



GCEK

HERALD

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Team HERALD

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EDITOR'S NOTE:

Season Greetings!

I am happy to present the first issue of GCEK HERALD, for the academic year 2016-17. I thank everyone who has contributed to this newsletter as these contributions are of great significance to the success of this newsletter.

In the current issue, apart from institutional reports, the newsletter highlights the theme INNOVATION. In series we are planning for next issue on smart campus and subsequent issue on start-ups. I welcome ideas so that our campus could be a smart and digital campus. As a team, we aim to balance knowledge and news regarding college activities and encourage all the students to contribute for the same. I hope you enjoy reading this issue!

-Dr. R.B. Kulkarni



ALL POSTGRADUATE PROGRAMS OF GCE, KARAD ACCREDITED

The National Board of Accreditation (NBA) team visited our institute on 16th, 17th and 18th September 2016, for accreditation of postgraduate courses. The national board of accreditation is a sole accreditation body for technical education in India which provides accreditation to technical institutes for various programs. The institute had applied for programs in Heat power engineering, production engineering, construction management, structural engineering and power systems.. The accreditation body constituted of em-



inent educationists from top institutions of the country and the team was led by Dr. P.K. Bose with members Prof. Umar, Dr. Ranganath, Prof. Subudhi, Prof. Tiwari and Prof. Pandey. The team rigorously checked all the parameters required for the accreditation purpose. Dr. P.M. Khodke, HODs, deans, faculty and staff took a lot of effort to comply with the NBA accreditation process. The institute received communication that all PG programs are accredited. The UG programs in Civil, Mechanical, Electrical and Information Technology were January 2016 while MCA program was accredited in September 2016. Thus 10 out of 11 programs of the institute are accredited by NBA.

NATIONAL CONFERENCE AT GCE, KARAD ON EMERGING TRENDS IN INFORMATION TECHNOLOGY

Department of Information Technology in GCE, Karad proudly hosted a national conference on EMERGING TRENDS IN IT (NCRTIT, 2016) on 1st and 2nd October, 2016. The main objective of the Conference was to provide a platform for researchers, engineers, academicians as well as industrial professionals from all over the world to present their research results and development activities in Information Technology. The paper presentation took place in 4 slots in the conference, and out of 100 research papers submitted, best 33 were selected and presented. The conference was attended by several eminent researchers and rep-

resentatives from industry. Two prominent speakers Mr. Anant Padmanabhan, Vice President of T-Systems, Pune and Dr. Aarti



Dixit, executive council member of ACM-W India. The keynote speech by Mr. Anant Padmanabhan

highlighted the topic Internet of Things & Dr. Aarti Dixit presented a speech on cloud computing. The conference was successful under the guidance of Principal Dr. P.M. Khodke, Dr. S.J. Wagh and organizing secretary Ms. Mule.



- SMART CAMPUS
- START-UPS

PRINCIPAL'S NOTE

I am happy to present the first issue of GCEK-Herald with a contemporary theme of INNOVATION. I congratulate all the students for their efforts in bringing this unique issue. Innovate and survive otherwise perish is the new worldwide mantra of this decade. Innovation means breaking the conventional molds and embracing the dominant ways of thinking, introducing new things, behaviors, and launching new standards. In simple words innovation is doing things in a new and different manner to improve the present condition from good to best and beyond. Innovation can be in broader sense classified as a product innovation, process innovation, and behavioral innovation.

There is perhaps no better metric to capture a country's innovation index than the number of filed patents. Patents filing are a barometer for assessing the spread of scientific progress and innovation and invention in the knowledge based economy. The number of patents filed by different countries indicates the technology gaps between them. The number of patents fillings by China in 2013 alone (7,04,936) is more than the fillings by India during 1962 to 2013 (1,29,529). In 2014, India filed 1,428 international patent applications as against 57,385 by US, 42,381 by Japan, 25,548 by China and 13,117 by South Korea. The statistics also indicate the innovation gaps even among developing countries of Asia. Last year innovators filed some 25.7 Lacs patents worldwide which includes maximum 7.5% in computer technology followed by electrical machinery (7.2%), digital communication (4.5%) and medical technology (4.3%).

Hon. Prime Minister Shri. Narendra Modi thinks that genetic science existed in ancient India. However, above statistics do not support the claim. India is widely considered an innovation hub a better centre of innovation than even US and China. Due to largest democracy in the world and demographic advantage, there is there is good amount of scope for presenting creativity. Being technology students, we should remember that large onus lies on us. Let us utilize our talent and creativity and make largest economy in the world by increasing innovations.

GCEK- Herald has planned next issues on smart campus which is very relevant to the growth of our institute. I would appeal to all students to contribute with full vigor, enthusiasm and expectation. I assure that the ideas would be definitely considered for further development of campus.

I wish you happy and prosperous and Happy Diwali.



Dr. P.M. Khodke
(M.Tech., Ph.D., MBA)

Prof. (Dr.) P. M. Khodke
Principal

TRAIN THE TRAINERS PROGRAM BY DTE, NASSCOM AND GCEK

The program was a series of workshops conducted by NASSCOM and DTE to train teachers. The theme of the program was to impart foundation skills in IT. This is a first-of-a-kind initiative with the



collaboration of industry, DTE and NASSCOM which was attended by faculties of Computer Sciences and Information Technology from different colleges from all over Maharashtra.

ADVANCED PEDAGOGY: TEACHERS' TRAINING PROGRAM



A session on 'Advanced Pedagogy' was conducted from 13th -16th October 2016. It was conducted under TEQIP-FSD, by Dr. R.N. Mathur, President, EQUATE (Effective Quality

Upgradation Assistance for Technical Education), New Delhi. Dr. Mathur delivered a speech on Blooms Taxonomy. Mr. Yash Chawla (Intrapreneur, Public Speaker,

Motivator), conducted a session on 'USE OF SOCIAL MEDIA FOR TEACHING'. The main focus of the session was on the use of Facebook, making presentation on Prezi, and use of Canvas software. The session was attended by 41 professors from all the departments of GCEK and it indeed proved to be fruitful.





**Name: Mr. Pandurang Ramchandra Shinde, alumnus of 1973 batch
Director, Cyclo Transmissions Private Limited, Satara
Winner of Entrepreneurship Award in 1983. Recipient of Best Productivity
Award in 1985, 1986, and 1987**

- **Hello Sir, it is good to have you as an alumnus of GCE, Karad. What is your feeling about GCE, Karad?**

I have spent the best time of my life in my college. I have enjoyed a lot in GCE and it is my inspiration for a successful life.

