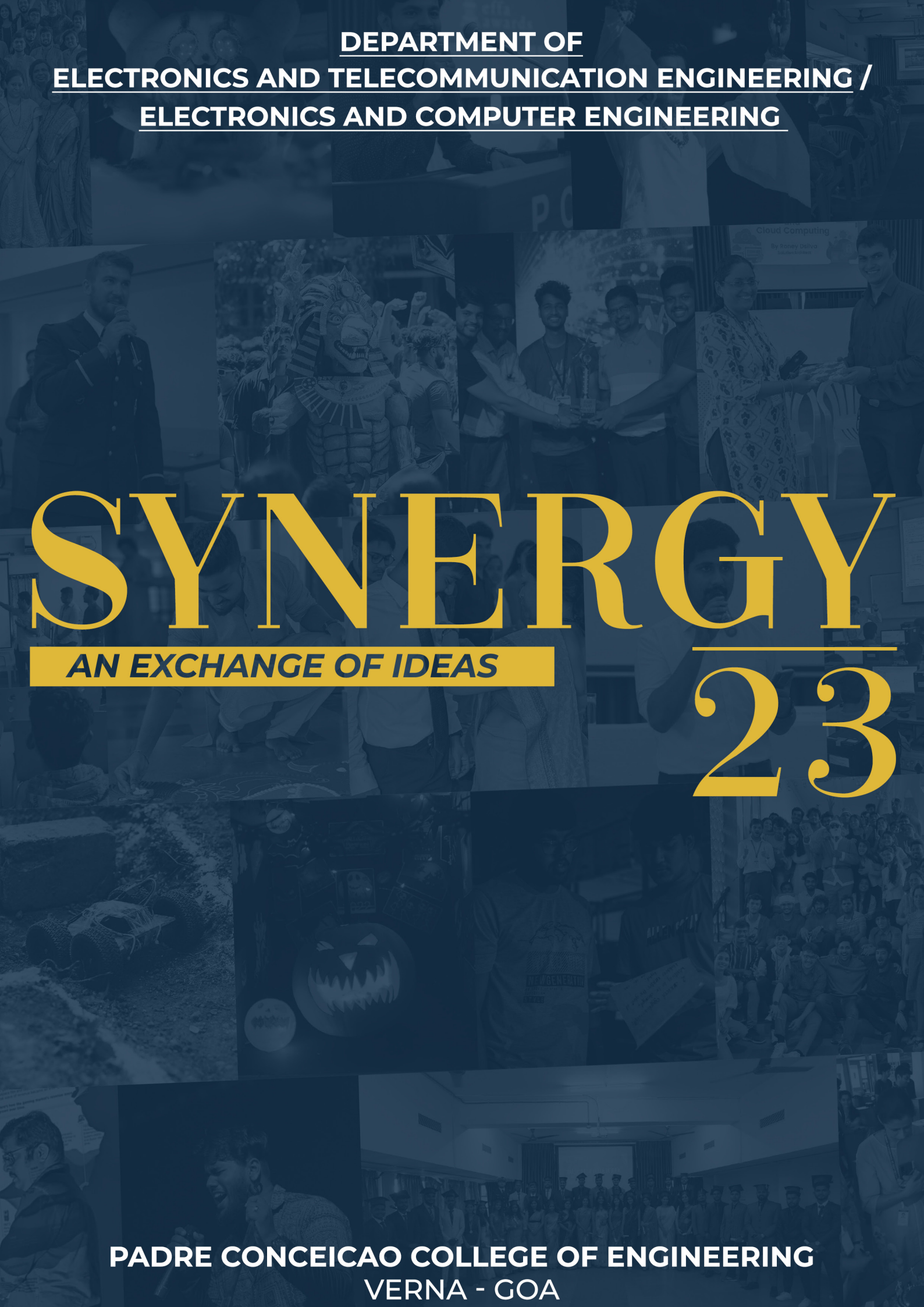

DEPARTMENT OF
ELECTRONICS AND TELECOMMUNICATION ENGINEERING /
ELECTRONICS AND COMPUTER ENGINEERING

SYNERGY 23

AN EXCHANGE OF IDEAS

PADRE CONCEICAO COLLEGE OF ENGINEERING
VERNA - GOA

EDITOR'S NOTE

"I am delighted to address you as the editor of "SYNERGY 2023" representing the Exactas Council and our esteemed department. It has been an incredible experience curating this magazine, focusing on achievements and reports closely related to our council and department.

Throughout this journey, I have had the privilege of highlighting the outstanding accomplishments of our students and the significant milestones reached within our academic community. The opportunity to share these stories of success and progress has been truly inspiring.

As a student-driven publication, This magazine serves as a testament to the remarkable achievements and initiatives undertaken by our council. It is a platform that allows us to celebrate the dedication, hard work, and contributions of our fellow students.
Looking ahead, I am excited to continue showcasing the extraordinary accomplishments and endeavors of our Exactas Council and department.

Thank you for being a part of this remarkable journey!"

Shama Ghatwal, FE ECOMP

MESSAGE FROM THE
GENERAL SECRETARY

"As the General Secretary of the Exactas Student Council, I am honored to address you all. Our council strongly believes in the power of togetherness, striving for excellence in every endeavor, and working unitedly for the betterment of our department.

We are a collective force driven by a shared vision to achieve greater heights in every event, initiative, and undertaking. Together, we embody the spirit of collaboration, cooperation, and unity.

