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NBA NATIONAL BOARD OF ACCREDITATION

DEPARTMENT OF ELECTRONICS AND COMMUNICATION

EXPLORE, DREAM, DISCOVER

ISSUE 46 MONTHLY NEWSLETTER NOVEMBER 2021

GENESIS

IGNITING THOUGHTS

CONTENTS

Vision:

To be recognized at national and international level for excellence in education and research in Electronics and Communication Engineering.

Mission:

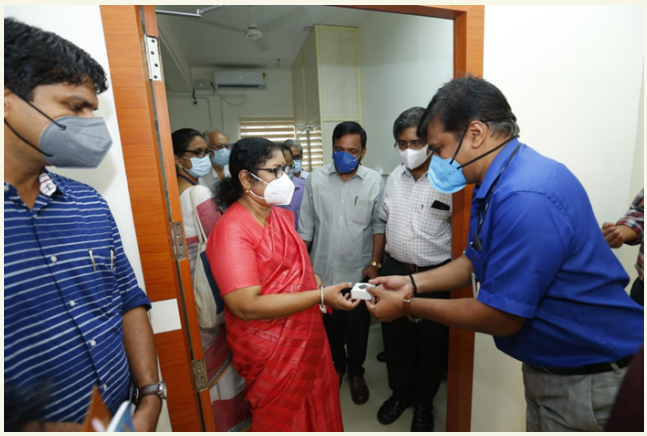
- Inculcating leadership qualities, adaptability and ethical values
- Imparting quality education in the field of electronics, communication, and related areas to meet the challenges in industry, academia and research
- Nurture the growth of each individual by providing a dynamic and conducive learning environment.

.

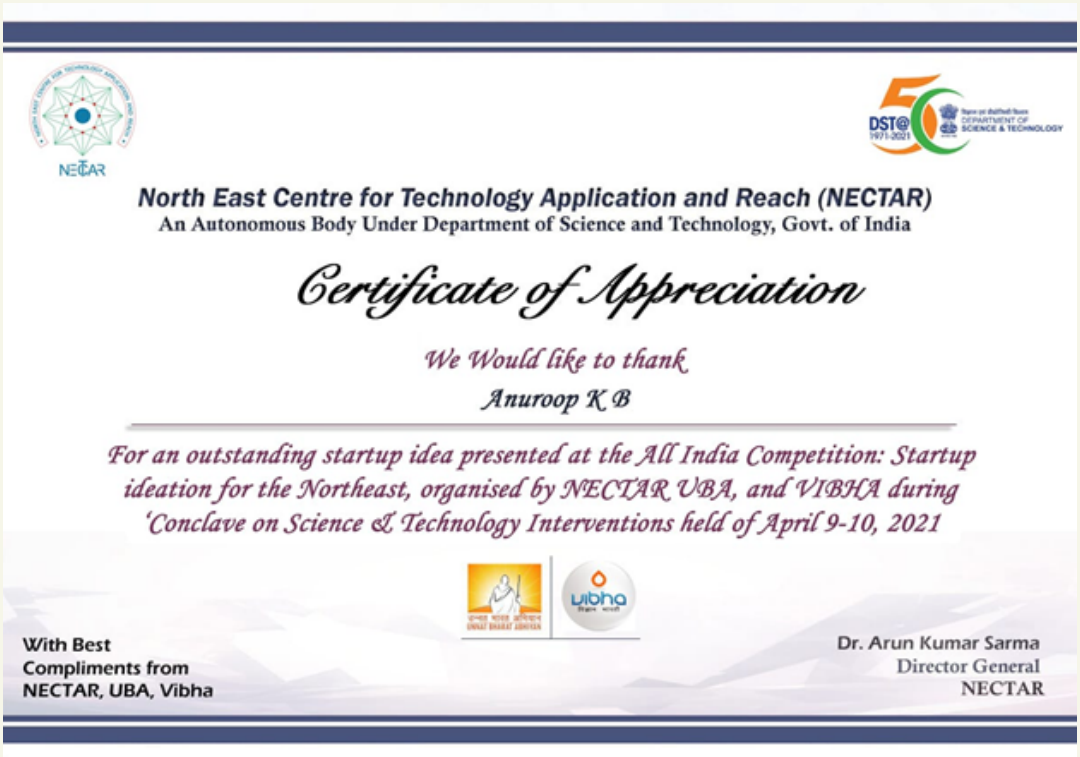
DEPARTMENT ACTIVITIES & ACHIEVEMENTS

HAPPY NEWS!