- **What is the motivation to start your venture, which has now turned into a huge power equipment company?**

The decision of pursuing polytechnic was the turning point of my life. I failed the 10th class, but I completed my graduation with 71% aggregate. This proved to be a great lesson for me and it ignited a fire within me to start my business. My struggle during college days exposed me to various problems and their solutions. During my graduation, I realised that there were many opportunities of business in India and I developed a passion for the same.

- **What strategies did you have, when there was competition in India and abroad, for your business?**

When I started the company, I looked for the products which were not available in the Indian market or the products which were required to be imported but could be produced here. I noticed that market was not a big problem but technology was. Ways to produce imported

products locally was my initial plan.

- **What makes your products different and better than other similar products available in the market?**

We design gearboxes keeping in mind their lubrication and cooling requirements, complete static and dynamic load analysis, evaluation of materials and heat treatment and try to implement the latest manufacturing technologies to achieve an efficient batch of products.

- **What message would you like to convey to upcoming entrepreneurs?**

Well, what I'd tell them is, composed patience is one of the most important things required when starting a business. You cannot expect immediate results. You need to have a proper concept based strategy, wherein you consider all the important factors that may affect your business in some or the other way. Two most important factors are a stable capital and an innovative and practical concept. So, I would urge the students to think about all the various possibilities and be as innovative as possible.

- **What is your suggestion to the emerging start-up culture in the country and how should GCE, Karad adopt?**

Now there is immense potential for start-ups. GCE, Karad should start an incubation centre and take help from alumni like us to promote entrepreneurship in the campus.

Interviewed by
-Kalyani Kesarkar, Harshada Mokashi,
Pranav Kulkarni, Tohid Mujawar (S.Y. Mech)

Mr. Vikas Bansal Founder and Managing Director, Fermion InfoTech.

Mr. Vikas Bansal, is our MCA, year 2000 alumnus. He is the founder of Fermion InfoTech, which has come a long way since the inception of eBay and Amazon. Currently several new online businesses are emerging every single day. While there are businesses that proffer multitude of goods and services on their platform, there also are online companies that offer the niche. Realizing the market niche in e-Commerce solution, Fermion InfoTech kick-started its operation in November 2010. Having witnessed the market transition from 2000-2016, the ins and outs of the e-Commerce sector are known. Taking the unusual route, Fermion InfoTech first grabbed few projects and then incepted the company to have a regular flow of capital for the firm. Proffering comprehensive e-Commerce website development solutions constantly resulted in steady establishment of the company which never dried up since then and has over 100 customers in its kitty now.

The entity has been designing, custom developing, testing and deploying a full-fledged e-Commerce site in the client's server. Covering the mobile app



development in Android and iOS platform, this team proffers the extended services of data and site optimization, consulting services and infrastructure & hosting. Indulged in data migration services, the high end services of Fermion assimilate the e-Commerce platform with legacy ERP and third party system. Growing steadily year-over-year, Fermion is all set to enter the digital market arena to proffer regional marketing services through its highly skilled team of 35 personnel who joins the company as a fresher and gets moulded through extensive training.

INDIA, INNOVATIVE?

The holistic approach to innovation was particularly relevant to India, although some people had a global perspective in mind. India was poor in intellectual property development. It generated few doctorates in science and fewer in engineering. Its R&D investments were low. But the country was still innovating in business models and select areas of technology. Innovation of a unique variety was thriving in its villages. People started developing an index that could capture innovative capability in broad terms. Ten years later, the Global Innovation Index (GII) has become an annual feature, and examined carefully by policy-makers around the world. Recent results show that India is improving fitfully, with pockets of excellence. It also shows that China is in the big league, and that India is wasting a lot of its capabilities. A few numbers first, along with a few caveats. In 2008-09, India was ranked 41 and China 37. India gradually slipped every year, reaching a low of 81 last year. China improved gradually, and broke into the top 25 this year. India's position improved to 66 this year, which was where it was four years ago. The GII index authors always warn against reading too much into individual rankings, and to

In A Perfect World Of Innovation, Who Would Do What?

Top ranking countries/economies for selected indicators from the Global Innovation Index 2016

HUMAN CAPITAL AND RESEARCH

EDUCATION EXPENDITURE PER PUPIL
MOZAMBIQUE
PERFORMANCE OF PUPILS IN READING, MATH AND SCIENCE
CHINA
PUPIL-TEACHER RATIO
GEORGIA
GRADUATES IN SCIENCE AND ENGINEERING
IRAN
R&D EXPENDITURE AS SHARE OF GDP
REPUBLIC OF KOREA
QUALITY OF UNIVERSITIES
UNITED KINGDOM

CREATIVE OUTPUTS

TRADEMARK APPLICATIONS
PARAGUAY
INDUSTRIAL DESIGN APPLICATIONS
TURKEY
ICTS AND ORGANISATIONAL INNOVATION
ESTONIA
CREATIVE INDUSTRY EXPORTS
COSTA RICA
PUBLISHING INDUSTRY
LEBANON

INSTITUTIONS

REGULATORY QUALITY
HONG KONG (CHINA)
EASE OF STARTING A BUSINESS
NEW ZEALAND

BUSINESS SOPHISTICATION

KNOWLEDGE-INTENSIVE EMPLOYMENT
SINGAPORE
WOMEN WITH ADVANCED DEGREES
RUSSIAN FEDERATION
UNIVERSITY AND INDUSTRY RESEARCH COLLABORATION
USA
STATE OF CLUSTER DEVELOPMENT
UAE

INFRASTRUCTURE

USE OF INFORMATION TECHNOLOGIES
DENMARK
CAPITAL & INFRASTRUCTURE INVESTMENT
ALGERIA
ENVIRONMENTAL PERFORMANCE
FINLAND

KNOWLEDGE AND TECHNOLOGY OUTPUTS

PCT INTERNATIONAL PATENT APPLICATIONS
JAPAN
QUALITY OF SCIENTIFIC PUBLICATIONS
GERMANY
PRODUCTIVITY GROWTH
INDONESIA
HIGH- AND MEDIUM-TECH MANUFACTURING
SWITZERLAND
HIGH-TECH EXPORTS
MALAYSIA
ICT SERVICES EXPORTS
INDIA

