoon character can be thought of as a representation of the different

phases of life, different states of our mind that we encounter; Just like the dragon represents evilness (according to Christian traditions), griffin represents boldness, Thomas the tank engine shows an adventurous mind.

So cartoons do exist. They are all around us. Our life is also a fairy tale. They live among us as human beings and yet we fail to recognise them.

Sagnik Mukherjee
2nd Year

Journey Within Me

Gazing at the sky

When I lay supine

Amidst tranquility

Some noisy thoughts gush through my mind

Why am I so busy in these chores of mine?

Such interrogations make me grind.

As a conciliating wind blows over my pile of worries

I stifle this silent rage

That stems from vast uncertainty.

Will I be brave enough?

To lift leaden bars

From this prison

This inexorable cage?

The birds in my heart begin to shrill

In solitude

Longing for plethora of self-love.

I was too beguiled by the desires that made me drill

Fathomed this while looking at the sky above.

Soon I took an indelible and unceasing journey within me

Something so alluring that the riches of the world I could see

Some great strengths and some beautiful flaws.

Disturbed by a scream

This bizarre feeling soon withdraws.

Most exciting journey I had it ever

This was a catalyst for all the endeavour.

Feed yourself with love, care and charm

Unstoppable you will be in situations that alarm!!

Sakshi Agarwala

1ˢᵗ year

How to keep yourself motivated during bad times?

What is motivation? Motivation is just like a hormonal boost to the human mind which activates all the cells of the body to work to its maximum potential. Motivation can be of extrinsic type or intrinsic type, the later is developed by the power of thought and imagination.

There has been a lot of research in the field of human mind and action and the best conclusion out of it is that the action of the human body is totally controlled by the quality of one's thought.

Having motivation is just like a small hope of light which sparks at a thousand kilo meters apart, and the more you get closer to your aim the brighter and bolder that spark will become. In other words, motivation is just like a gigantic wave to the settled stream of river.

The importance of the cheapest or you can say the most expensive thing that is water is only felt at its peak when you have not taken a single drop of water from the last 2 days in a country like Africa where the temperature is sufficient enough to roast an omelette on the blank street in the noon time. In the similar manner it is very important to have two opposite things in this universe to run a balanced life, so good times and bad times flee in one's life at a certain interval of time.

Bad time in one's life teaches one to deal the adverse effect which the life throws upon. Bad times in one life make the individual to throw the maximum out of its inner self. Believe me staying motivated in the adverse time is the key to the success in one's life.

As I already said, thinking is one of the most powerful tools which the god has given to us, so thinking affirmative thought in the adverse time helps a lot to build the intrinsic motivation. Doing work in a routine way in the bad times also motivates to keep focus on the regular track. A positive mindset and patience over the bad times is very much important for success.

We should always try to take control over the things for which we can create a difference with our own hard work and perseverance rather to think over anything for which we cannot take charge over. So, in bad times it is very important to take charge over your skills and work with a positive mindset and to be motivated.

Lastly, one most important way to stay motivated is to celebrate every moment with cherishment, it does not matter whether the moment is big or small.

-Vaibhav Mehrotra,

2nd Year

{Untold}

Days are dull,
But the sky is full.
My vision isn't clear,
And I tremble in fear.
I want to run ,
But I cannot.
I want to see the sun,
When will I have my shot?
I eat my food,
Sleep and drink.
Where did it go wrong?
Why did you cut my wings?
And cage me in this hell?
Oh,You don't want me to fly?

Maybe my cage is airy,
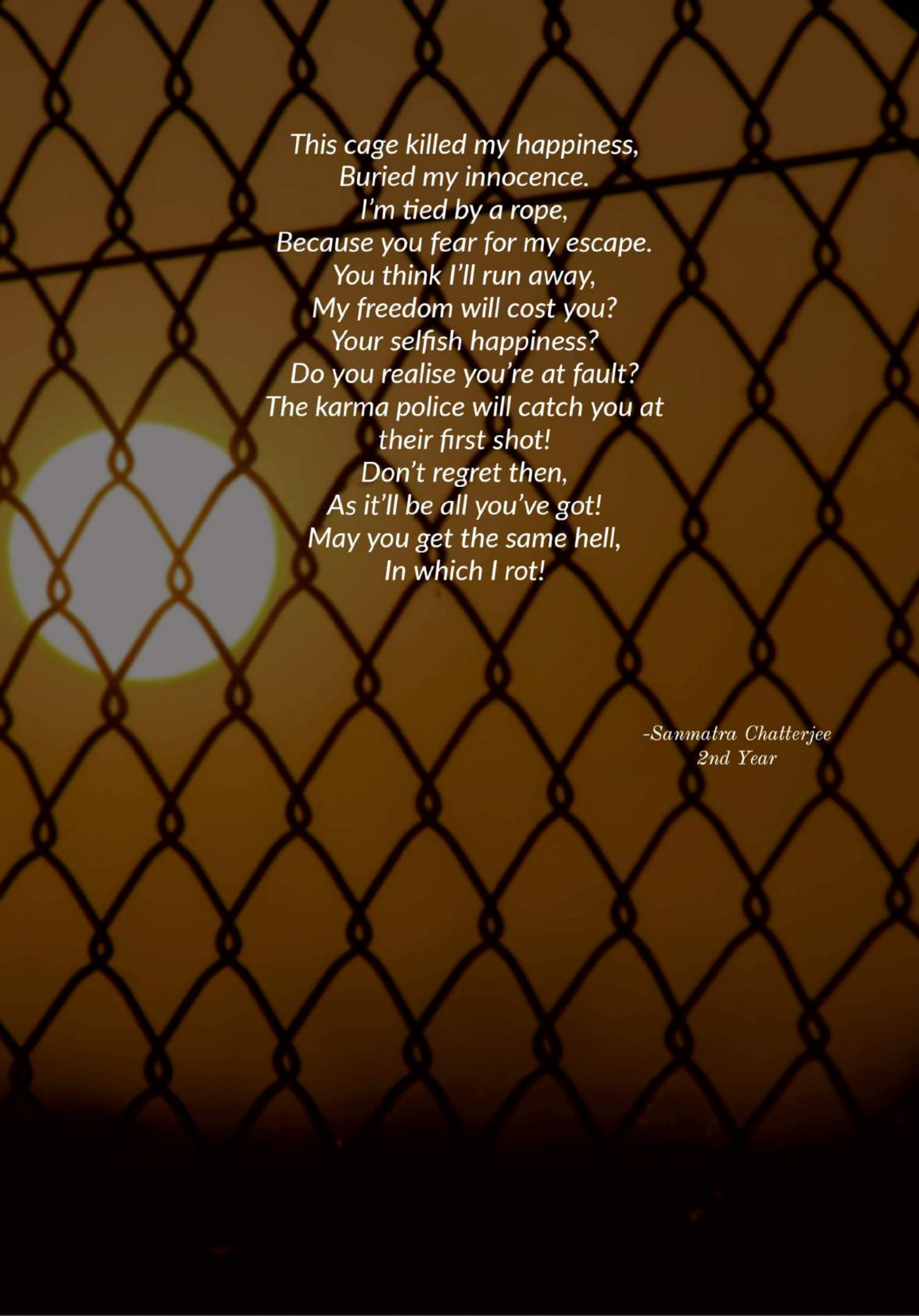So you don't worry?
But my freedom is lost,
Do you realise?
I don't have a family,
Not the one you're proud about.
I cry to my tears ,
Which aren't real?
You don't see my pain,
But you want to play with me in the
rain?
How much longer can you sham?
You don't discern how obscure I am.
Can you kill me already?
Before I die in this vanity.