Dr. Gopakumar VT, Professor ECE department, handed over highly accurate, low cost USB charging Pulse Oximeter with high contrast OLED display (developed by him at CUSAT TBI CITTIC, CUSATECH foundation) with a RUSA seed funding of Rs 2lakh to Minister of Higher Education and Social Justice, Kerala Dr. R Bindu. Mechanical design and 3D printing were done at our FAB lab by Mr. Anurup, Faculty, Dept of ECE, ASIET.



Our startup Idea selected as outstanding startup Idea (National Level) in the event Startup Ideation for the Northeast organised by NECTAR, Unnat Bharaty Abhiyan and VIBHA during " Conclave on Science and Technology Intervention " held on April 9-10th April, 2021 at Shillong, Meghalaya.



North East Centre for Technology Application and Reach (NECTAR)
An Autonomous Body Under Department of Science and Technology, Govt. of India

Certificate of Appreciation

We Would like to thank
Anuroop K B

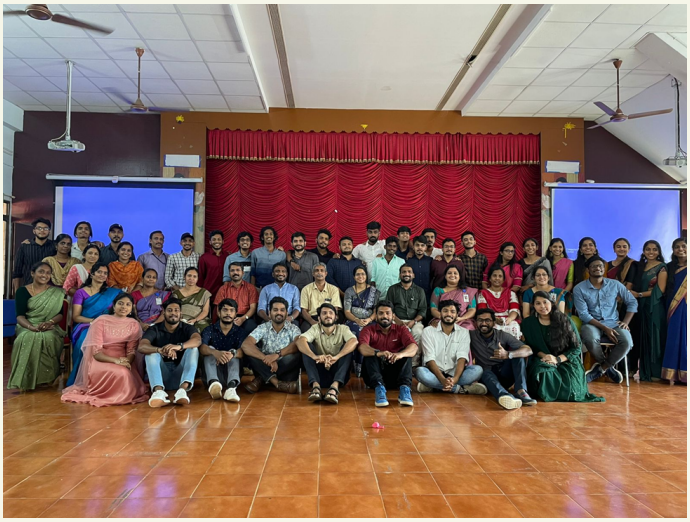
For an outstanding startup idea presented at the All India Competition: Startup ideation for the Northeast, organised by NECTAR UBA, and VIBHA during 'Conclave on Science & Technology Interventions held of April 9-10, 2021

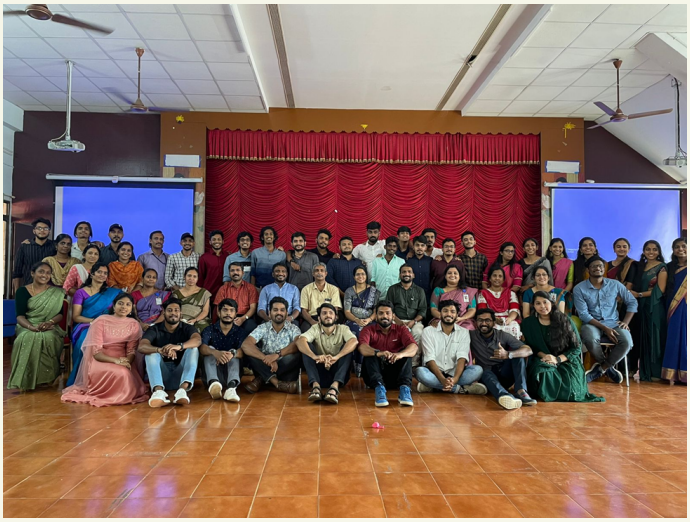
With Best Compliments from NECTAR, UBA, Vibha

Dr. Arun Kumar Sarma
Director General
NECTAR

FAREWELL-2017-2021BATCH

The get together of our 2017-21 batch B. Tech& M. Tech students arranged on 5th November 2021, 1.30pm at College Auditorium. Department toppers and Btech honours students honoured in the ceremony.