MARKET SOPHISTICATION

EASE OF GETTING CREDIT
RWANDA
MICROFINANCE AS SHARE OF GDP
CAMBODIA
VENTURE CAPITAL DEALS
ISRAEL

India VS China

	2016	2015	2014	2013
India	66	81	76	66
China	25	29	29	35

focus on the trends. The trends show one thing unambiguously — India is on a roller-coaster ride while China is constantly improving. GII parameters and methodologies are being tweaked continuously, and the changes in ranking are as much due to new parameters and data as they are due to changes within a country. And yet the truly innovative nations remain steady in their rankings. Switzerland has been ranked one for six successive years. India is among the few big countries with fluctuating positions, which indicates the rapid changes the country is going through. In spite of the low ranking, this year's GII report marks India as an innovation

overachiever, a small number of countries that perform at least 10% better than their peers based on GDP. The last decade, and has helped bag higher rankings. A deeper look at the education rankings show that the improvements are partly in perceptions, as the QS University Ranking system uses opinion of peers as a key input. As

the government invested more on education through new institutions and improved research funding Indian educational institutions improved in the eyes of their global peers. With over 1,000 multinational R&D centers, India is a global R&D powerhouse. Precise figures are not disclosed by companies, but senior bureaucrats estimate their spending to be roughly at same level of that of the union government. These R&D centers raise the level of technical knowledge and skill in the country, but have no direct and significant impact on the economy. In spite of such a large base, India's global ranking is 20. Weaknesses are also significant. Low political stability is one, especially when combined with terrorism impact. Poor education system is a weakness in spite of recent improvements. Indian innovation is also hampered by poor environment performance, low density of startups, and low publishing output.

-Hari Pulakkat, The Economic Times

CAPITAL GATE



Capital Gate is a skyscraper in Abu Dhabi designed with a striking lean. The building's form is meant to represent a swirling spiral of sand, while the curved canopy, which runs over the adjoining grandstand and rises on one side of the building shielding it as

much as possible from direct sunlight. The vertical and horizontal cross-sections of the tower are all unique. The upper half of the tower has a double skin facade to reduce the solar heat gain at the hotel levels. Here it creates an insulating buffer between the hot outside air and the cool inside air. The air is re-used in the room rather than exhausted and replaced with outside air.

Source- Wikipedia
-Suraj Shinde(S.E. CIVIL)

DHOLA-SADIA BRIDGE



One of the most remote place in India is Sadiya in Assam. The most important bridge, between Dholasadia in Assam, is slated for commissioning later this year. This 9.15 kilometre long bridge will drastically

and significantly improve road connectivity to the border state of Arunachal Pradesh. The most crucial factor of this connectivity will be to bring Line of Actual Control (LAC) closer and accessible to the mainland. . Once the bridge is commissioned, it will take 30 minutes to cross over to Sadiya, which is near the Lohit border. The travel time will be cut by up to four hours. From there, it will take only a few hours to reach the LAC.

Source- Wikipedia
-Parikshit Ghodake(S.E. CIVIL)

AUTOMATED BILLING SYSTEM USING RFID READERS:

The project is using RFID tags for automated billing in shopping malls. The idea is to reduce the time by using RFID technology to bill the goods bought in a shopping mall. RFID reader will be a smart reader that will not only read the tags but will also perform many more operations on the data received. When shopping, if the shopping bag contains all items that are to be purchased, the bag will be required to be placed on the platform in front of the RFID reader. The reader will read the tags on every item in the bag. As the RFID reader does not require line of sight access to read the tags and it can read multiple tags at almost the same time, the reading operation of all tags in the bag is expected to complete within a few milliseconds. An RFID system consists of an RFID tag made up



of a microchip with an antenna, and a reader with an antenna. The reader sends out electromagnetic waves. The tag antenna is tuned to receive these waves. A passive RFID tag draws power from the field created by the reader and uses it to power the microchip circuit. The chip then modulates the waves which the tag sends back to the reader, which converts the new waves into digital data.

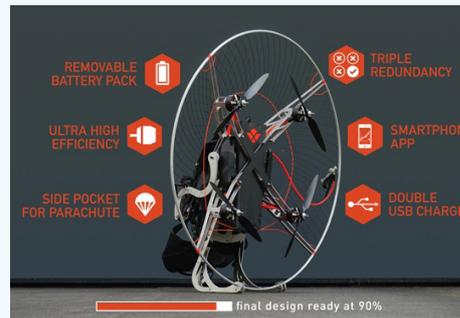
-Vedant Chougule (B.E.I.T.)

TOP REASONS WHY WE NEED INNOVATION

- For economic growth
- For the progression of human well-being
- For competitive advantage
- Because cost cutting is not enough anymore
- Desire for higher business revenues
- To take advantage of opportunity
- For business survival
- Updation of existing ideas

REVOLT: PERSONAL FLIGHT SYSTEM

Revolt resembles a quad-copter with all four propellers mounted vertically, and a harness to strap on the user's back. The harness includes the battery pack and a parachute. The system is very similar to a standard paraglide, with batteries replacing gas powered motors and the quad-copter system in place of a giant fan. The goals when developing REVOLT were ease of use, safety, accessibility, efficiency and eco-friendly operation. Claims have been made that the propellers spinning in different directions will lessen the torque effects experienced during normal paragliding and give the user better precision when flying. A smartphone application also gives the user information about batteries and propellers. Up to 90 kilograms of thrust can be generated from the current prototype, and the system was designed to be transported in any sized vehicle. According to the cam-



aign page using 64 Ampere hour batteries will require 70 minutes of charging time and give a user 40 minutes of flight time. The batteries

have a theoretical life of 1000 cycles and cost around €880. Smaller battery increments are also available. Several other systems online show electric paragliding systems, but none seem to use quad-copter propellers the way that REVOLT does.

Source: www.engineering.com
-Snehal Suryawanshi (S.Y. I.T.)

INNOVATIVE CREATIVITY

Creativity is about generating ideas. Innovation is the implementation of the new. Innovation means taking creative ideas and making them real, implementing them. Innovation is not just releasing new products, it also encompasses implementing new business processes, radical alliances and business strategies. Creativity must be viewed as a means to an end and not an end in itself. The end is innovation— the realization of an idea.

To change:	To alter, make difference, move from one state to another.
Creativity:	The state or quality of being creative. The ability to create.
Innovation:	The act of introducing something new that is introduced as a novelty.
Lateral thinking:	Thinking which seeks new perspectives of looking at a problem rather than proceeding by logical steps.

