VIDYA PRATISHTHAN's KAMALNAYAN BAJAJ INSTITUTE OF ENGINEERING AND TECHNOLOGY, BARAMATI

Department of Electronics and Telecommunication Engineering

ELECTRONICA
July 2022

VPKBIET

Department of Electronics and Telecommunication Engineering

About Department:

Electronics And Telecommunication Department was established in the year 2000. The intake for under graduate course is 60. Electronics And Telecommunication Department is committed to provide quality education in the field of Telecommunication. The strength of the Department is qualified and devoted faculty, motivated students and well equipped labs Our faculty and students work together to study, experiment and to solve problems in the various fields such as Networking, Security, Information Retrieval, Image Processing and Pattern Analysis.

Mission:

To develop professionals in Electronics and Telecommunication Engineering to contribute in solving technological problems faced by society.

Program Educational Outcomes:

➢ To apply the knowledge of Electronics and Telecommunication Engineering to build career in core and allied industries
➢ To prepare students for higher studies, competitive exams and multidisciplinary work
➢ To follow professional ethics and address social concerns
➢ To be lifelong learner to engross newer technologies

Department of Electronics and Telecommunication Engineering

Program Specific Outcomes:

PSO1: To develop competencies to solve real-life problems in the Electronics and Telecommunication Engineering domain at the same time inculcate professional behavior imbibe with human values and ethics   .

PSO2: To acquire the knowledge of embedded systems, communication, signal processing for hardware/software design and development.

PSO3: To demonstrate the competencies to use modern tools and techniques to design electronic systems in diverse fields as per societal needs.

Principal's Desk

Dr. R. S. Bichkar
Principal,
Dept of E & TC Engineering
VPKBIET, Baramati.

I am pleased to hear that, Department of Electronics and Telecommunication Engineering is publishing the July 2022.issue of department magazine, 'Electronica'.

I feel very elated and at the same time privileged to share a few words as you go through the pages of the magazine "Electronica". Electronics and Telecommunication department endeavors to help students to seek the best from the surroundings. The knowledge thus gained becomes a ladder for them to soar into greater heights. It's often the collective effort that leads to the discovery and fulfillment of aspirations.

I am sure, the task force of Electronics and Telecommunication l Engineering department has taken lead, to one of the best examples of not only the land of ideas but the forest of excellent products

Vice-Principal's Desk

Dr. S. B. Lande
Vice-Principal,
Dept of E & TC Engineering
VPKBIET, Baramati.

I am delighted to announce that the Department of Electronics and Telecommunication Engineering is bringing their Technical Magazine 'Electronica' Issue-July 2022. It is a tool for faculty and students to develop productive technical materials and support skills. The most important thing you can get out of this fantastic effort is that it brings out the various technical and analytical skills of novice engineers. I am happy to welcome all the teachers, students who are more interested in bringing articles with more bright concepts and innovative ideas in the coming issues.

I wish the "Department of Electronics and Telecommunication Engineering" of this organization great success in all their endeavors. I congratulate the Head of the Department of Electronics and Telecommunication Engineering, the Editor and his dedicated committee for their invaluable efforts in bringing this issue to the fore. I wish them all success of not only the land of ideas but the forest of excellent products

HOD's Desk

Dr. B.H.Patil
HOD
Dept of E & TC Engineering
VPKBIET, Baramati.

Ever since the department of Electronics and Communication Engineering started its journey over two decades back, the department has been simultaneously and successfully performing the multiple roles of creating new knowledge, acquiring new capabilities and producing an intelligent human resource pool contributing in various domains of the society. The Department has always been on a high growth path and has experienced and dedicated faculty with strong commitment to engineering education who work with zeal and enthusiasm to provide a vibrant and optimum learning environment.

The growth of expertise in the department is commendable. In keeping with the department's vision, the holistic development of the students is focused upon that instills a habit of continued learning and a sense of responsibility in them to contribute towards the betterment of the society.

The periodically updated curriculum imparts technical knowledge to the students and the application based environment in the state of the art laboratories complements the same. The students are motivated to participate in paper presentation, workshops and seminars that are essential to maintaining proficiency. Cultural activities are also promoted through various clubs at the departmental and university level.

HOD's Desk

A strong positive reputation of the department pulls companies like TCIL, HCL, TCS, Perot Systems and many more for campus recruitment. A large percentage of students also qualify GATE for pursuing higher studies.