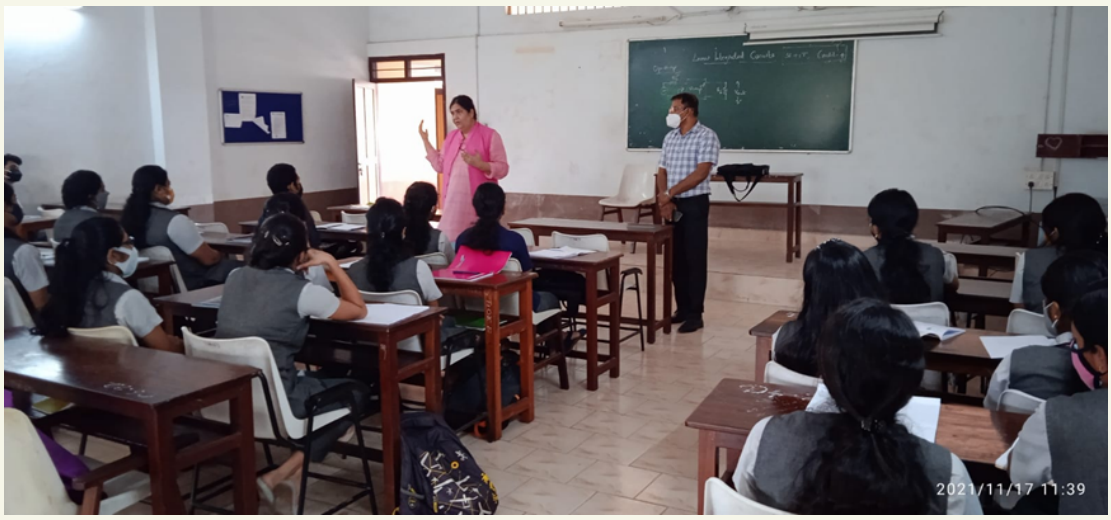


FIRST YEAR INDUCTION--16/11/2021

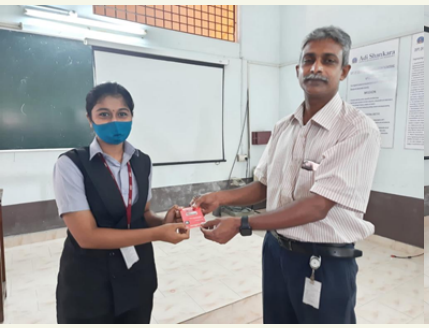
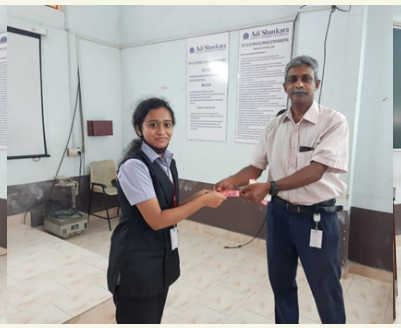
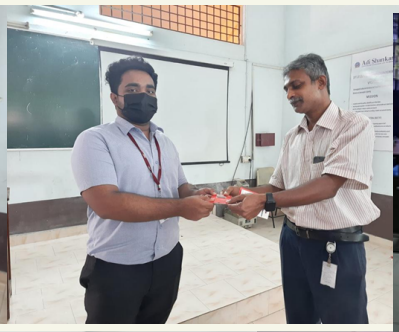
Our department conducted induction programme for first year students (2021-2025) Batch. The induction program included sessions like department orientation, hostel admissions and bus facility formalities etc. The program started with welcome speech by HOD Dr. Bobby Mathews. He gave an overall idea about different activities, funding, placements that are accompanied by our college and the dept. After the welcome speech students were guided to their respective classes by the tutors, and they gave a brief description about the KTU Curriculum regarding academics, their syllabus etc.

