Shri Shamrao Patil (Yadravkar) Educational & Charitable Trust's

Sharad Institute of Technology, College of Engineering

YADRAV (ICHALKARANJI)-416121

(An Autonomous Institute)

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(Approved by AICTE, New delhi, recognized by Government of Maharashtra and Affiliated to Dr. Babasaheb Ambedkar Technological university, Lonere)

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DEPARTMENT OF ELECTRONICS AND COMPUTER ENGINEERING

Techincal Magazine

AY 2023-24

Department of Electronics and Computer Engineering

Welcome to the Department of Electronics and Computer Engineering, as we stand at the intersection of rapid technological advancement and unprecedented connectivity, the field of Electronics and Computer Engineering (ECE) continues to be a driving force in shaping our world. From the development of sophisticated artificial intelligence algorithms to the creation of cutting-edge semiconductor devices, ECE professionals are at the forefront of innovation, pushing the boundaries of what is possible.

In this issue, we explore the latest breakthroughs and trends that are redefining the landscape of electronics and computer engineering. Our featured articles delve into the emerging technologies transforming industries, such as the Internet of Things (IoT), quantum computing, and 5G communications. We highlight how these advancements are not only enhancing our daily lives but also paving the way for new business models and economic opportunities.

We also take a closer look at the ethical considerations and societal impacts of these technologies. As engineers, it is our responsibility to ensure that our innovations contribute to the greater good, promoting sustainability, security, and inclusivity. Through thoughtful design and careful implementation, we can address the challenges posed by issues such as data privacy, cyber threats, and environmental sustainability.

As we navigate this exciting era, collaboration and continuous learning remain key. We encourage our readers to engage with the diverse perspectives and ideas presented in this magazine, and to participate in the vibrant discussions that will shape the future of ECE. Together, we can harness the power of technology to build a smarter, more connected, and more resilient world.

Thank you for joining us on this journey. We hope this issue ignites your passion for innovation and inspires you to push the boundaries of what is possible in Electronics and Computer Engineering.

Happy reading!

MESSAGE FROM HON. EXECUTIVE DIRECTOR

I am very happy to know that Sharad Institute of Technology is bringing out the of technical Magazine for the year 2023- 2024. Sharad Institute of Technology has made all efforts towards the core areas of excellence in latest multidisciplinary technology with aiding efforts. I am sure that this technical magazine play important role to update students with latest technologies in the globe. Wish you all the best.

Shri. Anil Bagane
Executive Director
SITCoE, Yadrav

MESSAGE FROM PRINCIPAL

  I am extremely pleasant to know that Electronics and Computer Engineering department publish technical magazine. I congratulate HoD, faculty and students of Electronics and Computer Engineering department to publish of technical magazine. I appreciate all of you for working together as a team.

I wish a very best of luck to the team of Technical Magazine.

<div align="right">

Dr. S. A. Khot
Principal
SITCoE, Yadrav

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MESSAGE FROM HOD

Greetings to all readers,

As the Head of the Department of Electronics and Computer Engineering, I am delighted to welcome you to this latest edition of our technical magazine. Our field stands as a cornerstone of modern technology, influencing every aspect of contemporary life, from healthcare and transportation to communication and entertainment. It is within these pages that we celebrate the remarkable strides our students, faculty, and industry partners are making in advancing this dynamic discipline.

As you peruse this magazine, I hope you find inspiration in the stories of innovation, dedication, and collaboration. I encourage you to engage with the content, participate in the ongoing discussions, and share your thoughts and ideas. Together, we can continue to drive progress and make a meaningful impact through the field of Electronics and Computer Engineering.

Thank you for your continued support and interest in our department.

Warm regards,

Dr. P. S. Patil
Head of E & C Dept.
SITCoE, Yadrav

MESSAGE FROM EDITOR

It is my pleasure and great privilege to publish technical magazine. Technical magazine be a snapshot of the various multidisciplinary technologies associated with   Electronics and Computer Engineering. We would like to place on record our gratitude and heartfelt thanks to all student and faculties from Electronics and Computer department, those who have contributed to make this effort in a successful one.

We profusely thank our Hon. Executive Director Shri. Anil Bagane, Principal Dr. S. A. Khot and head of Electronics and Computer engineering department Dr.P.S.Patil for giving support and encouragement and a free hand in this Endeavour.