If you have further questions after vising our website which provides details of faculty members, research activities, research facilities and various student activities, please feel free to contact us on email address provided on faculty pages.

Dean R & D

Dr. Rajveer Shastri
Dean R & D,
Dept of E & TC Engineering
VPKBIET, Baramati.

Dr. Rajveer K. Shastri received Ph.D. in the area of underwater signal processing in 2014, from Shri Guru Govind Singh Engineering and Technology, Nanded. Since 2003, he has served at various academic levels, and currently, he is Professor at the E&TC departmentHe was awarded Summer Faculty Research Fellowship 2013 from CARE, IIT Delhi. He presented his research papers in the USA and Brazil. He visited universities abroad like North Carolina State University and Michigan Tech. University and San Jose University USA. He is currently working as Dean of Research and Development.

Objectives of Research at VPKBIET:

- To promote research and multidisciplinary projects.
- To monitor and address the issues related to research and development..
- Facilitate: Collaborations of Institute with R&D Organizations/Industry (Research and Consultancy).
- Protection of Intellectual Property / Knowledge generated at VPKBIET (Patents/copyright).
- Encourage Research Publications / Presentations in Journals/ Int. conferences abroad.

Entrepreneurship Development Cell (ED Cell)

Vision

- To develop successful entrepreneurs with integrity, innovation and leadership qualities to serve the society.

Mission:

- To inculcate entrepreneurial culture and spirit among the students by providing guidance and mentoring through various programs
- To identify the potential entrepreneurs and facilitate them the support from ideation, IPR filing to startup establishment

Short Term Goals:

- To build a sustainable ecosystem for promoting entrepreneurship culture in young minds
- To impart the entrepreneurial skills among the students by organizing workshops and seminars.
- To develop a network of set of resources including students, faculties, mentors, angel investors, venture capitalists throughs startup/technology fares, expert talks and competitions

Long Term Goals:

- To establish a sustainable technology business incubator

Entrepreneurship Development Cell (ED Cell)

Outcome of Students' Project Guided :

➢ Project titled, Sugarcane Bud Detection and Cutting Machine won Second Prize at Navonmesh 2020, organized by, Atal Incubation Center, ADT, Baramati.

➢ Project titled, Multipurpose Egg Hatcher Machine, received incubation from Atal Incubation Center, ADT, Baramati.

➢ Project titled, Underwater Robot for Scientific Data Acquisition, shortlisted in top 21 National level finalists at eYantra Idea Competition, 2019, organized by IIT, Bombay.

➢ Project titled, Underwater Robot for Scientific Data Acquisition, won consolation prize at IETE, Innovation Competition 2019, organized by, IETE, Pune.

➢ Project titled, Sediment classification using Side Scan Sonar, won third prize at IEEE project competition in Signal and Image Processing, 2015, organized by, IEEE, Pune section.

➢ Project titled, Brain MRI Segmentation, won the third prize worth $500, at IEEE MTTS video competition 2016 project competition, IEEE

Start-up Registered

➢ Aeronics pvt.ltd by Aishawarya Phulari
➢ Hatchlogic Electro Solution pvt.ltd by Paigambar Shaikh
➢ Innovatic pvt.ltd by Mosam Bhong
➢ Clover by Akshay Bhujbal,Swarali Babar, Dr.Vipin Gawande

ED Cell Coordinator

Dr. Jyoti Rangole
Dept of E & TC Engineering
VPKBIET, Baramati.

Jyoti Rangole has worked in different capacities like Head of Department, IEEE, WIE, Coordinator, PG Coordinator, Project Coordinator, Department NBA coordinator, Institute Entrepreneurship Development Cell coordinator.

She is the university level winner of Avishkar 2017 in Agriculture and Animal Husbandry, Teacher Category.

Currently she is working as institute coordinator for implementation of Innovation and Startup Policy.