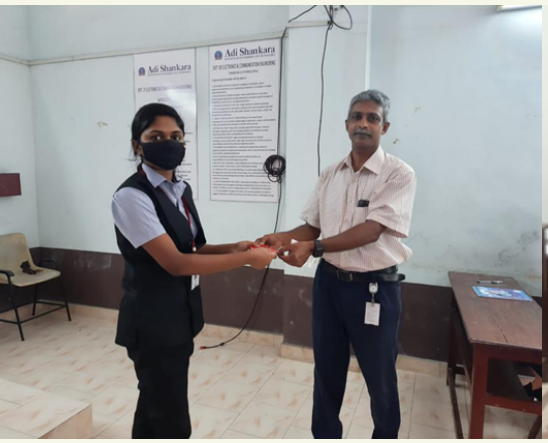
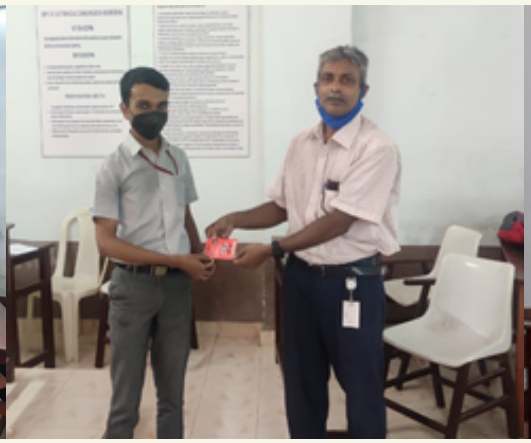
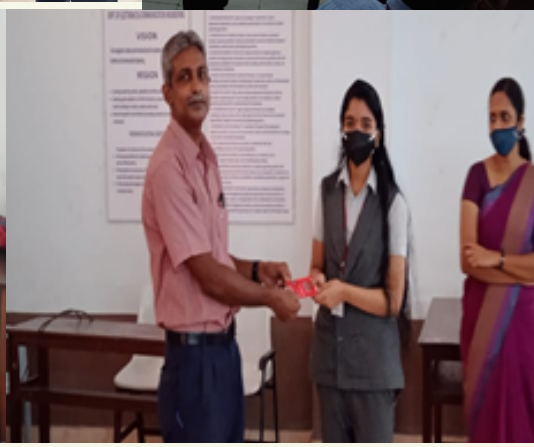
INTRODUCTION TO DRONE PILOT COURSE

An introduction to Integrated Drone Training Academy by Squadron leader Varsha Kukreti, Indian Airforce (Retd.) was conducted for ECE department students on 17/11/2021.



APPRECIATION TO UNIVERSITY TOPPERS IN EACH SEMESTER

Let's !