DETECTING EMOTIONS WITH WIRELESS SIGNALS

gence Laboratory (CSAIL) of Massachusetts Institute of Technology (MIT) have developed "EQ-Radio," a device that can detect a person's emotions using wireless signals. MIT professor and project lead Dina Katabi envisions the system being used in entertainment, consumer behavior, and health care. EQ-Radio builds on continued efforts to use wireless technology for measuring human behaviors such as breathing and falling. Incorporation of emotion-detection makes a device that is aimed at detecting and predicting falls among the elderly. Using wireless signals reflected off people's bodies, the device measures heartbeats as accurately as an ECG monitor, with a margin of error of approximately 0.3 percent. It then studies the waveforms within each heartbeat to match a person's behavior to how they previously acted in one of the four emotion-states. EQ-Radio instead sends wireless signals that reflect off

traction algorithms break the reflections into individual heartbeats and analyze the small variations in heartbeat intervals to determine their levels of arousal and positive affect. These measurements allow EQ-Radio to detect emotion. For example, a person whose signals correlate to low arousal and negative affect is more likely to be tagged as sad, while someone whose signals correlate to high arousal and positive affect would likely be tagged as excited. The exact correlations vary from person to person, but are consistent enough that EQ-Radio could detect emotions with 70 percent accuracy even when it hadn't previously measured the target person's heartbeat. Although the focus on emotion-detection meant analyzing the time between heartbeats, the team says that the algorithm's ability to capture the heartbeat's entire waveform means that in the future it could be used for non-invasive health monitoring and diagnostic settings.

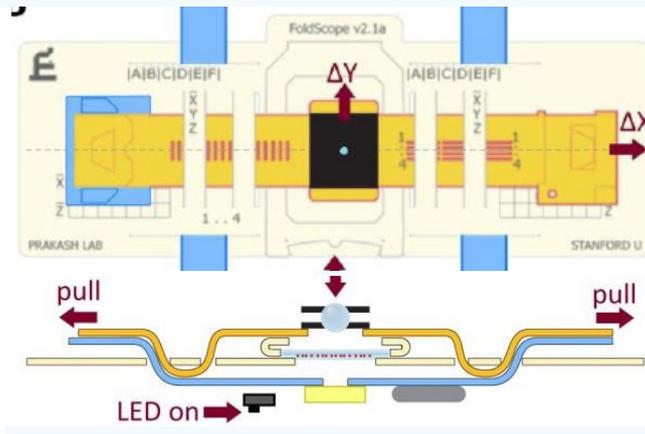
Source: CSAIL, MIT
-Tanveer Gupte (S.Y. E&TC)

FOLDSCOPE: ORIGAMI BASED PAPER MICROSCOPE

Mr. Manu Prakash, an Indian born scientist and professor of bio-engineering, is famous for this foldscope. Prof. Manu Prakash received the MacArthur fellowship in 2016. Born in Meerut, India and educated in Massachusetts Institute of Technology, Prof. Manu Prakash offered foldscope, an ultra-low-cost origami-based approach for large-scale manufacturing of microscopes,

aged instrument can survive harsh field conditions while providing a diversity of imaging capabilities, thus serving wide-ranging applications for cost-effective, portable microscopes in science and education. Cost-effective and scalable manufacturing is an integral part of “frugal science and engineering”. Manufacturing via folding has emerged

as a powerful and general-purpose design strategy with applications from nanoscale self-assembly to large-aperture space telescopes. More recently, possibilities of folding completely functional robots have been explored, with actuators, sensors and flexures integrated in a seamless fashion. Modern micro-lens fabrication technology is another prime example of scalable manufacturing. Modern techniques such as micro-scale plastic molding and centerless ball-grinding have grown to serve numerous applications, including telecommunication fiber couplers, cell phone cameras, and medical endoscopes. By combining principles of optical design with origami, a novel platform for the fabrication of flat microscopes cheaply in bulk can be presented. The Foldscope



specifically demonstrating bright field, dark field, and fluorescence microscopes. Merging principles of optical design with origami enables high-volume fabrication of microscopes from 2D media. Flexure mechanisms created via folding enables a flat compact design. Structural loops in folded paper provide kinematic constraints as a means for passive self-alignment. This light, rug-

is an origami-based optical microscope that can be assembled from a flat sheet of paper. Although it costs less than a dollar in parts, it can provide over 2,000X magnification with submicron resolution, weighs less than two nickel, is small enough to fit in a pocket, requires no external power, and can survive being dropped from a 3-story building or stepped

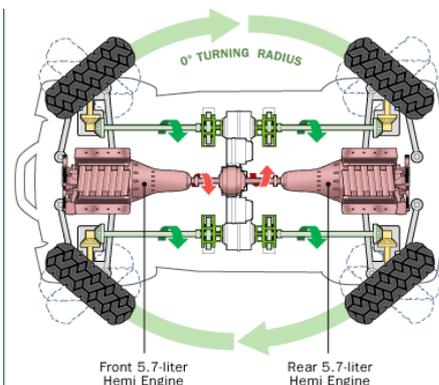
on by a person. Its minimalistic, scalable design is inherently application-specific instead of general-purpose, providing less functionality at dramatically reduced cost. Using this platform, we present our innovations for various imaging modalities (brightfield, darkfield, fluorescence and lens-array) and scalable manufacturing strategies. By removing cost barriers, Foldscope provides new opportunities for a vast user base in both science education and field work for science and medicine. A universal program providing “a microscope for every child” could foster deep interest in science at an early age.

- Original article by James Cybulski, Manu Prakash
- Edited by Krushna Tondare (S.E. E&TC)

ZERO TURNING RADIUS VEHICLE

This project aims for development of a system to reduce the turning radius of car. It works on the principle that when the two pairs of the wheels are coupled together using a tie bar and operated by a rack and pinion gearing, the rear pair of wheels turns in opposite direction and front side pair of the wheels in the same direction simultaneously causing the turning radius to be zero.

When we are operating the steering wheel, the pinion gear operates the rack along the cross direction that is to right and left causing the front wheel pair to turn to right or left at the same time due to the coupling tie rod, both the rear wheel pair will turn to linear side causing the vehicle to turn at its own place and the vehicle can rotate at its own place.



when there is very less space in between the two parked vehicle of the order of nearly equal to size of the vehicle.