Activities under ED Cell:
Expert Talk:

- Funding Opportunities for Entrepreneurs Organized by Institute Entrepreneurship Cell (ED) and Institute Innovation cell (IIC) conducted by Mr. Pradip Ingle, Regional Officer, Maharashtra Center for Entrepreneurship Development (MCED), September 2021
- "JOURNEY FROM IDEA TO START-UP" conducted by Mr. Shrirang Gokhale Mr. Gokhale is a Mechanical Engineer from COEP,69 batch. Joined Philips Bhosri in Audio Division as Product Designer., Aiugust 2021
- "Awareness Program on Intellectual Property Rights" conducted by Kalyani Ahir, Founder and CEO Synnollect Innovations Pune, August 2021
- BYST's Entrepreneur Online Learning (EOL) Programme by BYST Mentors, Jan 2021
- Webinar Series on Entrepreneurship Development ," Why to be an entrepreneur...?" conducted by Mr. Ram Bende , The Development Agency on 26th oct 2020

Infrared Thermal (IRT) Image Processing: A new gateway of Diagnosis in Biomedical Engineering and Healthcare

Nowadays, we gets diagnosis and progress reports of several diseases via advanced biomedical imaging techniques like sonography, radiology, MRI, CT scan etc. However, most of the techniques have some drawbacks. For example, frequent exposures of X-rays can start damaging human cells, and more frequency of X-ray usage may lead to cancer. MRIs cannot be used on the patients with metallic inceptions on or inside the body (like metal rod in arm, legs or braces on teeth) as the resonance effect may prove fatal to such kind of persons.

In such scenarios, infrared thermal (IRT) imaging, also known as thermography, proves very helpful. Thermograph is a picture of an object taken by an infrared thermal camera. This camera works just like our normal digital camera. The difference it, instead of capturing 'light', it captures 'heat' emitted by the objects. The principle of infrared thermography is based on the physical phenomenon that any body of a temperature above absolute zero (-273.15 °C) emits electromagnetic radiation. There is clear correlation between the surface of a body and the intensity and spectral composition of its emitted radiation. By determining its radiation intensity the temperature of an object can thereby be determined in a non-contact way. Thermography is a non-invasive, non-contact tool that uses the heat from your body to aid in making diagnosis of a host of health care conditions. Thermography is completely safe and uses no radiation.

Medical Thermography equipment usually has two parts, the IR camera and a standard PC or laptop computer. These systems have only a few controls and relatively easy to use. Thermal imaging systems are an economical easy-to-use tool for examining and monitoring patients quickly and accurately.

Utilizing high-speed computers and very accurate thermal imaging

Infrared Thermal (IRT) Image Processing: A new gateway of Diagnosis in Biomedical Engineering and Healthcare

cameras, the heat from your body is processed and recorded in the computer into an image map which can then be analyzed on screen, printed or sent via email. The picture map can then be used by a physician to identify any unusual hot or cold spots. These hot and cold areas, can relate to a number of conditions for which the Food and Drug Administration, Bureau of Medical Devices has approved the thermography procedure.

Some of the common applications of Thermography are in:

Breast pathologies (for detecting breast cancer), Extra-Cranial Vessel Disease, Neuro-Musculo-Skeletal Diagnosis, Vertebrae (nerve problems/arthritis), Lower Extremity Vessel Disease Detetction, Respiratory dysfunctions, Digestive disorders, Urinary diseases, Cardiovascular and circulatory disorders, Lymphatic dysfunctions, Reproductive disorders, Nervous dysfunctions, Endocrine Disorders, Locomotors Disorders, Surgical Assistance, Skin Problems, Ear, Nose, and Throat dysfunction, Dentistry etc.
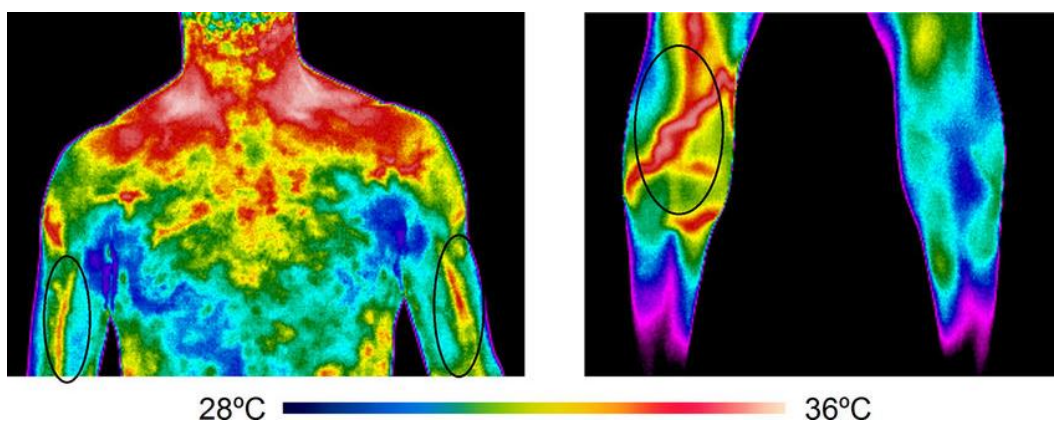