This cage killed my happiness,
Buried my innocence.
I'm tied by a rope,
Because you fear for my escape.
You think I'll run away,
My freedom will cost you?
Your selfish happiness?
Do you realise you're at fault?
The karma police will catch you at
their first shot!
Don't regret then,
As it'll be all you've got!
May you get the same hell,
In which I rot!

-Sanmatra Chatterjee
2nd Year

Endings

It was another tiring day of the week
when I was returning from the office
the clock ticked 6 p.m.
the birds were returning to their nests
and the sun was slowly retiring for the day.
A man who had just been rejected by another company
was sitting and staring into the horizon.
He had lost all hope and his dreams were crumbling in front of him.
A lover was standing in one corner
with a crushed and decimated rose at his feet.
The torn petals of that flower which was scattered on the ground
told a very painful story.
A tea seller was shutting down his small tea shop
and it felt as if he was putting a lid
on the kettle of his son's dream to go to college.
As he knew that the steamless kettle had gone too cold to fulfill his son's
dream.

I was sitting in one corner
and watching these warriors who had just lost the battle of Life.
They were dejected ,broken ,bleeding and defeated.
But I smiled.
I smiled because I knew
that today was not the end.
I knew that
they will fight back tomorrow again.
Tomorrow will be a new beginning for them
with a new ray of hope.

That same tea seller will again open his small tea shop from 5 a.m.
That same man will wear a new shirt and go job hunting to a smaller
company.
That same lover will not pick up the torn petals of that flower but will
pick up the broken pieces of his heart and will try to look for love in
this loveless world

*Just like
the end of winter marks the beginning of a new spring,
every sunset marks the promise of a new sunrise
and each sunrise brings a new day with new hopes for new beginning
that reminds us that we ,too ,can start afresh with positivity and gratitude.
Ending marks a new beginning.*

-Shreeparna Debnath
4th Year

THE WORLD

TODAY

THERE NEVER WAS A TIME IN OUR HISTORY WHEN IGNORANCE OF CURRENT
AFFAIRS COULD BE SO DANGEROUS - EDGAR DALE

THE MYANMAR COUP D'ETAT

2021

Hritam Kanjilal
3rd Year

The 2021 Myanmar coup d'etat began on the morning of February 1, 2021, when democratically elected members of Myanmar's ruling party, the National League for Democracy, were deposed by the Tatmadaw—Myanmar's military—which vested power in a stratocracy. The Tatmadaw declared a year-long state of emergency and declared power had been vested in Commander-in-Chief of Defence Services, Min Aung Hlaing. The coup d'etat occurred the day before the Parliament of Myanmar was due to swear in the members elected at the November 2020 general election, thereby preventing this from occurring. President Win Myint and State Counsellor Aung San Suu Kyi were detained, along with ministers and their deputies and members of Parliament.

When an election landslide first ushered the National League for Democracy into a position of power in Myanmar, the party gained a mandate to extract the country from the army's grip after decades of ruthless military rule. The challenge was finding a way to pursue its agenda without prompting the military to retaliate. Under the country's military-drafted Constitution, the party had to share power with the army, which had once imprisoned many of its leaders. It pushed hard on its primary goal — bolstering the power of its singular leader, Daw Aung San Suu Kyi. In other ways, it was in step with the military, leaving many of its repressive laws in place. But it also lived in fear, and the party tread gingerly after a key legal adviser was assassinated.

For the National League for Democracy, or N.L.D., there was no escaping one fundamental truth: The generals always had the upper hand. On Monday, they wielded it brazenly, retaking full power in a coup d'etat. "It was always contingent on the good will of a single person, the commander in chief, not to use force to achieve his goal," said Richard Horsey, a political analyst in Yangon, Myanmar's largest city. "The National League for Democracy always believed a coup was around the corner even when it was not. This time it was." Claiming that elections in November were tainted by fraud, the commander in chief, Senior Gen. Min Aung Hlaing, declared a state of emergency on Monday, asserted himself as the nation's leader, and placed Ms. Aung San Suu Kyi and other civilian leaders in detention. For the military, known as the Tatmadaw, the last straw appears to have been the lopsided result of that election, which sent the N.L.D. to an even bigger victory than the one that first thrust it into power in 2015. The military's proxy party suffered a crushing defeat.

Soldiers guard a blockaded road to Myanmar's parliament in Naypyidaw on February 1, 2021. STR/AFP via Getty Image

Ms. Aung San Suu Kyi, who spent 15 years under house arrest during the previous era of military rule, now faces a possible prison term over the charge of illegally importing walkie-talkies.

The country has appeared largely peaceful in the days since the coup, though a government ministry ordered Facebook blocked through Sunday.

People join a rally against the military coup and demanding the release of democratic leader Aung San Suu Kyi in Yangon.
[Reuters]

In its first statement on the developments in Myanmar, the United Nations Security Council on Thursday called for the "immediate release of all those detained" and emphasized "the need for the continued support of the democratic transition in Myanmar."