I encourage each and every one of you to actively engage with our council's initiatives, events, and projects. Let us stand together, shoulder to shoulder, as we work towards our common goals, nurturing an environment where every student can thrive and succeed.

Your dedication and support have been crucial to our success. I invite you to actively engage with our initiatives, events, and projects as we work towards common goals and create an inclusive academic community.

Thank you for being part of our united journey towards excellence!"

Sufiyan Munshi, SE ECOMP

TABLE OF CONTENT

INTRODUCTION TO

EXACTAS

"The Electronics And Computer Association of Students (EXACTAS) represents the entire student community at the Department of Electronics and Computer Engineering.

The goal is to bridge the gap between students, faculty, and the administration, ensuring that the students' opinions are valued and enhancing education, personal growth, and sense of belonging.

EXACTAS ensures that the learning experience of the students is coupled with adequate amount of extracurricular activities needed to create an all-round exposure for the students, giving them opportunities to excel in various activities.

EXACTAS will be responsible for organizing events to foster a supportive and inclusive environment where every student can thrive leading to developing leadership skills.

EXACTAS aims to create a better student community where every student's voice is heard and respected."

Asst Prof. Sanjeet Shet Kanekar

INTRODUCING

EXACTAS

FACULTY COMMITEE

SANJEET KANEKAR

RAKSHA SINGBAL

STUDENTS COMMITEE

SHUBHAM BHALERAO
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SHAMA GHATWAL
MAGAZINE SECRETARY

INAMUL SHAIKH
FE EXECUTIVE

AMAN BHANDARE
SE EXECUTIVE

MELROY PERIERA
TE EXECUTIVE

SHUBHAM NAIK
BE EXECUTIVE

EXACTAS INSTALLATION

CEREMONY

The Installation ceremony of EXACTAS and RACE club took place in the PCCE auditorium on Thursday, 20th October 2022. At the installation all the council members were introduced, followed by an oath ceremony. Ms. Akshata Alornekar, HR manager at SJ innovations was invited as the chief guest and speaker. She held an amazing seminar on the Roadmap of getting Interview. This session helped the students get the required knowledge and cognition, along with a demo interview to be industry ready. Finally delicious snacks were provided for all the exactas members.

STAFF ACHIVEMENTS

Dr. Anuja Naik
Awarded PHD in September 2022
Congratulations on completing your PhD! Your hard work, dedication, and expertise have paid off. You've made significant contributions to your field and are ready to embark on new opportunities.

Ms. Sneha Kamble
Published research paper in Adhoc Network journal, March 2023
Congratulations on your paper publication in the journal! Your hard work and valuable research have been recognized by the academic community. This achievement showcases your expertise and contributes to the advancement of knowledge in your field.

FACULTY DEVELOPMENT PROGRAM ON "RECENT TRENDS IN MACHINE LEARNING, COMPUTER VISION AND DATA SCIENCE"

FDP was conducted from 23rd to 28th January 2023 approved by the Indian Society for Technical Education (ISTE) and conducted in association with the Department of Science and Technology and Waste Management (DST&WM).

The FDP covered the latest trends of research in Machine learning, Computer Vision, and Data science. The participants that comprised of faculty members, research scholars from all over Goa, provided positive feedback regarding the knowledge gained during the course of the FDP.

STAFF ACHIVEMENTS

REFRESHER COURSE ON "CODE YOURSELF: AN INTRODUCTION TO C PROGRAMMING"

Refresher course was conducted for SE ECOMP students from 13th-17th Feb 2023 by Assistant Professor Sanjeet Kanekar who taught fundamental concepts like functions, data types, pointers, files, arrays etc of programming during the theory sessions and Assistant Professor Sneha Kamble conducted lab sessions for the same.
The Course was relevant to the title and was well-appreciated by the students. After completion of this course students have felt encouraged to explore these areas further.

INTERNATIONAL COLLABORATION INTERNSHIP

The Electronics and Computer Engineering Department in association with Research, Development, and Consultancy Centre, collaborated with Lucas Preston Bauer, second Lieutenant in the Pilot Corp of French Air and Space Force, for a 4 month research internship at the Padre Conceicao College of Engineering, Verna, Goa from February to June 2023.

Lucas worked in the domain of Resource Allocation for Joint Satellite and Terrestrial Communication Systems under the supervision of Shailesh Khanolkar and Rohini Korti.

STUDENT ACHIVEMENTS

Aditi Chodankar, SE ECOMP
Represented Goa in 84th Senior National and Interstate TT Championship, March 2022 held at Jammu. She also represented Goa University in West Zone Interuniversity TT Championship held at University of Mumbai in Dec 2022.
Congratulations on your achievements.Your skill and dedication have brought you this far. Keep up the great work and good luck in the upcoming matches!

Keegan Barreto, SE ECOMP
Congratulations on securing first place in “Drop the Beat” at INSPIRUS 2022 Organised by Don Bosco College of Engineering and second in “War of DJs” at Meteroa, DBC, Panjim Feb 2023 and vrious other cultural events. Embrace this moment of triumph and let it fuel your future endeavors.

Vipul Talekar, SE ECOMP
Congratulations on securing third place in Flag Painting at Meteroa, DBC, Panjim Feb 2023 and second place in Wall Painting at Tathastu, Chowgule College, March 2023. Your artistic skills and creativity have been recognized. Well done on your impressive achievements!