Ms. P.D Ghate
Assistant Professor
E & C Engineering Department

VISION

"To be a centre of excellence in Electronics & Computer engineering education to prepare professionally competent engineers with lifelong learning attitude for the accomplishment of ever-growing needs of society."

MISSION

To prepare technically and professionally competent engineers by imparting quality education through effective teaching learning methodologies and providing stimulating environment for research and innovation.

To develop professional skills and right attitude in students that will help them to succeed and progress in their personal and professional carrier.

To imbibe moral and ethical values in students with concern to society and environment.

PROGRAM EDUCATIONAL OBJECTIVES

Graduates will

1. Acquire fundamental knowledge of Electronics and Computer Engineering to design and develop new ideas to solve real time problems.

2. Excel in professional carrier by applying recent technologies & skills in Electronics and Computer Engineering field.

3. Exhibit leadership qualities, effective communication skills & lifelong learning attitude to work efficiently with industry by promoting appropriate practices and sense of social responsibility.

PROGRAM SPECIFIC OUTCOMES

Students will be able to

1. Demonstrate proficiency in use of software and hardware required to develop solution in the field of Electronics and Computer Engineering.

2. Ability to design and develop analog, digital, embedded systems and computer algorithms using various learning platforms.

PROGRAM OUTCOMES

Engineering Graduates will be able to:

1. Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

2. Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

3. Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

4. Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

5. Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

6. The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

7. Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

8. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

9. Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

10. Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

11. Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

12. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

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1. ISRO's Upcoming Missions: A Glimpse into the Future

The Indian Space Research Organisation (ISRO) has a series of ambitious missions planned for 2024, demonstrating its commitment to advancing space technology and exploration. Here are some of the key upcoming missions:

1. **Gaganyaan 1:** This mission is part of India's human spaceflight program and is scheduled for January or February 2024. It will be an uncrewed test flight aimed at preparing for a future manned mission. The spacecraft will carry three crew members and test the systems required for human space travel (mint) (Hindustan Times).

2. **NISAR (NASA-ISRO Synthetic Aperture Radar):** This collaborative mission with NASA aims to launch a dual-band radar imaging satellite. The satellite will provide critical data for Earth observation, including monitoring ecosystems, natural hazards, and changes in the cryosphere (India Today) (Hindustan Times).

3. **Mangalyaan-2 (Mars Orbiter Mission 2):** Following the success of the first Mars mission, Mangalyaan-2 is set to explore Mars' surface, atmosphere, and climate with advanced scientific instruments. This mission will further enhance our understanding of the Red Planet (mint) (Hindustan Times).

4. **Shukrayaan-1 (Venus Orbiter Mission):** Scheduled for December 2024 or early 2025, this mission will be India's first to Venus. It aims to study the Venusian atmosphere and surface, contributing valuable data about our neighboring planet (mint) (Hindustan Times).

5. **INSAT-3DS:** Part of the Indian National Satellite System, INSAT-3DS will be launched in January 2024 to improve weather forecasting, disaster management, and meteorological services (India Today) (Hindustan Times).

6. **X-ray Polarimeter Satellite:** This mission, set for launch in the first half of 2024, will study the polarization of cosmic X-rays, providing insights into celestial phenomena like pulsars, black holes, and supernova remnants (India Today) (Hindustan Times).

These missions illustrate ISRO's comprehensive approach to space exploration, focusing on both scientific discovery and practical applications. The agency's continued collaboration with international partners and emphasis on innovation positions India as a significant player in global space research.

Ms P D Ghate

Assistant Professor

Dept of ECE

2. "Revolutionizing Medication Management: The Technology and Benefits of Smart Medicine Dispensers"

Smart medicine dispensers are devices designed to help individuals manage their medication more efficiently and accurately. These devices are equipped with sensors and other technological features that allow them to track medication schedules, dispense the correct amount of medication, and provide reminders to patients or caregivers. In this article, we will explore the technology behind smart medicine dispensers, their benefits, and their potential impact on the healthcare industry.

Smart medicine dispensers use a combination of hardware and software components to function. The hardware includes the dispenser unit itself, which typically consists of a container for medication, a dispensing mechanism, and sensors to detect when medication is dispensed. Some dispensers also have biometric authentication features, such as fingerprint or facial recognition, to ensure that only authorized individuals can access the medication. The software component of smart medicine dispensers includes the user interface and the algorithm that controls the dispensing of medication. The user interface is typically a smartphone app or a web-based interface that allows the user to input their medication schedule and receive alerts and reminders when medication is due. The algorithm that controls the dispensing of medication is designed to ensure that the correct amount of medication is dispensed at the appropriate time.