Police officers run during clashes with protestors rallying against the military coup and demanding the release of elected leader Aung San Suu Kyi, in Naypyidaw. [Reuters]

But the statement offered no hint of possible sanctions or other consequences. Ultimately, Myanmar's contentious civilian-military partnership unraveled because of the competing desire of two people to be president: the Lady and the general. Gen. Min Aung Hlaing has pledged to hold new elections within a year. Many doubt that he will keep his promise. A free election with all parties participating would be unlikely to give him the result he wants.

"The military has two problems," Mr. Horsey said. "Aung San Suu Kyi is incredibly popular, and they are incredibly unpopular."

"Remember Remember, the 1st of February"

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SOCIAL MEDIA AND ETHICS

SWARNADEEP SAHA
1ST YEAR

me when I realize my actions have consequences

"How do you sustain a business model in which users don't pay for your service?"

"Senator, we run ads."

-Mark Zuckerberg, the CEO and co-founder of Facebook, replying to a question by U.S. Senator, Orrin G. Hatch.

other similar social networking sites every day. BBC covered a report recently on how terrorist organizations evading Facebook detection techniques were "found to be plotting, preparing and launching 'raids' on other Facebook pages, including those belonging to the US military and other political leaders." It is widely agreed upon that none of the developers on these platforms endorses these acts but nonetheless, to misfortune of us all, it occurs.

We are living in a chaotic world, where every policy is met with extreme criticism and extreme favoritism both.

The internet is no more a place for a few established engineers in a desperate need for a hobby, nor is it a chip to be surgically implanted in your brain. The invariable recognition of its importance could never be suited enough in our times. Some of us would even unhesitatingly pick having Wi-fi over having food for a day if provided with a dilemma.

In 2004, a student with a Harvard sweatshirt dropped out of the esteemed university to create a website which would change the way we see every relationship and the world at large. Mr. Zuckerberg, perhaps unknowingly, also changed the course of history that day.

We can't imagine the havoc it would cost if the young CEO, to the delight of some parents, pulled out Facebook from the world. But some critics claims that's the only viable solution to stop the abhorrence caused by Facebook and

THEY DON'T CALL HIM "SNOOPY" FOR NOTHING

We speak in radical terms and we make strong philosophical and political criticisms using not more than 280 characters. The algorithm that runs these websites, in pursuit of favoring the advertisers and the marketers, creates echo chambers to keep us more engaged in their website. In the book, Ten Arguments for Deleting your Social Media Accounts Right Now, Jaron Lanier calls these algorithms, "Behaviors of Users Modified, and Made into an Empire for Rent" or BUMMER. BUMMER is what sums up these 21st century infamy the best. Both in 2016 and 2020, it was alleged by several sources that Russian Hackers plotted to disrupt the presidential election in the U.S. These are real consequences of Social Media and its ineffable reflection on the real world.

We can comfortably concur that social media got uncontrollably got popularized between 2009 and 2017. According to available federal data of these years, rates of depression among teens between the age 14 to 17 increased more than 60%. The stark increase in depression among preteens, that is 12 to 13, was 47% and post teens, which is 18 to 21, was 46%. The correlation of these data to the rise and inevitable cause of this teenage despondency is undeniable.

Jack Dorsey, the CEO of twitter, on oath admitted that none of these consequences were intended or even thought of when the bunch started their journey in 2006. It's something to contemplate over. The history of 21st century humans' rests on the hand of a few 20- to 35-year-old developers in Silicon Valley whom we didn't vote for nor we have any free will to overthrow. They have the capability to dent our society to enough to deflect election results and start wars.

Evidently, Facebook was used to incite genocide on Myanmar and the social media platform even admitted its failure to suppress hate speech and implement its community guidelines. Our democratic free speech is turning back on us and social media is the whip on that horse.

The over-exploitation of human behaviors and tribal nature is the very basis of Big Tech's business model. There is a necessity, as a culture, to understand that Social Media is failing us. They are failing to understand the utility of their power and inadvertently misusing it. The intention is not, nor it can be, to burn these companies to the ground. The intention is to understand the ethics of a big company and to have a war of ideas on how it could be substantially implemented and improved.

As the classic saying goes, "If you are not paying for the product, then you are the product."

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Ever wondered why, almost all the middle-class families work hard for money, but most of them struggle financially?

FINANCIAL LITERACY IN INDIA

AYUSH DEY

1ST YEAR

Most of us lack a certain area of knowledge, as it is not taught in our school curriculum, i.e., Financial Literacy. About, 55% of Americans invest in the stock market, whereas only 2% of Indians does so.

In 2019, the average inflation rate in India was 7.66%. So, basically, a certain product costing Rs.200 earlier, would now cost Rs.215.3. So, we can see that, the purchasing power of money decreases over time. In order to avoid this problem, the term Investment comes into play. Investing is the process of buying assets, with the view that the value of the asset will increase over time, thus making profit. There are different modes of investment, like real estates, common stocks, fixed deposits, commodities (e.g., gold), cryptocurrencies, etc.

Risk is involved in high return investing modes like stocks and real estates, but the risk can be minimized with proper research and analysis on the topic.Reading financial books, researching on the Internet and keeping a track of the financial section of newspaper are some steps to get started in developing one's financial skills. Some of the highly recommended books are Rich Dad Poor Dad & The Intelligent Investor. So, whether a person is from Science, Commerce or Arts background, Financial Literacy is something, which is required by every section of the society.

THE GAME**S**TOP GAMBLE
*by Naveen Kumar Bharat , 2nd Year*

GameStop, GameStop, GameStop!

This one word was the buzz of Wall Street in NYC in late January. It gripped the headlines of major news channel and was viral on social media. People summoned their inner Jordan Belfort from Wolf of Wall Street to give their opinion. Even the meme lord, Elon Musk tweeted the word 'GameStonks' on twitter. Let's take a stroll down the D-Lane to understand this commotion.
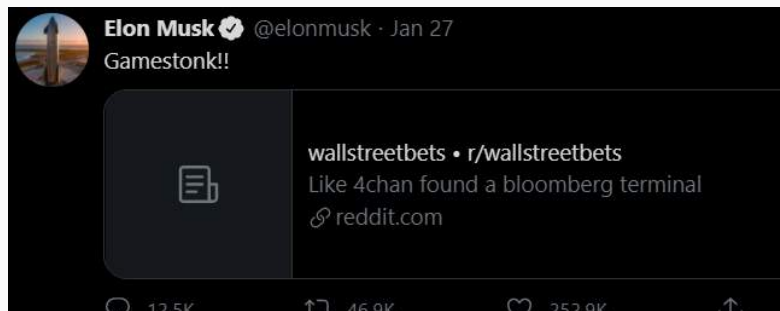
GameStop is an American store which sells video games, consoles and other electronic devices. Being a physical store, it wasn't doing well due to the pandemic and the lockdown. Being listed on the stock exchange it's shares were traded regularly. Sometimes people buy and sell shares of a company on the assumption that they won't do well in the future. Hedge Funds (big corporations) use this type of investing method called 'Short Selling'.