Aman Bhandare, SE ECOMP
Congratulations on securing first place in ROBOSUMO at resonance Organised by GEC, May 2023. Your robotics skills and strategic thinking have propelled you to the top. Well done on this outstanding achievement!

Varad Naik, SE ECOMP
Congratulations on securing second place in Line follower at Quark Organised by BITS Pilani Goa, April 2023. Your impressive skills and precision have led you to victory. Well done on this outstanding achievement!

Aditya Keni, Saanvi Bandekar, Ritika Naik, Mayuresh Kajolkar, Mohammad Kaif, Vidhi Kumbharjuvekar, Shweta Kumari fcrom SE ECOMP and Inamul Shaikh from FE ECOMP.

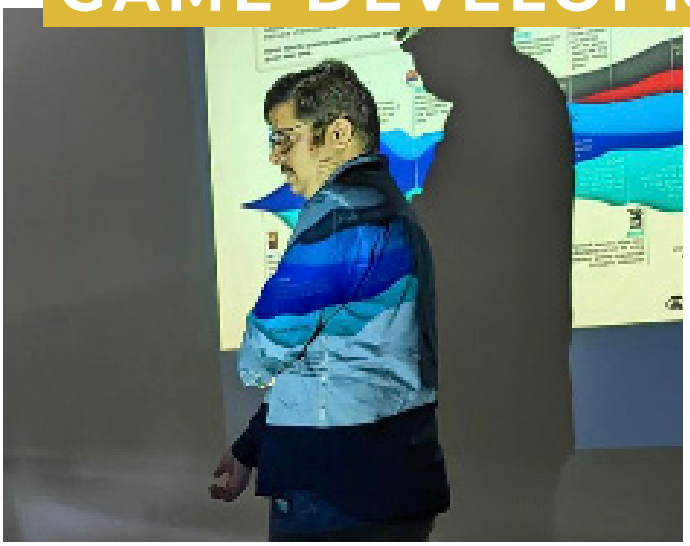
Congratulations to all for securing third place in various group dance events at Tathastu, Meteroa organised by Tathastu, Chowgule College, March 2023 and DBC, Panjim Feb 2023 respectively.
Your synchronized performances and artistic talent have earned you this recognition. Well done on this collective achievement!

Adam Trinidad, Evozeno Diniz (SE ECOMP)
Congratulations for securing first place in Call Of Duty at Techyon, PCCE Verna and MES College Vasco.
Varad Kerkar (SE ECOMP)
Congratulations for securing first place in Valorant Tournament, Meteroa, DBC, Panjim Feb 2023

Sarvesh Lad, Shubham Bhalerao, Ryan Fernandes, BE ETC
Congratulations on securing second place in the project idea competition “ThinkTech 2k22”, a national level competetion Organised by Don Bosco College of Engineering. Your innovative thinking and teamwork have paid off. Keep up the great work!

SEMINARS & WORKSHOPS

GAME DEVELOPMENT WORKSHOP



The Department of Electronics and Computer Engineering in association with SCADA organised a Game Development workshop in Unreal Engine on 10th March, 2023. The workshop was conducted by Mr Hrishikesh Andurlekar, founder of Tplusplus Interactive and a mentor at Mastered the United Kingdom. The main objective of the workshop was to help provide students with a hands-on experience in creating a game from scratch along with various techniques for the same. Students were able to procure the basic idea related to designing of a game.

CYBERSECURITY AND CLOUD COMPUTING

The Department of Electronics and Computer Engineering in association with **EXACTAS** organised a session on **"Cybersecurity and Cloud Computing"** on 21st of April 2023 at PCCE.

The session was conducted by Mr. Roney D'silva, Solutions Architect at Codemax Solutions Pvt Ltd.

The students acquired a good understanding behind the basic idea and working involved in cybersecurity and cloud computing.

PCCE IDEA TANK

The department of Electronics and Computer Engineering in association with **EXACTAS** organised a State Level project idea competition, **"PCCE Idea Tank"** on 10th March, 2023.The competition was aimed at providing students with a platform to present their innovative and resourceful ideas. The three esteemed judges of the PCCE Idea Tank competition were: Fenil Salgaonkar: Founder memeber and Director of Scada Sanjay Mulvi: Head of Seed fund and Incubation in Ciba Shiddesh Shirodkar: Techincal lead at SJ innovations. The participants discussed ideas such as dream reality: a virtual reality based architecture,Iot based dysomenorrhea reliever and posture support belt,a virtual reality based theurapatic device and many such creative ideas.The competition witnessed participation of over 40+ groups, out of which the following bagged the top 3 positions: First Place - Team Medtech Second Place - Team Auto junction Third Place - Team Dream Reality.

LAUNCHPAD 2.0

The department of Electronics and computer engineering in collaboration with SJ innovation organized LAUNCHPAD 2.0, a seminar which was conducted on 9th November, 2022. The seminar was held at 10:30 am in PCCE auditorium.The seminar aimed to highlight few topics such as software development and programming language, software testing and it's myths, personal development session, and current trends in IT . This talk was given by Mr.Shahedul Islam, CEO of Sj innovation followed by talks from SJI tech leads.This seminar was very helpful and informative for the students and helped them to gain an understanding of the IT industry

VFX WORKSHOP

BY SCADA

COMPUTER VISION AND AI FOR AGRICULTURE

RACE Club of Department of **Electronics and Computer Engineering, of Padre Conceicao College of Engineering** organized a seminar on **"Computer Vision and AI for Agriculture"** by Dr.Manya Afonso on 10th May 2023.