Fig. 1 Thermography can be used to detect veins in Human Body (encircled in left image). It can also detect abnormal conditions like varicose veins (encircled in the right image) (Courtesy: Felipe P. Carpes et al, "Insights on the use of thermography in human physiology practical classes", AJP Advances in Physiology Education, September 2018.)
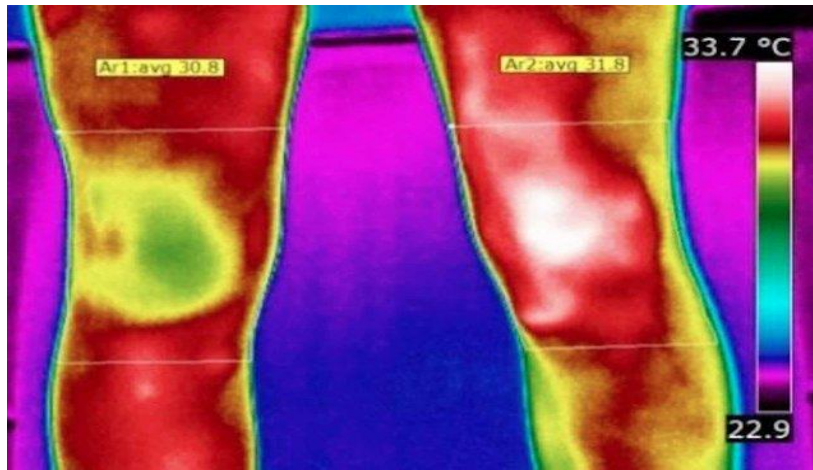
Fig. 2 Healthy right knee (Tmean=30.8 ℃) and injured left knee (Tmean=31.8 ℃) (Courtesy: Enrique Sanchis-Sánchez et al, "Clinical Applications:Infrared Thermal Diagnosis of Orthopaedic Injuries in Childhood")

For more interesting study about IRT, please visit the below references:

InfraTec website: https://www.infratec.eu/thermography/service-support/glossary/theory/

Flir website: https://www.flir.com/discover/rd-science/how-do-thermal-cameras-work/

https://www.flir.com/discover/ots/thermal-vs-night-vision/

Amit R. Chavan, Research Fellow, CSIR – CSIO Chandigarh (UT)

ME(2013 Batch)

(Alumini)

Not a huge fan of coding? This article is for you…

Tech Industry's new DIY approach – 'The No code or Low-code Revolution'

DIY , 'Do-it-yourself' , a term that each one of us have been coming across in recent days. Be it the Pinterest ideas on DIY Home Decoration or DIY Beauty care, we have all been coming across all the tons of DIY videos and have definitely tried a few during the lockdown time! Here I am to introduce you to a DIY approach that is recently been booming in the tech world with the 'No-code' and 'Low-code revolution'.

There are surely several people like me who are not quite a big fan of coding themselves. The 'No-code' revolution is for us! Before getting an insight of what no code actually is, let us understand why today the industry has been put into a dire need to have the no or low code solutions.

In recent years, there has been a BIG change in how the enterprise app development is happening. Below are few points influencing it.

1. Changing workforce: With the young generation being the major workforce in most companies, there is a huge demand for better digital experiences. Both web applications and mobile applications.
2. Surging digital demand: One of the surveys suggest that over 500 Million new apps shall be built in coming 5 years . This count is more than the apps that have been built in last 40 yrs put together.
3. Lack of enough developers: Almost all companies are facing a problem of shortage of professional developers. This is causing companies to hire people form non -technical domain to help address the lack of resource issue.
4. Covid Crisis : The economic problems and crisis during and post covid has pretty much put enormous pressure on companies .

So basically, there is a need to address the digital needs and problems with the tools, skills and people that the company already has! Companies need to develop solutions that are efficient and get more outputs from the already existing resources.

So what is 'no-code' or low-code ?