Smart medicine dispensers are an innovative solution to medication management that can benefit both patients and caregivers. By reducing medication errors, improving medication adherence, and providing peace of mind to caregivers, these devices have the potential to make a significant impact on the healthcare industry. As the technology continues to evolve, we can expect to see even more advanced features and capabilities that will further improve the safety and effectiveness of medication management.

Components

Atmega32 Microcontroller

IR Sensor

LCD Display

Bluetooth Module

RTC Module

Stepper Motor Driver

Stepper motor

Servo motor

Ms Gayatri Jagtap

B.Tech ECE

3. A Journey of Dedication & Mentorship

I am elated to announce that I have clinched the coveted FIRST PRIZEs in the esteemed Event Dipex 2023, Expotech Vision 2k24 in Walchand college of Engineering,Sangli.,Also in Event at K K Wagh College. This achievement stands as a testament to the countless hours of hard work, dedication, and guidance that propelled me towards success.

My heart brims with gratitude as I extend my sincerest thanks to Hod Dr Pravinkumar Patil for affording me this incredible platform to showcase my skills and talents. Their unwavering support and encouragement have been the cornerstone of my triumph, empowering me to reach new heights.

A special note of appreciation goes out to Dr Sachin Gurav whose expert guidance has illuminated my path throughout this transformative journey. His unwavering mentorship has not only nurtured my technical prowess but has also sculpted my approach to software development, instilling in me a deep understanding of the intricacies involved.

Participating in this competition has been a tremendous honour, and the recognition I have received serves to further ignite the flames of my passion in project development. The experience has solidified my commitment to excellence in this field and motivated me to continue pushing boundaries.

As I reflect upon this journey, I am reminded of the power of mentorship, the importance of unyielding support, and the fulfilment that arises from pursuing one's passion with fervour. This victory marks not just an endpoint, but a milestone on a path of continuous growth and innovation.

I am excited about the possibilities that lie ahead and look forward to hannelling this achievement into even more remarkable contributions to the world of software development. With renewed determination and an indomitable spirit, I am ready to embark on new challenges and opportunities that await.

Thank you to everyone who has been a part of this journey, and here's to a future marked by innovation, collaboration, and unceasing growth!

Name of Project: "Mobility-Minds: Unleashing Potential With AI emowered Mobility Standers for Cerebral Palsy, Amyotrophic Lateral Sclerosis and paralysis patients."

Name of Students :

1. Suyash Vinay Pande
2. Mahesh C Avalakki
3. Ruturaj R Patil
4. Mohak P Sidgonda

Name of Event: Dipex 2023 in Mumbai

Name of Project: "Mobility-Minds: Unleashing Potential With AI emowered Mobility Standers for Cerebral Palsy, Amyotrophic Lateral Sclerosis and paralysis patients."

Name of Students :

5. Suyash Vinay Pande
6. Mahesh C Avalakki
7. Ruturaj R Patil
8. Mohak P Sidgonda

Name of Event: Expotech Vision 2k24 Walchand College of Engineering Sangli.

Name of Project: "Mobility-Minds: Unleashing Potential With AI emowered Mobility Standers for Cerebral Palsy, Amyotrophic Lateral Sclerosis and paralysis patients."

Name of Students :

9. Suyash Vinay Pande
10. Mahesh C Avalakki
11. Ruturaj R Patil
12. Mohak P Sidgonda

Name of Event: Project Competition at K K Wagh College, Nashik

4. AZADI KA AMRIT MAHOTSAV: 75 YEARS OF INDIAN INDEPENDENCE

India is celebrated its 75th anniversary of independence this year, and the government has launched a year-long event called Azadi Ka Amrit Mahotsav to commemorate the occasion. The Mahotsav (festival) is a celebration of India's progress in the areas of education, health, technology, and other sectors.

Education

One of the most significant areas of progress in India has been in education. The literacy rate has increased from 18% at the time of independence to 77% today. The number of schools has also increased dramatically, and there is now a greater focus on quality education. The government has also launched several initiatives to improve access to education for girls and marginalized communities.

Health

India has also made significant progress in the area of health. The life expectancy has increased from 32 years at the time of independence to 72 years today. The infant mortality rate has also declined significantly. The government has launched several initiatives to improve health care, such as the National Health Mission and the Ayushman Bharat Pradhan Mantri Jan Arogya Yojana (PM-JAY).