Dr. Afonso is currently a researcher at the Biometris (Applied Mathematics and Statistics) and Agro Food Robotics groups at Wageningen University and Research Center, the Netherlands.

The seminar aimed to discuss the applications of computer vision and artificial intelligence in the field of agriculture and the potential benefits that could be derived from them.

Dr. Afonso began the seminar by providing an overview of the current challenges faced by the agriculture industry. He then introduced the audience to the concept of computer vision and explained how it could be used to identify and analyze agricultural data such as plant health, soil moisture, and crop growth. He also highlighted the potential benefits of using artificial intelligence to optimize resource use, reduce waste, and increase sustainability.

Dr.Manya encouraged the students to participate for all the different challenges that are held at Wageningen University & Research Netherland.

The seminar was well-attended and sparked lively discussions among the participants. There we about 75 participants from second and third year, ECOMP department.

STUDENT'S CORNER

Developing Self-Discipline: Habit for a More Productive Life

Self-discipline is the ability to make yourself do what you should do when you should do it, whether you feel like it or not. As stated by Albert Hubbard, it's an essential skill that allows us to align our actions with our goals, overcome obstacles, and achieve success, even when they are difficult or uncomfortable.

Let's take a moment to talk about everyone's favourite boy wizard, Harry Potter. Did you know that his creator, J.K. Rowling, wasn't always a household name? Before she became a successful author, J.K. Rowling was a struggling single mother living on welfare. She had an idea for a children's book about a young wizard, but it took her seven years to write the first Harry Potter book, Harry Potter and the Philosopher's Stone.

During those seven years, J.K. Rowling faced many challenges and setbacks. She struggled with depression and anxiety, and her manuscript was rejected by multiple publishers. However, she remained disciplined and committed to her writing, working on her book every day, even when she didn't feel like it.

J.K Rowling also developed a strict routine to help her stay focused and productive. She would take her daughter to school, then go to a local café to write for several hours before returning home to care for her daughter. She also avoided distractions, such as television and the internet, and set specific writing goals for herself to meet each day.

Finally, J.K. Rowling's dedication and hard work paid off. Her first book was published in 1997 and became an instant success, launching a series of seven books that sold over 500 million copies worldwide. J.K. Rowling went from being a struggling single mother to a multi-millionaire and one of the most successful authors in history.

That's just one example of the power of self-discipline in action. But how can we incorporate this kind of discipline into our own lives? The good news is, it doesn't have to be an all-or-nothing proposition. In fact, small changes can add up to big results over time. By starting with manageable goals and building a routine that supports our efforts, we can begin to cultivate the kind of self-discipline that leads to success.

Here are a few tips to get started...

1. **Start with small goals:** Instead trying to completely overhaul your life overnight, start by setting small goals for yourself. For example, commit to waking up 10 minutes earlier each day or doing 5 minutes of exercise every morning.

2. **Create a routine:** Once you've set your goals, create a routine that will help you stick to them. Block off specific times in your day for activities like exercise, writing, or practicing a new skill.

3. **Hold yourself accountable:** One of the keys to self-discipline is holding yourself accountable for your actions. Keep track of your progess towards your goals, and if you slip up, don't beat yourself up about it - just recommit and try again.

4. **Find sources of motivation:** Self-discipline can be challenging, so it's important to find sources of motivation to keep you going. This might mean finding a workout buddy, joining a writing group, or following social media accounts that inspire you.

5. **Celebrate your successes:** Finally, don't forget to celebrate your successes along the way. Every time you achieve one of your goals, take a moment to acknowledge your hard work and feel proud of yourself. This will help you build momentum and stay motivated to continue practicing self-discipline in your daily life.

Although these strategies may seem straightforward, putting them into practice can be challenging. It's important to remember that building self-discipline is a process that takes time and effort. Don't be discouraged if you stumble along the way – it's natural to have days when you struggle to keep up with your routine. Instead, be patient and compassionate with yourself. Remember that the goal is progress,

not perfection. If you miss a day, simply regroup and try again the next day. Over time, these small steps can add up to meaningful change and a stronger sense of self-discipline.

It's also important to recognize that self-discipline is not a one-size-fits-all approach. What works for one person may not work for another. It's essential to experiment with different strategies and find what works best for you. Additionally, self-discipline is not a fixed trait that you either have or don't have. It's something that can be developed and strengthened over time with consistent practice.

One common misconception about self-discipline is that it requires willpower and the ability to deny oneself pleasure. However, this is not necessarily true. While self-discipline often involves making choices that may be uncomfortable or difficult in the short term, it's ultimately about prioritizing our long-term goals and values over our immediate desires. By aligning our actions with our values and goals, we can create a sense of purpose and meaning in our lives.

In conclusion, self-discipline is an essential skill for achieving success in all areas of life. It involves intentionally focusing on our goals and committing to consistent practice, even when it's difficult or uncomfortable. By starting with small goals, creating a routine, holding ourselves accountable, finding sources of motivation, and celebrating our successes, we can develop the habits and mindset necessary to achieve our goals over the long term. Remember that building self-discipline is a process that takes time and effort, but with patience and persistence, we can unlock our full potential and achieve more than we ever thought possible.