No-code is basically a set of tools which are designed so that you can create or develop applications with little or no coding knowledge at all! The low code revolution basically acknowledges the truth that instead of trying to teach everyone how to code, its better to change how you develop applications so it works for everybody and everybody can work on developing apps!

What Low-code serves?

1. **Complete democratization of application development:** Low code has helped achieve a complete democratization over app development. This means that even a nontechnical person can approach the development with the no-code tools
2. **Development as a team Sport:** With the no-code- tools, today all the work force can be made to work on a single problem statement despite them knowing the technical aspects of coding. This has proven to provide better results and more innovative solutions.

Here I would like to introduce the low-code-revolution from Microsoft perspective and the existing products that Microsoft offers.

The low-code revolution and Microsoft

In accordance to the low-code-revolution, Microsoft today has its Power platforms to server this. The Microsoft power platforms have 4 major components.

1.Power BI: This is low code way to deep dive into Business Analytics and Business Intelligence.

Power BI is a business Intelligence tool and one of the best in markets. It helps to create reports and dashboards. It helps in the data cleaning, data modelling and data visualization and offers automation capabilities. This is one of the tool used to understand and play with the enormous data generated in an enterprises.

2. Power Apps: It is a low code way to build mobile applications. Power apps is basically a suite of apps, services, connectors and data platforms which provide an application development environment to build custom apps for an organization. Here if you can use power point and excel application well, you can build a mobile application using it!

3. Power Automate: It uses robotic process automation, API based automation, to automate all parts of the business process and workflow to improve efficiency of existing workforce. It is basically a software by Microsoft for automation of recurring tasks.

4. Power Virtual Agents: It is a low-code way to build chat box. Power Virtual Agents lets you create powerful chatbots for a wide range of requests.   It offers AI driven conversation experience like Alexa or chat-based experience on websites.

To sum up, I would like to leave you with this realization that there is no more room for you to get excused from getting things done by merely mentioning that you are not good at coding! You need to just DIY – Do it yourself. The good note is that it does not have to be very excruciating. We have all types of tools out there in the market. It's just a matter of researching, finding out what tool works best for you , grabbing the tool and just creating! Hope that we are able to make use of these tools to the best of our capabilities and open doors to some very exciting entrepreneurial advancements.

Mss. Ashwathi Nair

BE E&TC, 2018 Batch

Alumini

Farewell for Batch 2022

"May the road rise up to meet you. May the wind be even at your back. May the sun shine warm upon your face and the rain fall softly on your fields. And until we meet again, may God hold you in the hollow of his hand" open doors to some very exciting entrepreneurial advancements.

The workshop of VPKBIET was echoed with the blessings on the evening of 6th June 2022 when department family came together to bid farewell to the outgoing 2022 batch of final year students. It was the evening of mixed emotions for all present at the auditorium to witness the official send-off for the batch 2022.

During the farewell ceremony, the final year students expressed their feelings about their college, their teachers and the experience they have had over the last four years. The principal of the college, Dr. R. S. Bichkar, Head of E & TC Department Dr. Balasaheb Patil, Class Teacher Mr. Shashank Biradar ,Mr. Rohit Piske and teachers from the department graced the occasion.

Farewell for Batch 2022

Glimpse of Event:

Blessings!!

"Our wish for your batch is that this life becomes all that you want it to. You all have been friends together in sunshine and in shade"

If you're brave enough to say goodbye life will reward you with a new hello

Editor's Desk

Dear Readers,

Greetings from Team E & TC Engineering,

Hope you and your family are safe. **"Tell me and I forget. Teach me and I remember. Involve me and I learn.",** Benjamin Franklin.

The Creative minds of the Electronics and Communication department of VPKBIET have come together to present what they have always wanted to and we congratulate every student and faculty who has given their contribution. We take pride in showing you of how our very own VPKBIET's have imaginations which spread across the horizons. We would like to thank the Management and all the staffs who have supported the **'ELECTRONICA'** initiative and for having trust in the Editorial board by giving us full freedom to choose the contents and design for out magazine. The magazine should serve as a pillar of motivation for every other student who is yet to emerge as an Achiever and to carry the legacy of 'Electronica'

Thanks for your time!!

Let us know, what you think, your

suggestions are highly appreciated!!!

You can contact us at:

monali.more@vpkbiet.org

EDITORIAL TEAM

Faculty:

Dr. B.H.Patil (HoD)

Mrs. More Monali U. (Editor)