Technology

India has also made rapid progress in the area of technology. The country is now a global leader in information technology and the software industry. The government has also launched several initiatives to promote the use of technology in other sectors, such as agriculture, education, and health care.

Azadi Ka Amrit Mahotsav is a time to celebrate India's achievements and to look forward to the future. The government has set ambitious goals for the next 25 years, and the Mahotsav is a chance to recommit to these goals and to work together to make India a better place for all.

Azadi Ka Amrit Mahotsav is a time to celebrate India's past, present, and future. It is a time to remember the sacrifices of the freedom fighters, to appreciate the progress that has been made, and to look forward to the bright future that lies ahead.

Sports

India has a rich history of sports, and the country has produced some of the world's greatest athletes in a variety of sports, including cricket, hockey, badminton, and wrestling. In recent years, India has also made significant progress in other sports, such as shooting, gymnastics, and table tennis. At the 2020 Tokyo Olympics, India won a record seven medals, including two gold medals that included Neeraj Chopra's gold in Javelin Throw. This was a major achievement for the country, and it showed that India is a force to be reckoned with in international sports.

5. Embarking On a Journey of Discovery: My Research Internship Experience at Griffyn Robotech Pune.

Mission: Critical Products for the Defence Industry

My research internship at Griffyn Robotech Pune. has been nothing short of extraordinary, filled with learning, innovation, and the thrill of witnessing the success for Defence.

The internship journey has been nothing short of transformative. From collaborating with experienced researchers on challenging projects to engaging in brainstorming sessions that

redefine the boundaries of innovation, every moment at Griffyn Robotech Pune. has been a step towards personal and professional growth.

In the words of Dr. A.P.J. Abdul Kalam, "Dream, dream, dream. Dreams transform into thoughts and thoughts result in action." My time at Griffyn Robotech Pune. has not only allowed me to dream but also equipped me with the tools to turn those dreams into reality.

Mr Varun Gurav

B.Tech in Electronics and Computer Engineering

6. THE JOURNEY OF A THOUSAND MILES. BEGINS WITH A SINGLE STEP"

My first Mumbai travel happened because of participation of this Expo a Reaching to the Expo and networking with multidisciplinary people of pan India really helped me in growing me. In Expo I have a great experience because it is said some beginnings are always special to remember.

Received Special award in Indian Automation Challenge Expo held in Mumbai for project titled as Smart and Hybrid E control Aquaponics System for Agriculture Field

7.What next for ISRO after Chandrayaan 3? Five upcoming Indian space missions in 2024

Indian Space Research Organisation (ISRO) rocket carrying the Chandrayaan-3 spacecraft (File photo)(ISRO)

The Indian Space Research Organisation (ISRO) successfully launched Chandrayaan 3 mission that landed on the moon's south pole on August 23, with the development of Chandrayaan 4 already in the talks of the space agency.

After Chandrayaan 3 mission's rousing success and the launch of India's first solar observation mission Aditya L1, ISRO is gearing up to launch a series of space exploration missions to take the country's knowledge about the outer space to another level.

List of upcoming ISRO space missions

INSAT 3DS

The INSAT 3DS is a part of the Indian National Satellite System (INSAT) series developed by ISRO. The mission will tentatively be launched in January 2024. The aim of the satellite is the monitor and gain more knowledge about weather system, disaster management and important meteorological forecasts.

Gaganyaan 1

Gaganyaan's maiden mission is jointly prepared by ISRO and Hindustan Aeronautics Ltd (HAL), set to take off in January or February 2024. Gaganyaan 1 will be a test flight to prepare for India's manned space mission, set to carry three crew members.

NISAR

NASA-ISRO Synthetic Aperture Radar (NISAR) is a joint project between NASA and ISRO, where the two space agencies have partnered to launch a sythetic aperture radar satellite. It will be launched in the January 2024, and will be the first dual band radar imaging satellite.

X-ray Polarimeter Satellite

The X-ray Polarimeter Satellite will be launched into the orbit in the first few months of 2024 to study the polarisation of cosmic x-rays, and will stay put for at least 5 years. It will be used to observe pulsars, black hole x ray binaries, active galactic nuclei, and non-thermal supernova remnants.

Venus Orbiter Mission

In the Venus Orbiter Mission, ISRO plans to launch a spacecraft to orbit the planet Venus for the first time in the history of the country. The spacecraft will orbit Venus for five years to study the atmosphere of the planet, and will be launched in 2025.