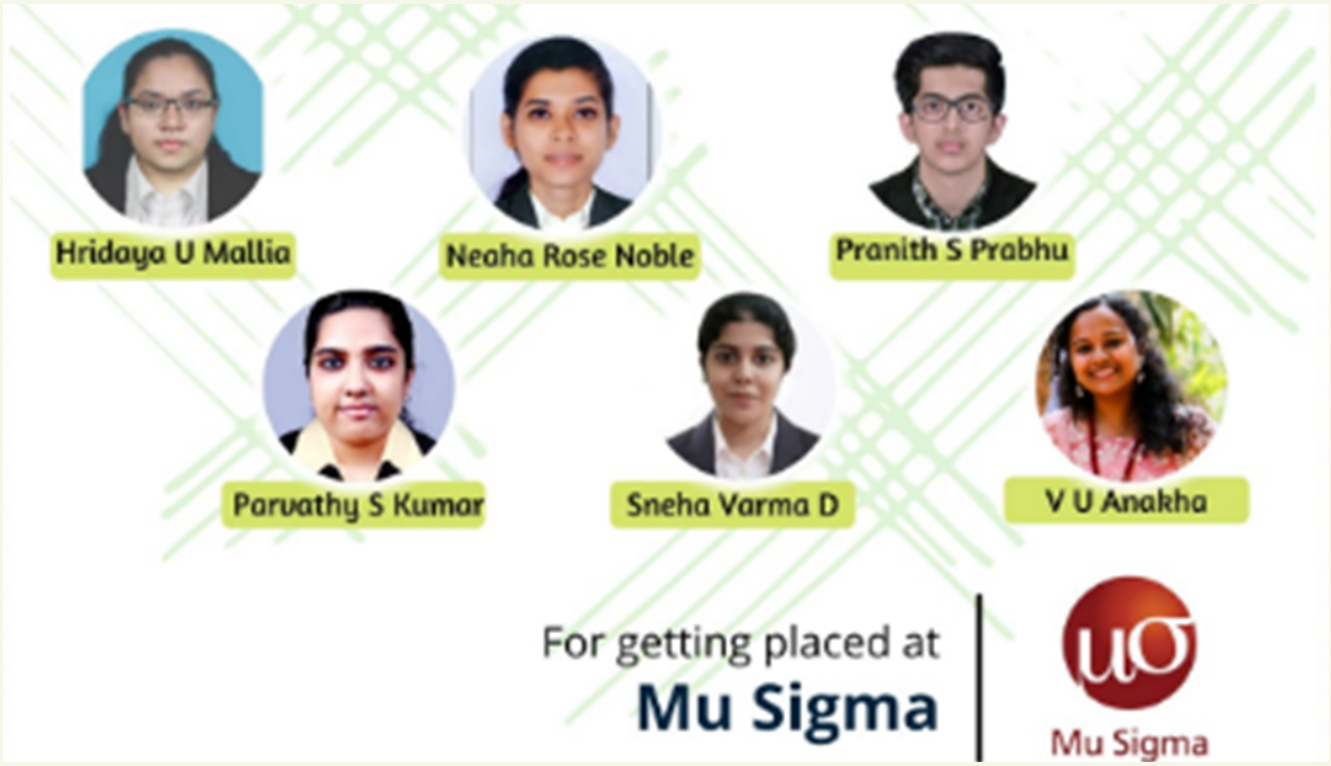
CONGRATULATE

Ann Mary Paulose

Power Quiz (College Level) competition Winner conducted by KSEB officer's Association on October 31st 2021