-Sahyadri Birle (B.E. Mechanical)

FILTERING APPROACH FOR DETECTION OF LUNG NODULE BY USING X-RAY IMAGE

Lung cancer is a disease characterised by uncontrolled cell growth in the tissues of the lungs. It is a leading cause of death than any other type of cancer in the world. Its common cause is long term exposure to tobacco smoke. For detection of lung cancers at an early stage, Computed Tomography (CT) scanning is utilized. In about 85-95% of the undetected cases of lung cancer, the tumour is partly obscured by overlying bones such as ribs or clavicles. So Computer Aided Diagnostic (CAD) scheme for nodule detection on chest radiography has been investigated, as it improves accuracy in its detection. Chest radiographs (CXR) are commonly used for the detection of chest diseases as it costs less and is easily available. CAD scheme is based on single

exposure dual energy computed radiography, which is a technique for separating soft tissues from bones in CXRs by the use of two X-ray exposures at two different energy levels. The motive to develop CAD scheme is to improve sensitivity and specificity by use of "Virtual Dual Energy (VDE)" where ribs and clavicles are suppressed with Massive-Training Artificial Neural Networks (MTANNs). This technology suppresses ribs' and clavicles' opacities in CXRs while maintaining soft tissue opacity. Future scope is to try the methods with many pre-processing techniques, develop lung region segmentation algorithm to use with many data bases, develop algorithms to overcome rib shadows and apply these techniques to identify other cancers.

-Bobby Gajbhiye (B.E. I.T.)

CONVERTING FOOTSTEPS INTO ELECTRICITY

Flooring can be made from any number of sustainable materials, making it, generally, an eco-friendly feature in homes and businesses alike. Now, however, flooring could be even more "green," thanks to an inexpensive, simple method developed by University of Wisconsin-Madison materials engineers that allows them to convert footsteps into usable electricity. Xudong Wang, an associate professor of materials science and engineering, his graduate student Chunhua Yao and their collaborators published details of the advance in the journal Nano Energy. The method uses a common waste material: wood pulp. The pulp, already a common com-

ponent of flooring, is partly made of cellulose nanofibers. They're tiny fibers that, when chemically treated, produce an electrical charge when they come into contact with untreated nanofibers. When the nanofibers are embedded within flooring, they're able to produce electricity that can be harnessed to power lights or charge batteries. And because wood pulp is a cheap, abundant and renewable waste product of several industries, flooring that incorporates the new technology could be as affordable as conventional materials.

Source-www.engineering.com
-Saurabh Mane (S.E. CIVIL)

SOLAR ROOFTOP PANELS

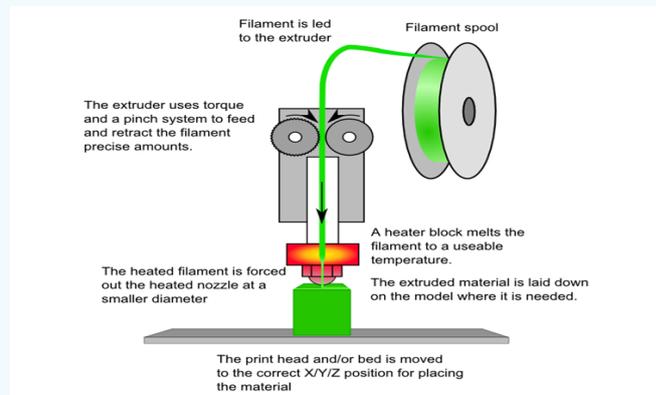
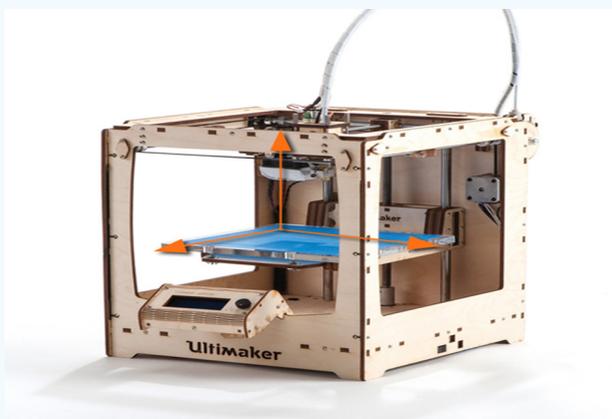
Instead of installing solar panels onto existing roof tiles, ZEP B.V., a company established in Netherlands manufactures ceramic roof tiles with integrated solar cells to make the original vision for the roof compatible with solar technology. The efficiency is advertised as 18.49 percent, which stacks up reasonably well compared to the standard black panel efficiency of around 20 percent. Regardless, the more the merrier, and's solar-integrated roof tiles offer an additional advantage: they're a space-efficient solution to rooftops constrained by obstacles like chimneys and skylights.



Source: zepbv.com
-Kalli Avinash Krishna(S.E I.T.)

3D PRINTING

3D printing is a form of additive manufacturing technology where a three dimensional object is created by laying down successive layers of material. Also known as rapid prototyping, it is a mechanized method whereby 3D objects are quickly made on a reasonably sized machine connected to a computer containing blueprint for the object. This revolutionary method for creating 3D models with the use of inkjet technology saves time and cost by eliminating the need to design, print and glue together separate model parts. Now you can create a complete model in a single process using 3D printing. The basic principles include materials cartridges, flexibility

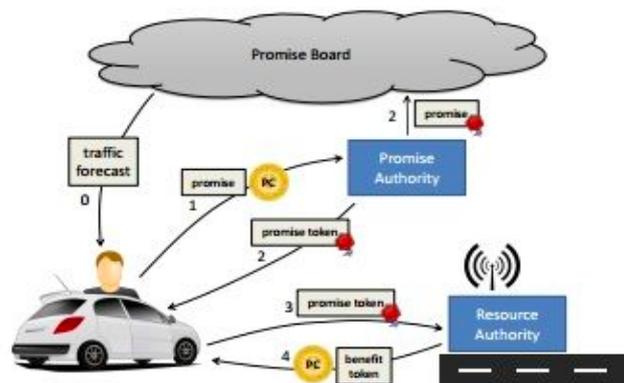


of output, and translation of code into a visible pattern. 3D printers are machines that produce physical 3D models from digital data by printing layer by layer. It can make physical models of objects either designed with a CAD program or scanned with a 3D Scanner. It is used in a variety of industries including jewelry, footwear, industrial design, architecture, engineering and construction, automotive, aerospace, dental and medical industries, education and consumer products.