A 'Short' is when you borrow a stock from your broker and sell it instantly at its current price. Then you hope the price of the share falls so that you buy the borrowed shares at a lower price and return t to your broker, but you keep the profits.

For example: let's say I want to short the shares of an X company. I borrow 1 share and sell it then at $10. I now have $10 but I owe my broker the 1 share I borrowed. Assume that the price of the share drops to $8. Now I cover my short position by buying back my 1 share at $8 and return it to my broker. I sold the share at $10 and bought it at $8, hence my profit is $2. This type of trading is risky as the price of shares of a company in a day are highly unpredictable. It's a gamble and has a flip side too.

Instead of the price of shares going down suppose it goes up to $20. I still have to return my share to my broker. Now it's going to cost me more to buy back the share. So, now instead of making profit I have suffered a loss of $10. The more the prices go up the bigger will be my losses. As the shares can go up unlimited, so my losses can be quite literally infinite.

Now, regarding GameStop, a user on reddit noticed that a hedge fund was doing short trades against GameStop. Now this user convinced everyone on wallstreetbets, a subreddit to join hands and buy shares of GameStop as much as possible. This trend drove the prices up and the hedge funds started to lose billions. The hedge fund losses surpassed its own valuation of 13.1 billion dollars. Desperate to cover their short positions, the hedge funds bought all the shares back at inflated prices eventually creating what is called a short squeeze. The hedge fund went bankrupt. All of this eventually lead Robinhood, the stock trading platform to limit the no of trades on GameStop.

Look, I'm going to have to ask for the money back--the rich are really getting pissed off."

The whole of Wall Street deemed this joining of public and manipulation of stocks illegal, but in reality, they got defeated in their own game.

VACCINATION : THE FINAL CHAPTER

Sagnik Mukherjee , 2nd Year

Nationwide lockdown

Failing healthcare systems

A general restriction on outdoor time

All this goes to show what a microscopic virus can do to our Advanced Human Society. For the last 12 months, life has changed considerably. Busy highways, schools, and public spaces have become empty. A lot of people lost their jobs, some of us lost our loved ones. Earlier people used to exchange smiles when they met. But these smiles have been eclipsed by masks. All this due to a submicroscopic infectious agent that replicates only inside the living cells.

To combat the covid 19 virus, scientists across the world had joined hands to make the vaccine. A vaccine works in lots of different ways. In a nutshell, a part of the virus is injected into our bodies. Those parts may include spike proteins, attenuated viruses, etc. Normally these are not enough to make someone sick. But they can trigger an immune response. As our immune system considers these parts as threats, it creates memory cells that remember the attack and the particular type of antibody needed to defeat the invaders.

Right now some parties claim that they have made the vaccine to stop covid-19. Such vaccines include Covaxin of Bharat Biotech, Covishield of the University of Oxford in collaboration with Serum Institute of India, Sputnik V developed by Russia, Pfizer-BioNtech, etc. Each vaccine undergoes a series of clinical trials and tests to ensure that they are effective and do not have side effects.

On 16th January 2021, India started its nationwide vaccination program against covid 19. Currently, Covishield developed by Serum Institute of India and Covaxin of Bharat Biotech got emergency approval for use in India. The healthcare workers and frontline workers are the first to receive the vaccine. People who are above 60 years and those above 45 with co-morbidities have started receiving vaccines from 1st March. India is also exporting covid vaccine to Oman, Mongolia, Saudi Arabia, Myanmar, Bangladesh.

Let us hope that the vaccines work as expected and we return to our normal lives.