Megha Sunil

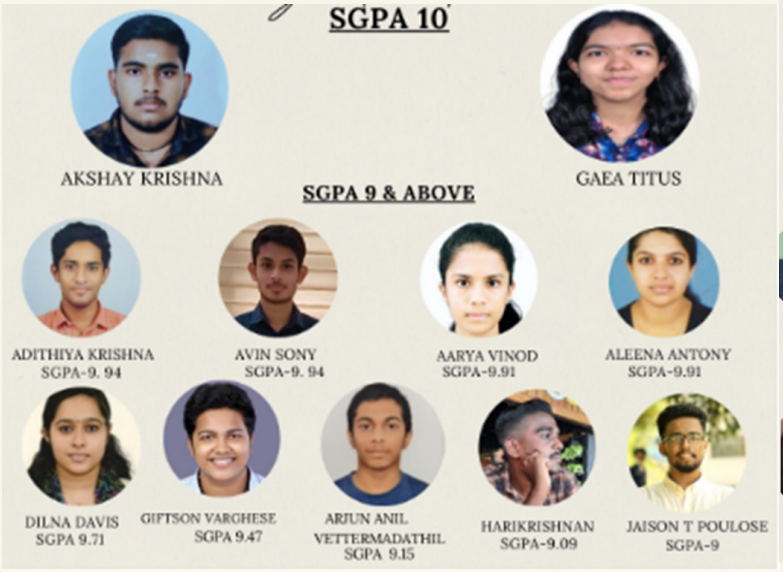
(17-21 Batch) Placed in TCS

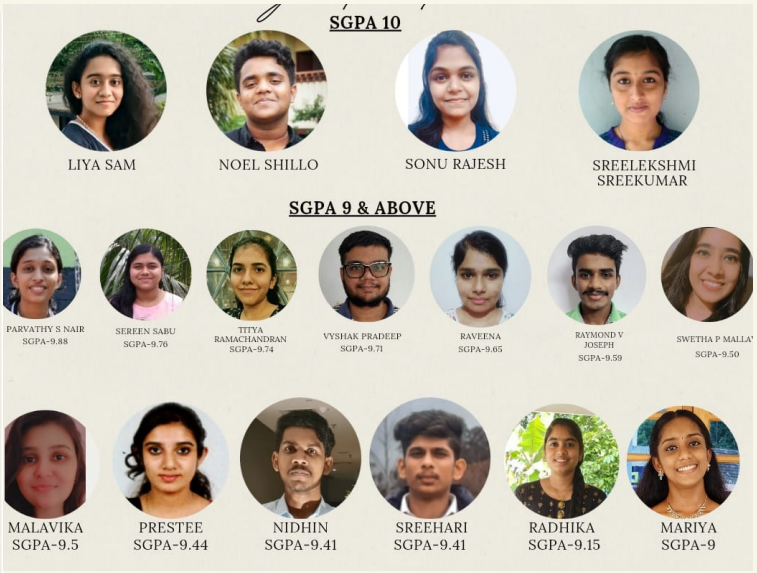



Anakha K Wilson
Aushin Jose Manjooran
Neelima Sunil
Parvathy S Kumar
Sneha Varma D
V U Anakha
For getting placed at
TATA Consultancy Services
tcs
TATA
CONSULTANCY
SERVICES


Malavika J
Mishal C J
For getting placed at
QuESt Global
QUEST
BORN TO ENGINEER

S1 UNIVERSITY EXAMINATION TOPPERS





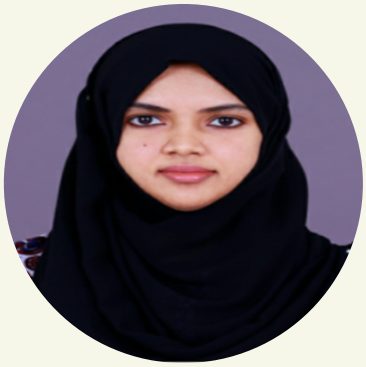
M TECH UNIVERSITY EXAMINATION

S1 M TECH VLSI ENGINEERING SGPA ABOVE 9

SUKANYA – SGPA 9.74

S1 M TECH COMMUNICATION ENGINEERING SGPA ABOVE 9

VISMAYA-SGPA 9.35



HASNA HAMEED SGPA 9.28

SYETHIMA K.R SGPA 9.0

TECH TALKS

TEACHER'S ZONE

PROGRAMMABLE SOFT MAGNETIC PIXEL ROBOT

Author: Dr Arya Devi P S,Associate Professor, Dept of ECE

Soft robots are robots made from compliant materials instead of rigid materials so that they can adapt to and work well in an ever changing environment. They are constructed from liquid crystal elastomer infused with carbon nanoparticles, thermal actuators, and silicon-based light sensors. They can find their application in medicine & health care, search & rescue, space exploration and various other areas. Magnetic soft robots change their shape or accomplish diverse actions depending upon the magnetic field applied to them. Several features, like fast response, no obstruction restriction, high elasticity and unlimited endurance become characteristics of these robots. They find applications in cell manipulation, medical image acquisition, drug delivery and non- invasive intervention.

The motion of a magnetic soft robot is the result of applied magnetic field on magnetic particles wrapped in a flexible lattice. These particles can be soft magnetic materials like magnetite or hard magnetic materials like neodymium(NdFeB). The soft robot using hard magnetic materials has high residual magnetization. Its programmable shape control is done by arranging the magnetic anisotropy. The magnetic anisotropy distribution is not changeable so a phase-transition polymer is introduced. By heating, magnetic particles become free domains, can be reoriented, and be locked after cooling.

The programmable soft magnetic robot is fabricated with magnetic pixels, i.e., particles comprising a liquid metal and a neodymium magnet (NdFeB), and an elastic lattice made from silicon. Each and every magnetic pixel is magnetizedindependently, using a method called laser-aided heating.