-Mohit Thakur, Aniket Ghorpade, Shantanu Badadare, Prashant Dhepe, Sachin Tidke (T.E. Mech)

INTERNET OF VEHICLES

IoT is now a promising technology which spans every aspect of engineering field. Various projects are now the basis of IoT. Now we propose a small project based on a part of the above. The connected vehicle system changing the transportation system is called Internet of Vehicles (IoV). It is inter-operable network wireless communication among vehicles, infrastructure and personal communication devices. Using the information and communication technology, vehicles can communicate with vehicle, humans and infrastructure. This system can save time and money by guiding the driver, hence avoiding traffic jams and hazards. The system can also alert the driver in case when the vehicle requires maintenance. The system is capable of alerting the driver, or in required cases, controlling the speed of the vehicle. These systems also help in proper parking and autonomous parking systems. IoV also helps create systems which save fuel and energy by autonomously controlling all the sectors of a vehicle.



The main advantages of this system includes e-Licensing, vehicle security and maintenance of safety norms, rules and regulations. The systems also aims to develop in a manner where the driver no longer has to use cell phones when driving. IoV will also help the enforcing authorities to locate and track vehicles and also alert others in case of accidents by sending SoS signals.

-Vaibhav Dilip Solaskar (F.E., MCA)

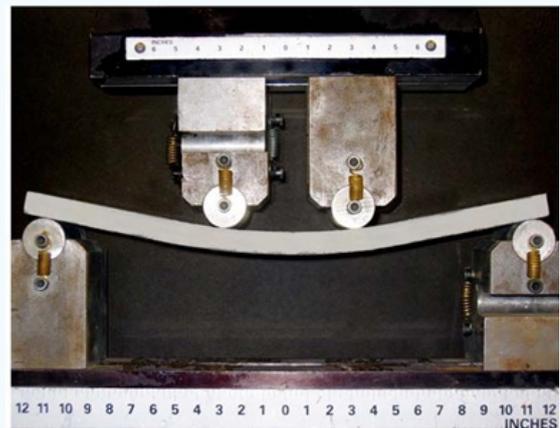
DUCTILE CONCRETE USING ENGINEERED CEMENTITIOUS COMPOSITES

(A research paper by Prof. U. L. Deshpande)

This research deals to improve conventional property of normal concrete. Ductile property of normal concrete can be improved by using PVA (polyvinyl alcohol) fibers in place of coarse aggregate and cement partially replaced by fly ash. For these purpose concrete cubes, cylinders, beams and slabs are experimentally investigated. The micro-crack pattern of this concrete shows the ductile behavior of bendable concrete. The aim of research work is to study ductile behavior of concrete, crack resistance capacity & concrete should give warning before its failure. Normal concrete is brittle in nature while ECC (engineered cementitious composites) is ductile in nature, due to this property; it has wide applications & wide future scope in various fields. In order to improve the behavior of concrete, fiber reinforced concrete (FRC) is made by adding discrete short fibers into the concrete matrix. Fibers which are currently used include steel, glass, carbon and polymer fibers. Development of FRCs started in the 1970s. By that time, only glass fiber and steel fiber were investigated. During the past 10 years, polyvinyl alcohol (PVA) fiber has been introduced in the production of FRC, resulting to a new composite, which exhibits a pseudo ductile behavior similar to that of steel and is called “engineered cementitious composites”.

The research resulted in formation of a moderately low fiber volume fraction (<2%) composite which showed extensive strain-hardening with strain capacity of about 3 to 5% compared to 0.01% of normal concrete. According to test results, the beam withstood high load and a large deformation without

succumbing to the brittle fracture typical of normal concrete, even without the use of steel reinforcement. On comparing ECC with conventional concrete it was noted that conventional concrete is brittle in nature where as ECC has an appreciable ductility. Flexural strength of ECC is 60% more than conventional concrete, though compressive strength of ECC and conventional concrete is nearly same. Split tensile strength of ECC is about 32% more than conventional concrete. The cost of ECC is nearly two to three times that of conventional concrete per cubic yard which depends on availability of fibers, fly ash. However initial construction cost saving can be achieved through smaller structural member size,



reduced or eliminated reinforcement elimination of other structural protective system. The advantages offered by ECC over conventional concrete become even more compelling. Also use of fly ash leads to less environmental impact because disposal of fly ash is serious issue, hence Eco Friendly.

AGROBOT STRAWBERRY PICKER

(Asst. Prof. Pranali Seth)

Everything today is smart and autonomously controlled by robots. Machines are now more than integral part of this generation. One more such smart and autonomous robot is the AGROBOT. Agrobot is a machine which is used to pick strawberries. With agrobot, everything, apart from the selecting and packing, is done automatically. In order to protect the berries from squeezing or falls, they are cut from their stems by two thin, razor-sharp blades. They are immediately caught in a tiny basket lined with rubber rolls, which places the fruit on a conveyor belt leading to the packaging area. Operators



can directly select and pack the fruit into trays. There is space for two farm workers on the machine, although it can be operated by just one person. Robotic arms control the interactions of blades and baskets with the berries. A camera-based vision system analyses each fruit individually, checking form and colour, and then orders the precise cutting movements when a ripe berry is found.

FABRICATION AND TESTING OF SILICON BASED MICROCHANNEL HEAT EXCHANGER

INSPIRED BY LEAF VENATION PATTERN FOR ELECTRONIC COOLING

(Research paper by Dr. S.S. Mohite, Dr. S.D. Ghogare, Dr. V.P. Gaikwad, Dr. S.P. Vartak)

The continuous miniaturization of electronic devices led to the ever-increasing packaging densities and associated heat flux to be dissipated upto 100W/cm². A number of microchannel heat exchanger designs are an alternative to dissipate the large generated heat flux inside electronic devices.

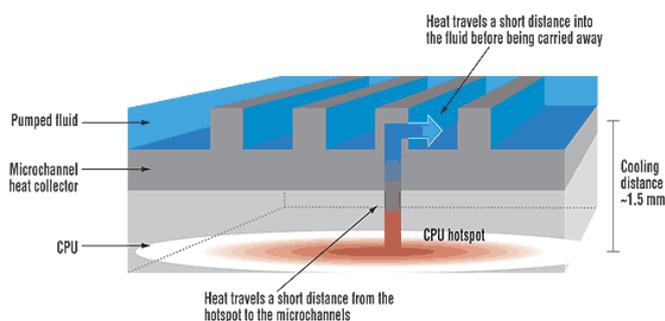
Due to recent advancements in computing technology the chip level heat fluxes have gone up tremendously and heat fluxes are expected to fast exceed 100W/cm². High heat fluxes are also found in opto-electronic equipments, high performance super computers, power devices, electric vehicles and advanced military avionics. The massive fluctuation in the equipment in addition to huge spatial variations of temperature, become responsible for malfunction and eventual breakdown of the equipment. The purpose of thermal design is to create and maintain throughout the equipment, a temperature distribution having confined variation around a moderate degree.