FROM
THE
CANVAS

"Art, washes away from
the soul, the dust of
everyday life."-Picasso

Shogun Banik , 2nd year

Soumyadip Bera, 1st year

Anuroop Chakraborty,1st year

Rahil Sengupta, 1st year

Megha Roy, 1st year

Riya Kundu, 2nd year

Alokeparna Debnath, 2nd year

Arnab Prasad Panda, 3rd year
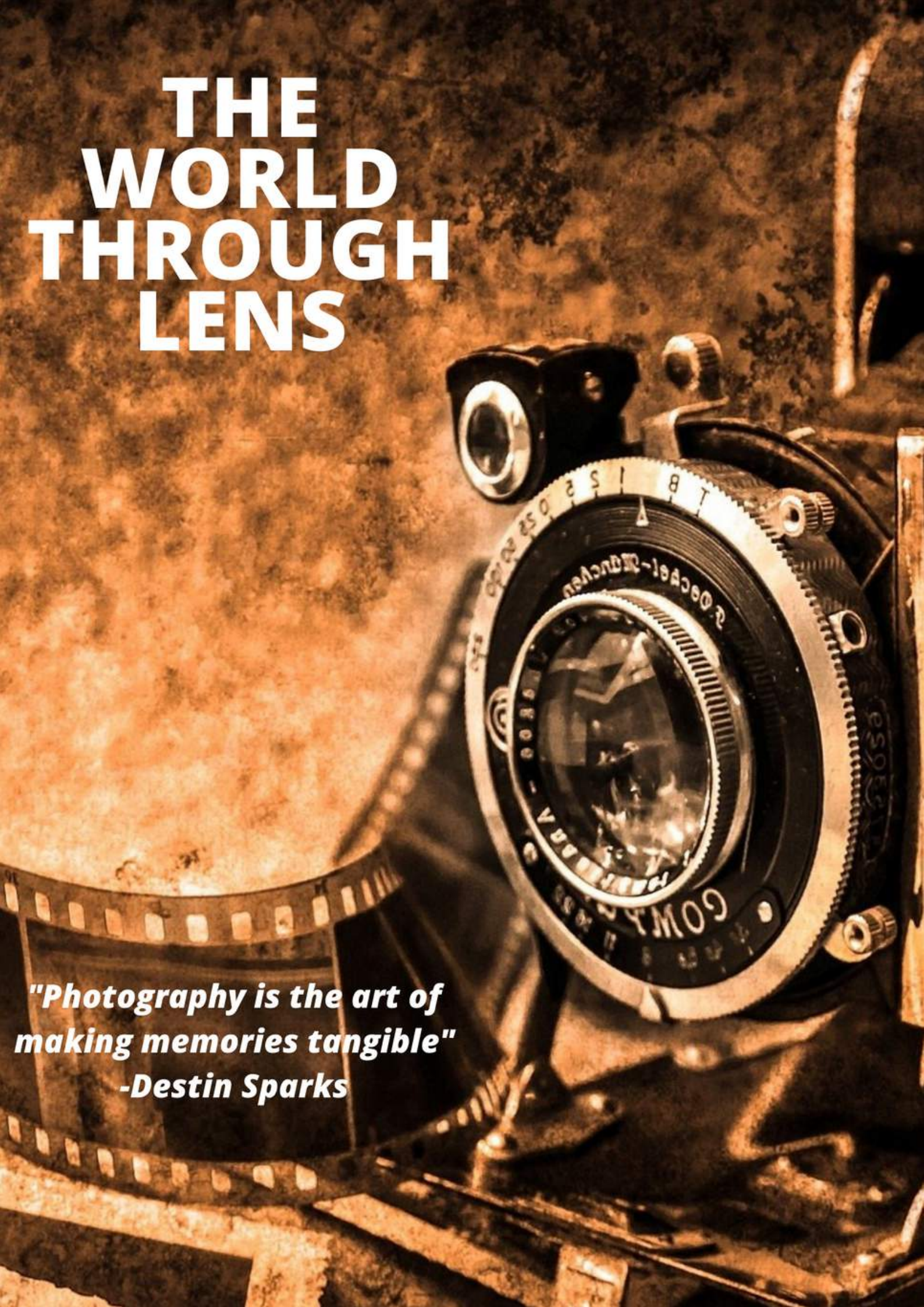

Rakhi Nandi, 1st year

Ayanava Das, 1st year

Angel Shaha, 1st year

THE WORLD THROUGH LENS

"Photography is the art of making memories tangible"
-Destin Sparks

"Lights will guide you home"
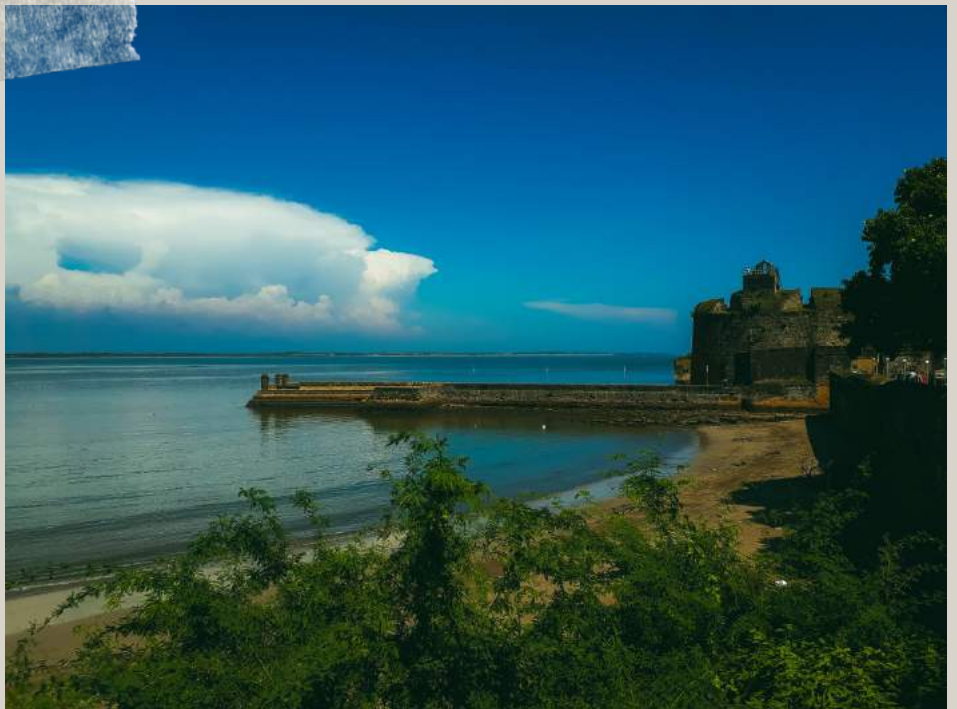S.K Rumman, 1st year

"Beneath the open sky"
Ayanava Das, 1st year

"Taking the long way home"
Dipanjan Sarkar, 2nd year

"Let the waves carry you"
Soumik Chakraborty, 2nd year

"Listen to the sound of falling rain"
Shreya Arvind,1st year

"Wild and beautiful"
Dipanjan Sarkar,2nd year

"Pearls of nature"
Aaheli Maity, 2nd year

"The horizon bowed"
Biswaroop Joardar,
1st year

"Her wings unfolded"
Debolena Dutta,
1st year

"Into the oblivion"
Debankur Kundu, 2nd year

"Closer to heaven"
Anwesha Ghosh, 2nd year

IN OTHER NEWS

FLAVOURS 101

Being brought up in a Bengali family you are always a foodaholic person. I like most of the Bengali dishes but when it comes to chicken nothing can beat BUTTER CHICKEN, a desi Punjabi butter chicken to be more specific. If you want to know my thoughts about cooking, I was always passionate but never got an opportunity until lockdown. I am not praising myself but I can cook really well . So, let me share the story behind butter chicken along with the recipe in the shortest of ways because it is readily available over internet. And let me just share a quick fact, butter chicken is one of the most searched dishes over the internet and it also has a controversial story.

Somewhere in northern India, few chefs from a dhaba found that previous night's tandoori chicken was left over. So naturally they got worried. So they started putting those chicken pieces over tomato sauce and as the chicken pieces were dry they started adding some cream and butter to bring richness to it. So, if I just say a few words about the recipe, my mother helped me in chopping the tomatoes and onions along with garlic crushed into pods and ginger being sliced. And then I placed a heavy bottom pan and added butter cubes and yes! yes! please don't be judgmental in using butter. Along with butter I added those veggies and some whole spices and gave a quick stir. Once the tomatoes were soft, I blended the gravy. Trust me that smooth gravy was so jolly and eye catching. I felt a sense of accomplishment. And yes! Don't forget to put salt in that gravy cause I almost missed that.