8.New technologies being developed for Gaganyaan

Human safety is of paramount importance in Gaganyaan mission. In order to ensure the same, various new technologies comprising of Engineering systems and Human centric systems are being developed and realised.

Crew training for Gaganyaan

Astronaut Training Facility established in Bengaluru caters to Classroom training, Physical Fitness training, Simulator training and Flight suit training. Training modules cover academic courses, Gaganyaan Flight Systems, Micro-gravity familiarization through Parabolic Flights, Aero-medical training, Recovery & Survival training, mastering of Flight Procedures and training on Crew Training Simulators. Aero medical training, Periodical flying practice and Yoga are also included as part of the training.
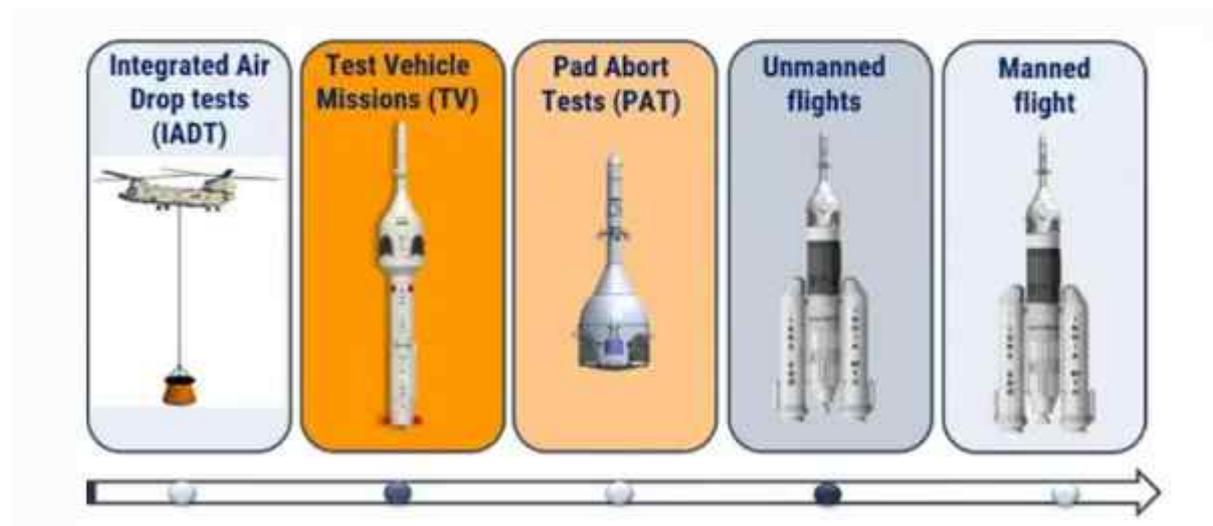

Astronaut Training Facility

Milestones achieved so far

Test vehicle for characterisation of Crew Escape System ready at SDSC


Major milestones planned

9.THE LIBERATING POWER OF REFRAMING YOUR PERSPECTIVE

In every stage of life, we are presented with choices that determine how we are emotionally affected by events. It is not the events themselves that wield this influence; rather, it is our responses to these events that hold sway over our emotional well-being.

Re framing, in essence, is the art of actively selecting our responses. It calls for a deliberate decision to steer clear of regret and resentment, recognizing that regardless of the circumstances, we always possess the agency to choose our path. The pivotal question is whether we are in control of our own destinies, making choices that best serve us, or whether we are driven by external influences, overly reliant on the opinions and responses of others.