MITALI KODKANI
BE ETC

Advancement of AI in Healthcare

Artificial intelligence has been making significant progress in many industries, and healthcare is no exception. In recent years, AI has been increasingly applied to healthcare to improve patient outcomes, increase efficiency, and reduce costs. Here are some of the most significant advancements in AI in healthcare.

One of the most promising areas of AI in healthcare is in the analysis of medical images. AI algorithms can be trained to detect patterns and anomalies in images such as X-rays, Ultrasound, MRI scans, and CT scans. This can help radiologists to identify potential problems much earlier and with greater accuracy than is possible with traditional methods. It can also help reduce the workload of radiologists, allowing them to focus on more complex cases.

Another promising application of AI in healthcare is in the field of drug development. Drug development is an expensive and time-consuming process that can take many years to complete. AI can be used to analyze vast amounts of data from clinical trials and other sources to help identify promising drug candidates more quickly and efficiently. AI can also be used to predict potential side effects of drugs and to identify patients who are most likely to benefit from a particular treatment.

AI is also being used to help healthcare providers personalize treatment plans for individual patients. By analyzing patient data such as medical history, genetics, and lifestyle factors, AI algorithms can help healthcare providers identify the most effective treatments for each patient. This can help reduce the likelihood of adverse reactions to treatment and improve patient outcomes.

In addition to improving patient outcomes, AI can also help reduce costs in healthcare. By automating routine tasks and reducing the workload of healthcare providers, AI can help reduce the overall cost of healthcare. It can also help reduce the likelihood of errors and improve the accuracy of diagnoses, which can further reduce costs.

However, there are some challenges to the widespread adoption of

AI in healthcare. One of the biggest challenges is ensuring the privacy and security of patient data. Healthcare providers must ensure that patient data is kept confidential and secure, and that AI algorithms are developed in an ethical and responsible manner.

In conclusion, the advancement of AI in healthcare has the potential to revolutionize the way we approach healthcare. By improving patient outcomes, increasing efficiency, and reducing costs, AI can help make healthcare more accessible and affordable for everyone. However, it is essential that we address the challenges of privacy, security, and ethics to ensure that the benefits of AI are realized in a responsible and ethical manner.

AKHILESH DEVSEKAR
BE ETC

Technology

Technology has become an integral part of our daily lives, affecting everything from the way we communicate to the way we work and even how we entertain ourselves. From smartphones to social media, technology has revolutionized the way we interact with the world and with each other. One of the most significant impacts of technology is the way it has transformed communication. With the rise of smartphones and social media, we can now communicate with people from all over the world in real-time. We can share our thoughts, ideas, and experiences with others instantaneously,breaking down barriers that were once thought to be insurmountable.

In addition to communication, technology has also revolutionized the way we work. With the rise of remote work, people can now work from anywhere in the world, as long as they have a reliable internet connection. This has allowed for greater flexibility and freedom in the workplace, as well as reduced commuting times and costs.
Moreover, technology has also played a significant role in the entertainment industry. With the rise

of streaming services such as Netflix and Amazon Prime Video, people can now watch their favorite TV shows and movies on demand, whenever and wherever they want. This has disrupted traditional media channels, such as cable TV, and created new opportunities for content creators and distributors.

However, with all the benefits of technology come some downsides. One of the major concerns is privacy and security. With the amount of personal information that we share online, there is a risk of that information falling into the wrong hands. Cyber attacks and data breaches are becoming increasingly common, and it is important for individuals and organizations to take steps to protect their data.

Another concern is the impact of technology on jobs. While technology has created new job opportunities, it has also led to the displacement of certain jobs. Automation and artificial intelligence have the potential to replace human workers in many industries, which could lead to high levels of unemployment in the future.

In conclusion, technology has had a profound impact on our lives, revolutionizing the way we communicate, work, and entertain ourselves. While there are certainly concerns about privacy and job displacement, technology has the potential to continue to create new opportunities and transform our world in exciting ways. It is up to us to ensure that we use technology responsibly and take steps to mitigate any negative effects that may arise.

ADAM
SE ECOMP

The Next Tech-Frontier

We know that technological advances have already brought endless benefits to the medical field. However, it seems that in the field of neuroscience and mental disorders, no great milestones have been reached so far. Instead, there are more sophisticated resources for studying the brain, such as magnetic resonance imaging (MRI). In recent years, new technologies combined with state-of-the-art computational analysis, modelling, and artificial intelligence have changed many things. For example, we can see what's going on in many mental disorders at the neurological level. Neuro-technologies aim to improve the health and potential of the human brain. This area is attracting increasing interest and investment from large companies. We intend to examine below some future developments in this field, which, as we mentioned earlier, are non-invasive resources.

1.Biomarkers of Chronic Pain and Depression:
Artificial intelligence added to electroencephalography (EEG) and Big Data will soon allow for better diagnoses. For example, a patient will only need to wear a cap with different electrodes to get an accurate picture of his brain activity.

2. Brain Stimulation to cure Depression in Young People:
Deep brain stimulation is a method already being used successfully to treat major depression. However, there is one group of patients that needs more attention. In their case, often neither psychological nor pharmaceutical therapy brings any improvement.