Micro heat exchangers are becoming an important area of interest in many fields in development and technology that require compact high heat energy removal solutions. Natural pattern leaf shape microchannel heat sinks are the area of current interest due to combination of innovative cooling technology for removal of large amount of heat from a small area and attaining the uniform temperature distribution condition. Numerical analysis of the leaf pattern micro channel heat sink shows the uniform temperature distribution over entire surface of heat sink.

Micro profiles and micro channels have wide applications in micro fluidics, bio medical and engineering sector. Surface texture, cross sectional geometry have strong impact on flow behaviour specially, close to the wall boundaries. Flow in micro channels are of interest

in wide range of areas such as aerodynamics micro fluidics, propulsion, micro spray, micro biology, microelectronic cooling, fuel cell technology and chemical analysis, bio-MEMS (biomedical microelectromechanical systems) and bio fluid mechanics.

The TMAH (tetramethylammoniumhydroxide) etching and LASER for fabricating the microchannels were compared with respect to dimensional accuracy, profile of channel, surface roughness, aspect ratio, material compatibility and cost. The results show that for silicon micromachining, TMAH etching results in taper cavity instead of rectangular cavity, finest surface smoothness (8nm), low aspect ratio (0.33-0.8), better dimensional accuracy and well suited for batch fabrication. While, LASER results in smaller taper profile (10 to vertical surface), higher aspect ratio, rough surface (2.83 micrometer), best dimensional accuracy and thus well suited for job production.



APPLICATION

Cooligy's high efficiency MEMS heat exchanger was designed for maximum removal of heat from a CPU with minimal heat exchanger area. It uses a pump driven liquid coolant that flows through its 50- to 150-micro meter wide channels made by deep reactive ion etching. The distance between the CPU's hot spot to the collector that carries the heat away is minimized to just 1.5mm.

CREATIVE BLOGS AND SITES FOR INNOVATION AND INSPIRATION

- Innovation Excellence (innovationexcellence.com)
- Mashable (mashable.com)
- Time (time.com)
- The Webby Awards (webbyawards.com)
- Speckboy (speckyboy.com)
- FastCo (www.fastcompany.com)
- Mixergy (mixergy.com/goto/welcome/)
- Brain Pickings (www.brainpickings.org/)
- 99u (99u.com/)
- Creativation Space (<http://creativationspace.com>)
- Information is Beautiful (<http://informationisbeautiful.net/>)

HAPPENINGS

CLUB ACTIVITIES

THE DAIS

The DAIS club is an MUN-based club formed in our institution to provide the students a platform to improve their oratory skills and develop their person-



Prof. Kumthekar addressing students during DAIS inauguration

ality. The DAIS club was founded under the valuable guidance of Prof. Uma S. Patil. Various sessions related to the development of professional skills which include group discussions, debates, skits, etc. are regularly conducted under this club. Sharing of theme based ideas and their demonstration publicly is the basic idea behind this club. The club is committed to conduct guest-lectures from corporate professionals and distinguished alumni of the college. It is also intends to start a competitive exams wing which will facilitate students to express their views regarding various significant socio-economic, political and other general matters. There are plans to form a WRITERS' WING to give the students an exposure to showcase the power of pen by sharpening their analytical skills and contribute its share towards making of revolutionary personnel.

STARTUP

The motive of this club is to encourage entrepreneurship in our campus, under the virtuous guidance of Prof. A. B. Patil. The inauguration was accompanied by guest lecture by Mr. R. G. Shende on the same topic. Entrepreneurship Development workshop was conducted on 3rd September 2016 which recorded the participation of 250 students from



our college. The club also encouraged two startup plans for MINDSPARK'16 event of BHAU Institute, COEP. One our project was shortlisted amongst top 7, which was a micro hydro water conservator. This project attracted a lot of investors to inculcate their ideas in future as prototype. Winners were media-box from Pimpri-Chinchvad College of Engineering, with help from Maharashtra Institute of Technology, cow dung collector machine from Beed and small spark concept from Kolhapur. 3DPLM Software Solutions Private Limited in collaboration with Dassaults Systems demonstrated the software Solid-Works, which was available for every engineering sector.

ROBO-CLUB

The ROBO-club was formed in our institution in the academic-year 2015-2016, under the dynamic guidance of Prof. G.S.Dhende and Prof. C.A.Jabhulkar. The



ROBO-CLUB session being conducted

main objective behind forming this club was to spread awareness and motivate students to study and understand robotics. This club aims to develop application based knowledge and abilities, by directly getting the students to build and implement basic circuits. This club involves its members into various events conducted in regional colleges. ROBOCON 2016 conducted at MIT, PUNE was the first international level event the members of ROBO-CLUB participated in, and bagged the 58th position. The club is also planning for ROBOCON 2017. ROBOEXPO, an exhibition was also conducted by this club on the eve of Independence Day, 2016, wherein various different robots were on display. This club also works on various projects including autonomous robots, Bluetooth and Wi-Fi controlled robots. In the first week of October, 2016 the ROBO-CLUB conducted a two day workshop on 'MATLAB and Image Processing'.

AEROBICS

This club was started to improve physical fitness of girls which is started under the efficient guidance of Prof. S. B. Karadkar.

A Training program of one month was conducted under this club also a guest lecture on 'importance of exercise and diet' was conducted by an aerobic trainer, Tasmee Sayyed on 5th October, 2016.



BRAIN STORMER'S CLUB

Brain Stormer's Club was formed under the efficient guidance of Prof. A.A. Sapkal, Asst. Prof. MED. The motive of this club is to nurture innate talent of the students of GCEK. This club conducts activities related to aptitude enhancement. This club also conducts guest lectures guiding the students to develop and improve aptitude, logical reasoning and general knowledge.