Now butter chicken is not a historical dish as per the Indian food history is concerned. Roughly it is a dish of around 65-70 years old and as being said in past, it is a post-partition dish. And the magic in the dish is, this recent dish added its name in the book of dishes, you should definitely try out.

So let me just end up with the recipe part. Now once the gravy was ready, I added a few cubes of butter in a pan and added the gravy along with some chili flakes. Now tried to being perfect I used left over tandoori chicken but yes as said over internet you can use freshly made tandoori chicken as well. Then I shredded those chicken pieces and tossed them over the gravy and yes being a foody I dropped a few pieces in my mouth as well. Cause smell of tandoori chicken is hard to resist. After that I added a bit of kasturi methi and gave a quick stir so that the flavors get rounded off and trust me that shine was enough to make me feel that something delicious is ready to serve. And yes it was done.

Yes, I felt it would taste good but as I took the first bite, it was more delicious than what I expected. I was flabbergasted. My mother was stunned too. It was not my first attempt at cooking but It was my first try over any chicken dish. And yes, butter chicken will always be placed at the top of my favorite food list.

Ayan Bhattacharjee
1st Year

CHOCOLATE MARBLE CAKE RECIPE

- <u>**Preparation Time:10-15 mins**</u>
- <u>**Baking Time:40-50 mins**</u>

<u>INGREDIENTS:</u>

- ½ cup milk
- 1 cup powdered sugar
- ¼ cup butter
- 1 tsp vanilla extract
- 2 cup maida
- pinch baking soda
- ½ tsp baking powder
- pinch salt
- 2 tsp of cocoa powder
- 3 eggs

<u>PROCEDURE:</u>

- ❖ Grease the cake tin with oil and a pinch of maida and line the bottom with a circle of greaseproof paper.

- ❖ Add the butter and sugar together and add the 3 eggs, one at a time, mixing well after each addition. Then add 2 cups of maida ,1/2 cup of milk gradually(as needed) and 1 tsp vanilla extract and mix well until the mixture is smooth.

- ❖ Divide the mixture between 2 bowls. Add 2 tbsp cocoa powder into the mixture in one of the bowls and mix well.

- ❖ Add 2 tbsp of vanilla cake batter to the greased cake tin.

- ❖ On top of vanilla cake batter add 2 tbsp of chocolate cake batter.

❖ **Alternatively, add vanilla and chocolate cake batter allowing to spread naturally.**

❖ **Using a toothpick, give a zig-zag swirl to get a nice design without disturbing the layers.**

❖ **Pat the tray 2-3 times to remove the air bubble present in the batter.**

❖ **Place the cake tin into the oven and bake the cake a for 40-50 minutes.**

❖ **Allow the cake to cool completely and now serve it with a cup of coffee.**

Soumi Banerjee

3rd Year

KHIRAI:
The Valley of Flowers —

Nabendu Kundu
1st Year

Khirai, a small well-arranged railway station on the Howrah-Kharagpur route, bordered by the Kansai River. The Flower Valley of West Bengal is situated there.

You may not find snow-covered mountain fragrance here, but you will get the real 'Face of Bengal' filled with the unadulterated taste of Bengal and the river-house-field-people. Which will draw you in the midst of all this is the open swing of thousands of flowers. It will look as if waves of different colours are flowing.

In one line, if you visit this place once this place will attract you again and again.
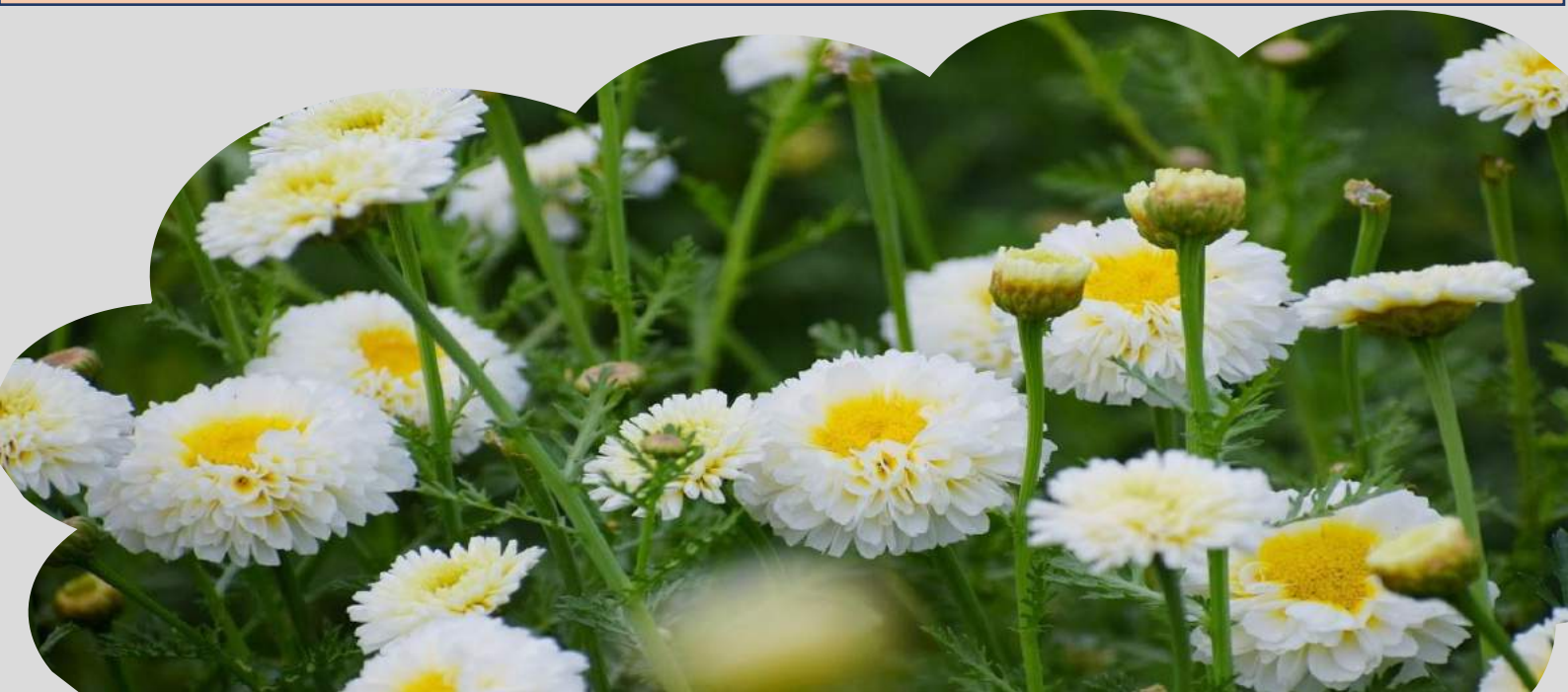
Stanley Kubrick: The Most Caring Sculptor of Cinema