These are young people between the ages of 16 and 24 with depression and suicidal behaviour. Therefore, experts have developed a device that stimulates the dorsolateral prefrontal cortex. This technique, added to cognitive exercise sessions, reduces symptoms associated with depression.

3. Assistive Brain Devices:
Companies such as Medtronic, Neuropace, and St. Jude Medical have developed technologies that can change the quality of life for many people. While we usually think only of Elon Musk's Neuralink project, the truth is that many

organisations are working on specific advances that will soon see the light of day.One such project is the creation of brain devices that prevent epileptic seizures. There will also be technologies that, through continuous monitoring, will improve the administration of specific medications based on the patient's needs.

4. Treating Injuries using Virtual Reality:

Other neuro-technologies already used in psychological therapy are those related to virtual reality. Currently, they are extremely useful in treating phobias and dementia, and in treating children with autism spectrum disorders (ASD). Soon, however, another step is to be taken.

In a few years, virtual reality technology combined with brain stimulation will be developed to treat patients with post-traumatic stress disorder. Through gradual sessions, the method will seek to negate the negative effects of adverse events.

5. Video Games for Cognitive Training:

Most of us play games on our cell phones to train our memory. These are useful resources for the elderly because they facilitate good cognitive stimulation. This is an important area of neurotechnology, and it undoubtedly helps to understand why specialised video games are being developed for this purpose. Cognitive training to improve fluid intelligence, as well as working memory, is a resource that will soon be within our reach.

6. Devices for Concentration and Self-Regulation:

In an increasingly stimulating and multitasking world, attention is beginning to fade in people. As a result, we now find it difficult to concentrate our mental resources on single activities. Concentration is exhausting, and our thoughts tend to wander. This feeds stress and feelings of low productivity. Wearable technologies like watches or headphones will soon begin to have a different purpose. Experts are designing devices that improve our attention span and promote calmness and emotional self-regulation. Does this mean the end of anxiety? We will have to wait and see.

7. Brain-Computer Interfaces:

Brain-Computer Interface (BCI) systems already exist. They consist of interfaces that connect the human mind to a computer, translate

its thoughts and transmit them to electronic devices. We know this may sound like science fiction, but if we want to understand their usefulness, we need to analyse what they consist of. These new technologies detect and decode the electrical activity of neurons. They then send messages to a device that performs a specific action. In effect, brain-computer interfaces are neuro-technologies that realise the rehabilitation of lost functions.

CONCLUSION:

Currently, some neuro-technologies are already part of many therapeutic and medical communities. But in the future, there will be new and unique resources whose sole purpose will be to improve our quality of life in many areas. This is the best goal of all, and while it may have seemed magical before, it is likely to come true sooner than we might think.

DEVANSHI
SE ECOMP

BIOCHIPS

Biochip, small scale device, analogous to an integrated circuit, constructed of or used to analyse organic molecules associated with living organisms. In molecular biology, biochips are engineered substrates ("miniaturized laboratories") that can host large number of simultaneous biochemical reactions. One of the goals of biochip technology is to efficiently screen large number of biological analytes, with potential applications ranging from disease diagnosis to detection of bioterrorism agents. Digital microfluid biochips are one of its examples that are under investigation for application in biomedical fields. In a microfluidic biochip, a group of adjacent cells in the microfluidic array can be configured to work as storage, functional operations as well as for transporting fluid droplets dynamically.

History

The development started with early works on sensor technology. One of the first portable, chemistry-based sensors was the glass pH electrode, invented in 1922 by Hughes. In 1953, Watson and Crick announced their discovery of double helix structure of DNA molecules which

was the start of genetics research that is still continued in the present day. The development of sequencing techniques in 1977 by Gilbert and Sanger enabled researchers to read genetic codes directly that provides instructions for protein synthesis. This showed how hybridization of complementary single oligonucleotide strands could be used as basis for DNA. In 1983 Kary Mullis invented the polymerase chain reaction (PCR) technique, a method of amplifying DNA concentrations which made possible the detection of extremely small quantities of DNA in samples. In 1986 Hood and his co- workers devised a method to lable DNA molecules with flourescent tags thus enabling hybridization experiments to be observed optically. These two developments enabled the technology used in modern DNA-based.

The multiple technologies needed to make a successful biochip- from sensing chemistry, to microarraying, to signal processing- require a true multidisciplinary approach, making the barrier to entry sleep. One of the first commercial biochips was introduced by Affymetrix. Their "GeneChip" products contain thousands of individual DNA sensors which are used for sensing defects or single nucleotide polymorphism (SNPs), suppressed tumors etc. The chips are produced using Microlithography techniques traditionally used to fabricated integrated circuits.

Application

Biochip analytical technology shows high throughput property for multi-samples measurement, so can reduce the required amount of samples and time used for determination. This technology has quickly developed in recent years and has been applied in medical diagnosis and other analytical areas including gene chips, protein chips, lab-on-a-chip, tissue microarray, cell microarray, and carbohydrate microarray and so on.

Advantages

- Used to rescue the sick.
- To find lost people, find person uniquely.
- To locate downed children and wandering Alzheimer's Patients.
- They can perform thousands of biological reactions operations in few seconds.
- In monitoring health condition of individuals in which they are specifically employed.

Disadvantages

- They raise critical issues of personal privacy.
- They mark the end of human freedom and dignity.
- They may not be supported by large percentage of people.
- There is a danger of turning every man, woman and child into a controlled slave.
- They can be implanted into one's body without their knowledge.