As shown in the figure, the film has a discrete lattice structure, each basic cell is called a magnetic pixel. In each magnetic pixel, the NdFeB microparticles are wrapped and uniformly distributed in the liquid metal matrix. When heating a certain region of the materials by the laser, gallium can be transformed from solid to liquid phase. Then NdFeB particles will be reoriented under the programming magnetic field, and form macro magnetic anisotropy in the heated region. Here, the required heating temperature is only 40 ◦ C. When the magnetization process is completed, the laser stops working, and the liquid-metal is converted into solid phase again under the action of semiconductor cooler. By repeating this process, we can program different magnetic anisotropy in the film. By programming on region I and region II of the film respectively, the residual magnetization with vertical and horizontal directions is obtained. Finally, under the exiting of the vertical magnetic field, a simple bending action is generated.

The response activities and jobs of soft robots can be reconfigured by programming. The use of single pixel or multi-pixels decides the scaling of robots and addition of flexure pivots between magnetic pixels give an exceptional hardening role. The robot maintains a fixed shape, by shifting to its 'rigid body' mode. Furthermore, both its magnetization and toughness can be effortlessly programmed.

In the future, micro-scale magnetic soft robots could be employed in a variety of uses viz., helping humans to supervise the environment or to remotely perform biomedical procedures. Most of the systems developed so far, nevertheless, can only complete simple tasks and take on a limited number of shapes. This is one of the promising areas of research in the future.

References

1. Simon John "Soft robotics: Everything you need to know", July 2020, https://techfruit.com/focus/soft-robotics-everything-you-need-to-know/
2. Ingrid Fadelli, "A soft magnetic pixel robot that can be programmed to take different shapes", Nov 2021, https://techxplore.com/news/2021-11-soft-magnetic-pixel-robot.html
3. Ran Zhao, Hanchen Yao, Houde Dai, Shape programmable magnetic pixel soft robot. arXiv:2111.00422v2 [cs.RO], arxiv.org/abs/2111.00422

STUDENT'S ZONE

FIBER OPTICS- A revolutionary for Communication Industry

Author: Jaison T Paulose, ECA S3.

Fiber optics has come a long way in the nearly three decades. For many years the field grew steadily, with new technology creating new applications, and new applications, in turn, supplying money to develop more new technology. The growth sped out of control in the late 1990s as the Internet fed a seemingly limitless thirst for bandwidth that only optical fibers could provide. We told ourselves that the communications industry was in better shape than the dot-coms because it had real hardware, not just websites. Then the industry ran right off a cliff and landed with an ugly splat.But fiber-optic technology remains healthy, with advances continuing at a more sober rate. Fiber optics has become the backbone of the global telecommunications network, giving us instant access to websites and telephones around the world. That network continues to reach toward homes and businesses. Cable television companies, telephone companies, Internet providers, and power companies have their own fiber-optic networks. When you use a cell phone, your calls usually go wireless only to the tower, where a fiber-optic cable runs to the backbone telephone network. The demand for bandwidth continues to rise, although there's a lot of surplus fiber in the ground right now. Fiber revolutionized telecommunications in the twentieth century, just as the railroads revolutionized transportation in the nineteenth century. Overbuilding of railroads caused spectacular busts in the latter half of the nineteenth century, but railroads remained the backbone of the national transportation network until the spread of the interstate highway systems.

Fiber optics did not begin as a communications technology. Optical fibers evolved from devices developed to guide light for illumination or displays, and were first used to look inside the human body. Bundles of optical fibers are still used to examine the stomach and the colon because they can reach into otherwise inaccessible areas. It's worth looking at how this idea began— it will teach you the basic ideas of light guiding in a fiber.we already have a lot of sources of light in our day to day life, for e.g. incandescent bulbs, gas bulbs, LEDs, fluorescent lamps, etc. Then why worry about sources? Fibers are also used for illumination and are wrapped in bundles so that they may opt for a variety of other applications,including sensors and fiber lasers. They are used as light guides in medical and other applications where bright light needs to be shone on a target without a clear line-of-sight path. Many microscopes use fiber-optic light sources to provide intense light.

But how do optic fibers work?