Stanley Kubrick, one of the most influential director in the history of modern cinema often mentioned as 'The greatest filmmaker Hollywood ever had.' Critics are divided on this quote. Some people even judge Kubrick on his performance in the Oscar. Yes, Kubrick had a serious problem with the Academy. Neither him nor any of his films ever received any award, only exception is '2001: A Space Odyssey' which was awarded for 'Best Special Effect', why and how, we're discussing. Anyway, the moral of this long introduction is that, you can love him, you can hate him, but you can never ignore him.

So, why is Stanley Kubrick so special?

❖ Versatility ~

First of all, versatility. Almost every filmmaker has his own comfort zone, very few are exception, Kubrick is one of them. Throughout his career, he made total 13 feature films widely covering 9 major movie genres and every film itself is a cult classic in it's own genre. Sci-Fi fan, pick up '2001: A Space Odyssey'. Horror freak, watch the iconic 'The Shining'. Thriller lover- 'The Killing' is for you. Want period drama- 'Barry Lyndon' is here. Like to have some war movies? Go for 'Full Metal Jacket' or 'Paths of Glory.' Enjoy satires or black comedy, how can you ignore 'Dr. Strangelove'. Romantic movie- 'Lolita'; erotic drama- 'Eyes Wide Shut'; Kubrick can answer everything. Is there any genre left now? Take a bonus- 'Clockwork Orange'. This dystopian social crime drama is included in the top list of classical Hollywood movies.

❖ Ambiguity/ Duality ~

Kubrick never used to finish his films. Many of his films are wide open to interpretation. He never put a fullstop at the ending scene, always left a thread for the audience. And when we start to imagine the proper explanation, we think about the movie over and over, we start to live the story, we start to lose ourselves into the depth of the plot. And thus the film becomes our favourite, we begin to get influenced by the film and when a large amount of audience can relate the fantasy, the movie becomes iconic.

'Full Metal Jacket' is a perfect example of this kind of ambiguity. Unlike the other war and anti-war films, it never draws a prominent line between war and peace. Rather it shows the duality of man throughout the movie and ends with a cloud of ambiguity. This forces us to think more and more, following which the characters come out of the screen and walk in front of us to clear our doubts.

❖ Subtle Storytelling ~

Stanley Kubrick always preferred the subtle way of storytelling. He left many subconscious messages inside his films. For example, 'The Shining'. A simple suspense story turns to a terrible real life horror complex just because of the brilliant scene arrangements and extremely disturbing psychological treatment. Another Kubrick masterpiece 'Dr. Strangelove' consists of these kind of pseudo messages, which makes it the finest portrayal of the cold war era.

❖ Visual Style ~

At the first point, we were talking about versatility. Legendary director Steven Spielberg is one of those few filmmakers who can compete with Kubrick in this field. Both the directors have their respective pattern. But Spielberg's essence was enriched technical parts whereas Kubrick chose more artistic approach. And this style is heavily dependent on beautiful visual orientation which again consists of three main sides; the use of colour, light and set designing.

1. Colour Correction

Kubrick was the master of colour palate. He   like to play with them, mix them and create unique shades which can prominently build his characters, add beauty and layers in different scenes. He mainly utilize colour palate to show the contrast of evil and good, the imbalance of human mind and the organized disturbance in society. This kind of artistic use of colour helped him to create some unforgettable moments in his movies specially in 'A Clockwork Orange' and in '2001: A Space Odyssey'.
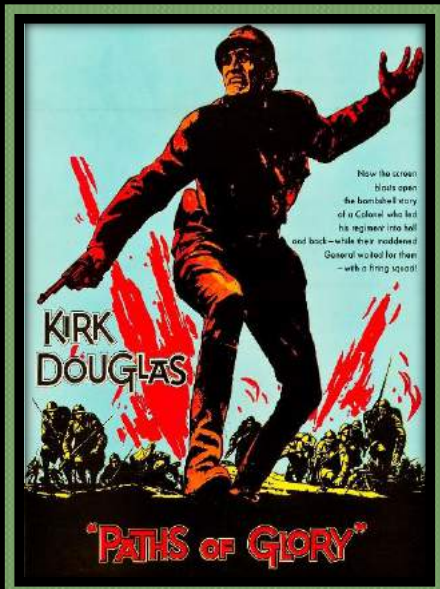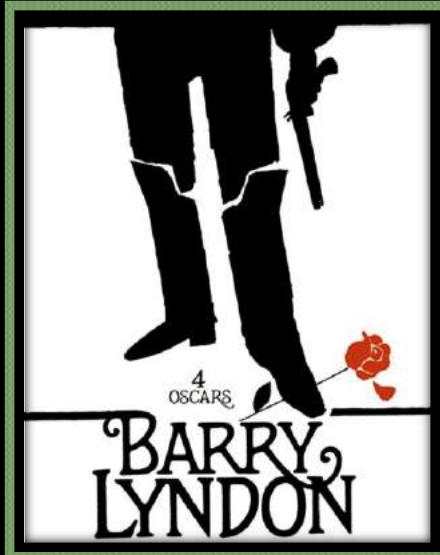
2. Light

Light, shadow and darkness would be useful to portray the eternal desires, deep psychological message and a memorable scene. In 'Barry Lyndon' Kubrick made an impressive use of candle light to shoot an iconic scene.

3. Set Design

Kubrick was very concerned about production values. He decorated his sets so sincerely that those elements in the sets themselves become the influence for future filmmakers and set designers. Best example is 'A Clockwork Orange' where the magnificent arrangements in set carry the vital part of the film atmosphere. In the films like 'Eyes Wide Shut' and the 'The Shining' set design not only strengthen the beauty of the screenplay but also help Kubrick to plant some subconscious elements.