Protein biochip array and other microarray technologies

Microarrays are not limited to DNA analysis; protein microarrays, antibody microarray, chemical compound microarray can also be produced using biochips. Randox Laboratories Ltd. launched Evidence, the first protein Biochip Array Technology analyzer in 2003. In protein Biochip Array Technology, the biochip replaces the ELISA plate or cuvette as the reaction platform. The biochip is used to simultaneously analyze a panel of related tests in a single sample, producing a patient profile. The patient profile can be used in disease screening, diagnosis, monitoring disease progression or monitoring treatment. Performing multiple analyses simultaneously, described as multiplexing,allows a significant reduction in processing time and the amount of patient sample required. Biochip Array Technology is a novel application of a familiar methodology, using sandwich, competitive and antibody-capture immunoassays. The difference from conventional immunoassays is that, the capture ligands are covalently attached to the surface of the biochip in an ordered array rather than in solution. In sandwich assays an enzyme-labelled antibody is used; in competitive assays an enzyme-labelled antigen is used. On antibody-antigen binding a chemiluminescence reaction produces light. Detection is by a charge-coupled device (CCD) camera. The CCD camera is a sensitive and high-resolution sensor able to accurately detect and quantify very low levels of light. The test regions are located using a grid pattern then the chemiluminescence signals are analysed by imaging software to rapidly and simultaneously quantify the individual analytes. Biochips are also used in the field of microphysiometry e.g. in skin-on-a-chip applications.

-ANJANA P A
TE ETC

The Future of Computing Is Here: Quantum computing

What Is Quantum Computing?

Quantum computing is an area of computer science that uses the principles of quantum theory. Quantum theory explains the behavior of energy and material on the atomic and subatomic levels.

Quantum computing uses subatomic particles, such as electrons or photons. Quantum bits, or qubits, allow these particles to exist in more than one state (i.e., 1 and 0) at the same time.

Theoretically, linked qubits can "exploit the interference between their wave-like quantum states to perform calculations that might otherwise take millions of years."

Classical computers today employ a stream of electrical impulses (1 and 0) in a binary manner to encode information in bits. This restricts their processing ability, compared to quantum computing.

Why do we need quantum computers?

For some problems, supercomputers aren't that super.

When scientists and engineers encounter difficult problems, they turn to supercomputers. These are very large classical computers, often with thousands of classical CPU and GPU cores. However, even supercomputers struggle to solve certain kinds of problems.

If a supercomputer gets stumped, that's probably because the big classical machine was asked to solve a problem with a high degree of complexity.

Features of Quantum Computing

Superposition and entanglement are two features of quantum physics on which quantum computing is based. They empower quantum computers to handle operations at speeds exponentially higher than conventional computers and with much less energy consumption.

- **Superposition:**

According to IBM, it's what a qubit can do rather than what it is that's remarkable. A qubit places the quantum information that it contains into a state of superposition. This refers to a combination of all possible configurations of the qubit. "Groups of qubits in superposition can create complex, multidimensional computational spaces. Complex problems can be represented in new ways in these spaces."

- **Entanglement:**

Entanglement is integral to quan-

tum computing power. Pairs of qubits can be made to become entangled. This means that the two qubits then exist in a single state. In such a state, changing one qubit directly affects the other in a manner that's predictable.

Quantum algorithms are designed to take advantage of this relationship to solve complex problems. While doubling the number of bits in a classical computer doubles its processing power, adding qubits results in an exponential upswing in computing power and ability.

- **Decoherence:**

Decoherence occurs when the quantum behavior of qubits decays. The quantum state can be disturbed instantly by vibrations or temperature changes. This can cause qubits to fall out of superposition and cause errors to appear in computing. It's important that qubits be protected from such Interference by, for instance, supercooled refrigerators, insulation, and vacuum chambers.

Quantum Computer vs. Classical Computer

Quantum computers have more basic structure than classical computers. They have no memory or processor. All a quantum computer uses is a set of superconducting qubits.

Quantum computers and classical computers process information differently. A quantum computer uses qubits to run multidimensional quantum algorithms. Their processing power increases exponentially as qubits are added. A classical processor uses bits to operate various programs. Their power increases linearly as more bits are added. Classical computers have much less computing power.

Classical computers are best for everyday tasks and have low error rates. Quantum computers are ideal for a higher level of task, e.g., running simulations, analyzing data (such as for chemical or drug trials), creating energy-efficient batteries. They can also have high error rates.

Classical computers don't need extra special care. They may use a basic internal fan to keep from overheating. Quantum processors need to be protected from the slightest vibrations and must be kept extremely cold. Super-cooled super fluids must be used for that purpose.

Quantum computers are more expensive and difficult to build than classical computers.

MELROY PEREIRA
TE ETC

FIELD TRIPS

First year students of ECOMP department visited Digisol/Smartlink, Verna. They were accompanied by Asst. Prof. Dr. Anuja J Naik and Asst. Prof. Mansi Raut.