Our chosen responses define the impact an event has on us and shape our thoughts and feelings. Therefore, it is not the event itself or the actions of others that determine our emotional state; rather, it is our response to these factors that either grants us inner peace or subjects us to distress.
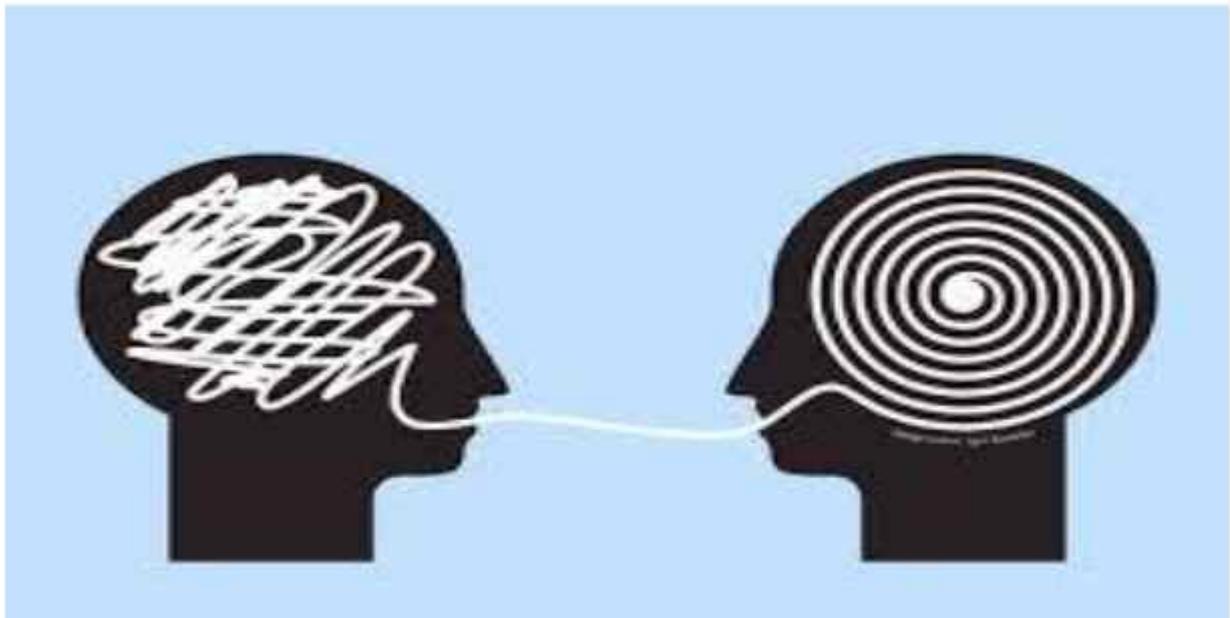
In the practice of re framing, we actively decide what meaning an event holds for us. Even in the face of adversity, we search for silver linings, focusing on the positive aspects of a situation. Instead of becoming victims of circumstance, we proactively seek ways to harness the situation to our advantage.

One can re frame a negative context with a positive perspective, uncovering the potential for personal growth, newfound strength, and resilience that can arise from challenging experiences. In doing so, we shift our focus away from denying reality and instead fully acknowledge it. We make a conscious choice regarding how we will respond to this reality, opting to either succumb to anger, self-pity, and upset or to channel our energies into exploring the advantages within the situation and actively seeking ways to derive personal benefit from it.

The method of re framing may vary, but the desired outcome remains constant: transitioning from a blame-oriented mindset to one centered on embracing positive outcomes and happiness.

Re framing is not new. Many fables and fairy tales include behaviour that change their meaning when the frame changes. Consider, for instance, the tale of the ugly uckling who, for the longest time, compared itself unfavorably to its fellow ducks. Ultimately, the realization of its true identity as a beautiful swan showcases the trans formative power of re framing.

Re framing is inherently linked to creativity, as it involves taking ordinary events or objects and placing them in a new, useful, or enjoyable frame of reference. It is, without a doubt, a liberating way of thinking, empowering us to transcend limitations, find opportunities amidst challenges, and ultimately lead more fulfilling lives.

Ms P D Ghate
Assistant Professor
Dept of ECE

10.The Power of Soft Skills: Our Favorite Reads

When you look up "soft" in the dictionary, you'll find descriptors like agreeable, quiet, subdued, easy, impressionable, and weak. None of these adjectives do justice to the competencies mentioned above. When we define more technical, quantifiable skills as "hard," it almost seems like we are assigning more value to our output at work and less to our characters.

There are consequences to this. In my experience, it can discourage people from focusing on building a healthy relationship with themselves and others. I've felt this throughout my education and early career. My instinct to prioritize people over production has often seemed incorrect. While there, of course, needs to be a balance between the personal and the professional, I feel an unhealthy pressure to constantly do more, produce more, and get ahead if I want to succeed.

During a time when some of our most pressing problems can only be solved through a mutual desire to understand one another, I believe labeling skills this way is a mistake. Without empathy, leadership, and good communication, we can't possibly begin to build a more equitable workforce. In a world that is changing faster than we can imagine, why don't we prioritize open-mindedness and adaptability?

As we accentuate the need to lead with compassion, and for the next generation to make work an inclusive space, it's important we recognize that the skills we call "soft" are the skills we need the most.

Mr T M Diwakar
Assistant Professor
Department of ECE