❖ The Perfectionist ~

Stanley Kubrick often gets addressed as 'The Perfectionist'. This is because he never gave away a scene or never retired before it got completed accurately. He used to live in the scene and wanted the audience to live in the scene too. So he used to retake the same scene again and again until and unless it looks perfect through his vision. Sometimes this process made the actors and crews exhausted during shooting. Shelley Duvall claims herself "a victim of Kubrick's mental torture for extreme perfection". Another actor Malcom Mc Dowell also accused Kubrick as his eyes got scratched during the shooting of a violent scene in 'A Clockwork Orange'.

Anyway, criticism never be able to force back Stanley Kubrick. His first feature film was 'Fear and Desire'. Kubrick himself was very disappointed after making this war drama. He was so much irritated that he burned all the negatives of this film. Just because

his own movie doesn't match his level of satisfaction, he tried to erase this 'imperfect work' from the history forever. A man who had this much level of dedication, how could he let a scene remain intact with the slightest stain.

'The Shining' holds a record of the maximum number of retakes in a single shot with 148 takes. On the other hand, the film is considered as the most iconic horror movie ever made and that particular scene is now in the list of the most iconic cinematic moments.

So, that is how Stanley Kubrick was. A silent servant of art, the most caring sculptor of cinema. He used to spend year and years to think, to modify and then to execute innovative ideas. His music, shot division, staging, blocking, screenplay writing; all carries a deep ocean of effects as well as a lot inspiration to future filmmakers. He hardly lost his patience, he designed the reel life with so with so much intense care and beauty that sometimes they became the pioneer to real life. For example, '2001: Space Odyssey' predicted every minute details of today's space adventure long back in 1968. At that time, when NASA didn't dare to send Apollo 11 in the moon, Kubrick showed us a vivid journey through modern day spaceship. That was a core reason why the Academy was bound to award this film even though they had a bitter relation with it's director.

Kubrick was not beyond controversy, rather controversy was linked with his life and with all of his films. But in the end, in the endless space of cinema, Kubrick is that eternal Sun that always illuminates the viewer's earth, makes them feel alive, no matter how dark is it outside.

Debankur Kundu

2nd year

DEMON CORE: The story of 'Rufus'

Who is Rufus? Rufus was 14lb pound sphere of plutonium. This and few experiments gone wrong sounds like a bad combo doesn't it, and truly it was so and led to the deaths of two scientists within the span of 1 year.

Criticality tests are experiments performed on radioactive materials to observe them in near supercritical state, supercritical state being one in which a sustained nuclear reaction in possible. The experiments that I'm going to talk about here did this by shielding the core with neutron reflective material, causing it to reach near critical levels if the shielding can be controlled.

The first experiment took place on August 21, 1945. Physicist Harry Daghlian was working alone, stacking tungsten carbide bride around the core to help it reach criticality. The picture below mimics the setup.
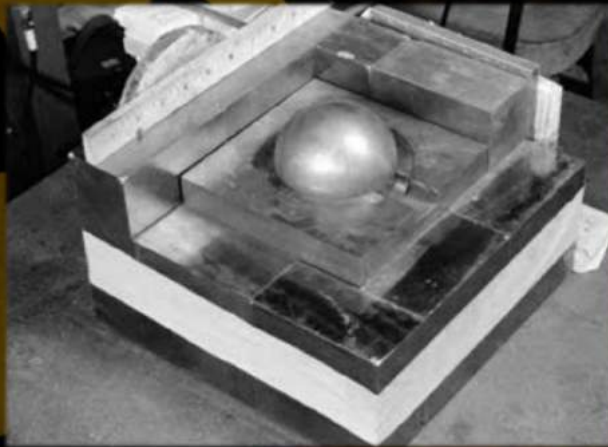
While putting the bricks, Daghlian accidentally dropped a brick on the sphere, causing it to go supercritical. He quickly removed the brick within seconds, but it was too late. The dose of radiation he received were fatal enough and he later died 25 days after the accident at an age of 24. In the lab another security guard was present at the time of the accident, sitting 3 to 4 meter away. He survived for another 33 years, succumbing to leukemia at the age of 62.

You would think that such an accident would stop people from carrying on the work on the demon core. But it was the opposite. Daghlian's colleague Louis Slotin, who comforted Daghlian on his death bed, continued performing experiments on the core and this time in a more unsafe manner.

The setup this time was different. Instead of bricks, Stolin used two half spheres of Beryllium to encase the demon core, with a little gap between them. The smaller this gap became, further closer to criticality was the core pushed. However Stolin refused to use a shiv used to prevent the code form completely closing, instead using a Flathead screw driver which he moved with his hand to control the upper half of the sphere as seen in the picture above, replicated later. On May 21, 1946, the screwdriver slipped from Stolin's hand, causing the core to become critical and exposed him and other scientists to high dosage of radiation before Stolin threw the top half sphere. One of the scientists present said Stolin's first words after the accident was "Well, that does it". Louis Stolin passed away 9 days, merely 9 months after his colleague from a similar accident involving the core.

After these fatalities, the plutonium core originally named "Rufus" came to be known as the "Demon Core". Further such manual criticality experiments were stopped, and were later carried out using remote cameras and machines. The Demon Core was scheduled for a test later, but was ultimately melted and repurposed into many other cores of plutonium.

Soumyadeep Bhattacharya
3rd Year

Fun Time!!!!

Solve the Rebus puzzles

1.
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D
N
A    ,D
T
S
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2. JANOB

3. (√−1/64)

4. HOROBOD

5.
GOT   HEROES   HEROES
GOT   HEROES   HEROES
GOT   HEROES   HEROES
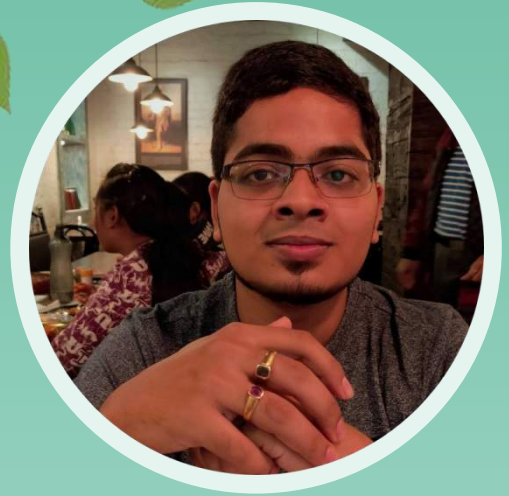GOT   HEROES   HEROES

Answers

1. Stand-up comedy 2. Inside job 3. I overate 4. R obin hood 5. Forgotten Heroes

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