Light travels down a fiber optic cable by bouncing off the walls of the cable repeatedly. Each light particle (photon) bounces down the pipe with continued internal mirror-like reflection.

The light beam travels down the core of the cable. The core is the middle of the cable and the glass structure. The cladding is another layer of glass wrapped around the core. Cladding is there to keep the light signals inside the core.

Let's understand the fiber broadband in our home works.

Does fiber broadband make a difference? Well, if you're in a shared house or have a family, you're probably using more than one device to connect to the internet. Now imagine the same thing happening in homes across the country at specific times of the day. Connecting to your home broadband at peak times could mean slower download speeds.

Frustrating, right? Imagine if you're in the middle of downloading some critical files for work and your connection is slow. And if you're streaming, you might feel you're falling behind all your friends who've seen the latest must-see TV.If this sounds familiar, then fibre broadband might be right for you.

It uses a network of fiber optic cables to deliver high-speed data over greater distances. The data travels down the cables literally at the speed of light. This means you're more likely to get faster download speeds and a more reliable connection to the internet. We all have come across the term FTTP or FTTH, it's nothing but Fibre To The Premises. It's sometimes known as FTTH (Fibre To The Home), or ultrafast broadband. With FTTP, fibre optic cables run right into your home. This means much faster fibre broadband.

Advantages of optical fiber

Fibre optic cables are stronger than standard copper phone lines. This makes them more resistant to electrical interference and cold weather – conditions that can make your broadband connection worse.

STAFF ACHEIVEMENTS

NAME	DESIGNATION	Nature of Participation/ Achievement	Title of Participation/ Achievement	Date	Organized By
VT Gopakumar	Professor	ConferencePar ticipation	BioPhotonics Conference	28-Oct	Photonics Media, Massachusetts, USA.
Prajeesh P A	Assistant Professor	Publication	Published a paper titled Design of automated stethoscope using AI ,IOT and signal processing	5/11/2021 to 6/11/2021	International conference on ESIC 2021 at KIIT Bhubaneswar,
NEEMA M	Assistant Professor	Publication	M. Neema, E. S. Gopi and P. K. Katoj, "User Spatial Localization for Vision Aided Beam Tracking based Millimeter Wave Systems using Convolutional Neural Networks," 2021 10th International Conference on Information and Automation for Sustainability (ICIAfS), 2021, pp. 7-12, doi: 10.1109/ICIAfS52090.2021.9605960.		
Neethu Suman	Assistant Professor	Short Term Training Program (STTP)	Training program on Virtual Labs	9/11/2021	Nodal centre ASIET , Kalady in association with Participating Institute NITK Surathkal
Aswathy N	Assistant Professor	Short Term Training Program (STTP)	Introductory course on Magnetic Random Access Memory	18,19,20th October 2021	S P I N T E C,Univ. Grenoble Alpes, CEA, CNRS
Jaimy James Poovely	Assistant Professor	Paper Presentation	A Survey on VLSI Architecture And Design for Data Compression	13/11/2021	Department of Robotics Engineering, Karunya Institute of Technology and Sciences,
CHINNU S	Assistant Professor	Paper Presentation	A Survey on VLSI Architecture And Design for Data Compression	13/11/2021	Department of Robotics Engineering, Karunya Institute of

STUDENT ACHEIVEMENTS

Student Batch	Name	Title of Course attended	Conducted By
2018-22	ASWANI M RAVI	Introduction to Internet of things	NPTEL
2019-23	P S INDRAJA	SPACE SOLAR POWER	ZINDOT TECHNOLOGIES
		EMBEDDED SYSTEM	
		BIO CHIP TECHNOLOGY	
2020-24	JAISON T POULOSE	Google Devfest India 2021	Google Developer Groups
		Quiz Zone	IEEE Kochi Hub
		Machine Learning Bootcamp	learnmall
2020-24	VYSAKH PRADEEP	Rapid Manufacturing	NPTEL, IIT Kanpur
2018-22	ANJANA VP	Introduction to internet of things	Indian institute of technology kharagpur

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S5 EC B

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S3 ECB

Ms Dilna Davisal
S3 ECA

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