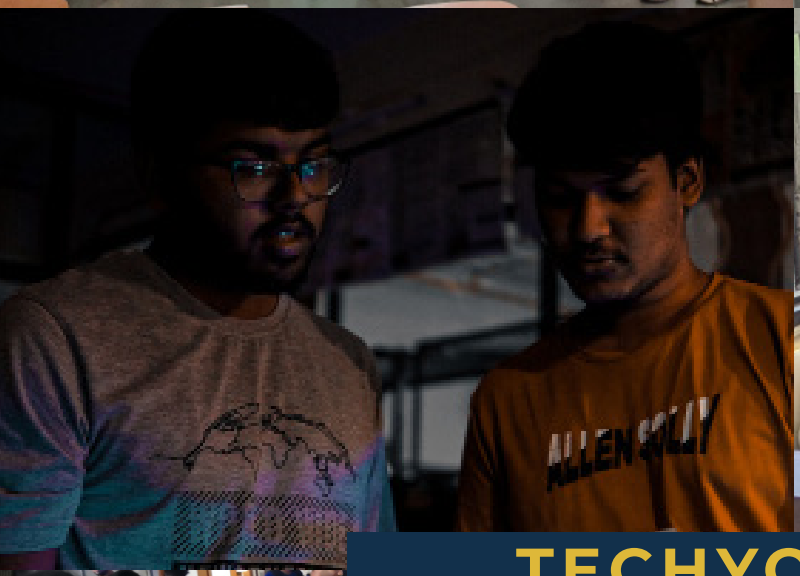
Second year students of ECOMP department visited Commscope, Verna.

Third year students of ETC department visited HFCL, Verna on 21st April 2023. They were accompanied by Asst. Prof. Rohini Korti and Asst. Prof. Raksha Singbal.

Final year students of ETC department visited OPTEL, Verna on 24th April 2023. They were accompanied by Asst. Prof. Sharlaine Nicole Monterio and Asst. Prof. Sneha Kamble.

PHOTO GALLERY





TECHYON 2023




MITHYA 2023


Rise Grind


*#MITHYA
2K23

CELEBRATIONS

TRADITIONAL DAY

Electronics and computer engineering department in collaboration with **EXACTAS** organised the "Traditional Day" to celebrate the festival of lights and prosperity on Thursday, 20th October 2022.

The entire college campus was decorated with lights and diyas. On this special occasion all the students had worn ethnic attires.

To make this day even more interesting, different activities were planned for students and staff members as well. Activities like Inter Class Rangoli Competition, Selfie Competition and Miniature Akash Kandil making were organised for the students. All the students participated with a lot of enthusiasm.

Exciting prizes were awarded to the winners of all these events. And to top it all, a Surprise Fashion Show event was organised.

All the students had a blast!

CHRISTMAS

After all the successful events throughout out the year, PCCE decided to celebrate Christmas on 13th December 2022, to end the year on a high note to represent the colours of Christmas the dress code for this special day was Red, White and Green.

Students from each class made 3-4 stars which were lit up in college. They also made their own beautiful christmas trees using their innovative minds. The Christmas trees were made even more attractive by decorating them with various types of decorations.

This wonderful day was followed by soulful Carol Singing performances by all the departments.

FAREWELL


FAREWELL
FINALLY FINISHED
The Adventure BEGINS
Congrats
WE ARE HIRING!
WE DID IT!
NOW WHAT??

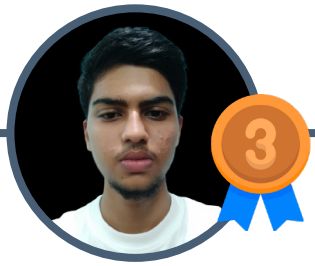
HALL OF FAME

FIRST YEAR (SEMESTER II)

TANISHA SANDESH SHENVI KANTAK

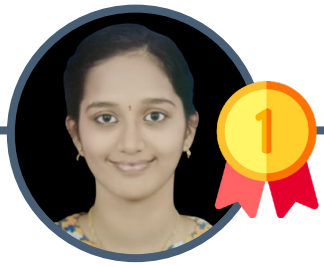
SHARVARI SHASHIKANT BIRJE

RITIKA RAVINDRA NAIK



NOAH PEREIRA

SECOND YEAR (SEMESTER IV)



ANJANA P.A.

ANUSHRI ASHISH REDKAR

ARYA RAGHOBA SHET SHIRODKAR

THIRD YEAR (SEMESTER VI)

SHUBHAM SOPAN BHALERAO

ARYA MAHESH KARAPURKAR

FOUZIYA KAUSAR NAGARCHI

FINAL YEAR

SUKANYA TRIPATHY

RANE MAHISHA RAJENDRA

MARTINS TALITHA MIGDOL

DEPARTMENT OF ELECTRONICS AND TELECOMMUNICATION ENGINEERING / ELECTRONICS AND COMPUTER ENGINEERING

HEAD OF DEPARTNMENT

DR. JAYALAXMI DEVATE

ASSOCIATE PROFESSORS

MR. SHAILESH KHANOLKAR

ASSISTANT PROFESSORS

MS. AVITA LOTLIKAR

MS. SHARLAINE NICOLE MONTERIO

MS. SNEHA MHALSEKAR

MS. ROHINI KORTI

MS. RAKSHA SINGBAL

MS. MAHI ITAGI (CONTRACT)

MR. SANJEET KANEKAR (CONTRACT)

MR. SATISH GANGAVATI (CONTRACT)

MS. SNEHA KAMBLE (CONTRACT)

NON TEACHING STAFF

MR. SANTOSH TARI

MS. LIZZIE FERNANDES

MS. MERLYN DSOUZA

MS. SUZETTE DOURADO

MR. RAGHU BILLAVA