ACM CHAPTER

The Association for Computing Machinery (ACM) is the world's largest scientific and educational computing society and is solely dedicated to computing. . GCE, Karad was presented with a charter on 25th April, 2016, by Mrs. Arati Dixit, President, ACM Chapter (Profes-



Mrs. Aarti Dikshit inaugurating the ACM chapter



Lecture by Mr. Nanaware on website development

sional), Pune. The first workshop of the ACM program series was conducted in our college on 26th August, 2016 by Mr. Hrishikesh Mahajan on installation of operating systems, dual booting and working with Virtual-Box. The second workshop was conducted on 22nd and 23rd October, 2016. It was based on website development and was conducted by Mr. Suraj Nanaware. ACM COMPUTE 2016 was a national conference conducted by ACM, India from 21st-23rd Oct, 2016 at Dhirubhai Ambani Institute of Information and Communication Technology, Gandhinagar, Gujarat. The main objective of the conference was sharing experiences, ideas and innovations under different ACM Student Chapters all over India. A total of 38 students represented their institutions where the exchange of information, ideas and chapter activities took place. Kalli Avinash Krishna, a student from second year, IT represented GCEK and gave a small talk on future scope at ACM, GCEK.



Mr. Avinash speaking about GCEK ACM

total of 38 students represented their institutions where the exchange of information, ideas and chapter activities took place. Kalli Avinash Krishna, a student from second year, IT represented GCEK and gave a small talk on future scope at ACM, GCEK.

ISTE CHAPTER

The Indian Society for Technical Education (ISTE) is the leading National Professional non-profit making Society for the Technical Education System in our country with the motto of Career Development of Teachers and Personality Development of Students and overall development of our Technical Education System. A guest lecture was conducted under ISTE in the Department of Electronics and Telecommunication on 23rd September, 2016 on C language by Prof. Mr. Sandip Thorat. A second session was conducted on the same day on the topics Storage classes and Functions, Preprocessor directives, and Array and Pointers. A guest lecture was also conducted on 4th October, 2016 on 'POWER OF HABITS'. Both the sessions were huge success and was attended by many students.



Guest lecture on C programming



Guest lecture on 'Power of Habits'

DIVINE CLUB

The motive of this club is to arrange social events, provide career guidance and technical education at remote places. This club is active under the efficient guidance of Prof. A.B. Patil and Prof. S.R. Suryawanshi. The club members have surveyed 9 villages till date which includes details like population, various government schemes implemented, etc. Following are the villages that were surveyed: Banwadi, Goware, Tembhu, Koparde, Rajmachi, Shahapur, Narsinhpur, Sawarde and Satave.

PLACEMENTS AT GCEK

GCE, Karad is receiving good response from various leading recruiters like Shapoorji Pallonji Company Limited, Jade Global Software Private Limited, Wipro Ltd., Volante Technologies, Faurecia, Tech Mahindra Limited, Kalpatru Power Transmission Limited, L&T InfoTech, Persistent System Limited, BVG India Limited, etc.

The placements are as follows:

Shapoorji Pallonji Company Ltd-10 students
 Jade Global Software Private Ltd (26th Sept)-06 students
 Wipro Limited (28th & 29th Sept)-17 students
 Volante Technologies (3rd & 4th Oct)-03 students
 Faurecia (14th Oct)-06 students
 Principal Financial Group (13th & 15th Oct) -05 students

GLIMPSES

NSS AND CSP



Blood Donation Camp at GCEK under NSS



Tree Plantation (1st July, 2016)



Presentation on Computer Basics under CSP to students in Kudal

CLUBS



Aerobics training program (August 2016)



Debate session under DAIS club



MATLAB workshop under ROBOCLUB (1st-2nd Oct, 2016)

EVENTS



Engineers' Day (I.T.) (15th Sept, 2016)



Teachers' Day (CIVIL) (6th Sept, 2016)



NBA Accreditation committee visiting GCE, Karad



3D Printing Workshop Hyderabad



MATLAB and Image Processing Workshop (1st-2nd Oct, 2016)



ASCENT Ganesh making

CULTURAL



2nd Prize in Dance Competition
RIT, Islampur



3rd Prize in One Act Play Youth
Festival, Koregaon



Basketball runner-up
Team(zonal)

TECHFEST



Robot (Pick and Place) assembled
by students of GCEK



Students representing
GCE, KARAD



Volleyball runner-up
Team(zonal)

INAUGURATION



I.T.S.A.
(23rd August, 2016)



M.E.S.A.
3rd August, 2016



Chess runner-up
Team(zonal)

NBA COMMITTEE



Electical Faculty initially with
NBA Team



NBA Committee visiting the
GCEK campus



Table tennis doubles
SPUNK at RIT, Islampur

SPORTS

RATIOCINATE

The following are a few real life problems faced by a common man. We would like our readers to think over these problems and try to find innovative solutions to them which can be implemented in the real world.

1. In our college, we use huge amount of paper for submitting documents for assignments, projects, examinations, etc. Once these papers are evaluated by the respective authorities, they are simply piled up and stored as heaps of papers or disposed. Saving paper is an essential today as trees are cut for paper production. Suggest innovative solutions to reduce this wastage of the paper.

2. Saidapur, a village in Karad, does not have a well-developed drainage system, unlike Karad city. Due to this, the local public faces many problems related to health and hygiene. Suggest measures to take care of the drainage problems in Saidapur apart from installation of the conventional drainage system.

3. Manholes are an essential part of underground services like water, sewers, electricity and especially drains. It is usually observed that these manholes are not covered as the covers get stolen and are sold as scrap (if made of iron) or they break (if made of concrete), which is a cause of many major accidents. List measures to prevent this sort of accidents.

4. Smart Campus: A smart campus requires smart teachers, smart technology and smart pedagogical centers. A smart campus provides its students with reliable services anytime. Also Internet is accessible at any point of time. Suggest new ways in making our college campus, a smart campus.

Submit your solutions to us at gcek.teamherald@gmail.com. The best ones will be published in the upcoming issue.

FROM THE TEAM

Hi Readers!

We, Team HERALD, are glad to present the first issue of GCEK HERALD. Through this newsletter, we aim to spread awareness amongst the students regarding the technical advancements and trigger the curiosities of students which will help them broaden their perspectives about engineering and think about various possibilities.

GCEK HERALD won't be a change but a revolution brought in. This issue of GCEK HERALD is based on innovation. The next issue of GCEK HERALD will be based on SMART CAMPUS. We wish to provide the students of our college, a platform to express their ideas and submit it to us in the form of articles. Articles related to this theme can be submitted as soon as possible. You can submit your valuable feedback and contact us at gcek.teamherald@gmail.com.

TEAM HERALD



Dr. Raj Kulkarni



Krushna Tondare



Saurabh Mane



Sachin Nile



Avinash Ghagane



Nikita Umredkar



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Parikshit Ghodake



Namrata Pyarani



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