



Bapuji Educational Association (R.)

Bapuji Institute of Engineering & Technology
Davangere - 577004

(AFFILIATED TO VTU BELAGAVI, APPROVED BY AICTE, NEW DELHI)
ACCREDITED BY THE NAAC WITH 'A' GRADE



Department of Computer Science & Engineering

UniCS



THE TECH MESSENGER

News Letter - Volume of the Year

JANUARY 2022 - JUNE 2022

"THE BEAUTIFUL THING ABOUT LEARNING IS THAT NO ONE CAN TAKE IT AWAY FROM YOU."

- B. B. KING

Vision of the Institute

"To be a centre of excellence recognized nationally and internationally, in distinctive areas of engineering education and research, based on a culture of innovation and invention"

Mission of the Institute

"BIET contributes to the growth and development of its students by imparting a broad based engineering education and empowering them to be successful in their chosen field by inculcating in them positive approach, leadership qualities and ethical values "

Vision of the Department

"To be a center-of-excellence by imbibing state-of-the-art technology in the field of Computer Science and Engineering, thereby enabling students to excel professionally and be ethical".

Mission of the Department

- M1: Adapting best teaching and learning techniques that cultivates Questioning and Reasoning culture among the students.
- M2: Creating collaborative learning environment that ignites the critical thinking in students and leading to the innovation.
- M3: Establishing Industry Institute relationship to bridge the skill gap and make them industry ready and relevant.
- M4: Mentoring students to be socially responsible by inculcating ethical and moral values.

Program Educational Objectives (PEOs)

- PEO1 - To apply skills acquired in the discipline of Computer Science and Engineering for solving societal and industrial problems with apt technology intervention.
- PEO2 - To continue their career in industry/academia or to pursue higher studies and research.
- PEO3 - To become successful entrepreneurs, innovators to design and develop software products and services that meets the societal, technical and business challenges.
- PEO4 - To work in the diversified environment by acquiring leadership qualities with effective communication skills accompanied by professional and ethical values.

Program Specific Outcomes (PSOs)

- PSO1 - Analyze and develop solutions for problems that are complex in nature by applying the knowledge acquired from the core subjects of this program.
- PSO2 - Ability to develop Secure, Scalable, Resilient and distributed applications for industry and societal requirements.
- PSO3 - Ability to learn and apply the concepts and construct of emerging technologies like Artificial Intelligence, Machine learning, Deep learning, Big Data Analytics, IoT, Cloud Computing, etc for any real time problems.

Newsletter Objectives

- To showcase the achievements of the Students and Faculty members from the CS & E department in Curricular, Co-curricular and Extra-curricular Activities.
- To get the awareness on recent trends in the area of Computer Science & Engineering and related areas.

About the Department

Department of Computer Science and Engineering was established in **1984** as an academic centre for undergraduate studies in Computer Science and Engineering and currently offers undergraduate program with the intake of 180. Visvesvaraya Technological University recognized the R and D centre in the year 2000. There are 7 research supervisors and total of 13 scholars have been awarded with PhD degree under Kuvempu and VTU. 17 scholars are pursuing their PhD as on today. Very proud to say that, undergraduate program has been accredited three times by **NBA**. It is supported by well qualified faculty, non - teaching staff and best - in - class Infrastructure in imparting the quality technical education in the field of Computer Science and Engineering. The department strives hard to prepare the students to be industry ready along with motivating them towards higher studies as well as entrepreneurship mindset. It is the best opted department in central part of Karnataka and is well known for its university results, placements, industry and Alumni tie ups. Department is regular in hosting International and National Conferences, faculty development programs, Workshops, Learnathon, Hackathon and many more events for the benefit of students and faculty members.

The Department of Computer Science and Engineering of BIET has been at the forefront of churning out software engineers with a high caliber of technical expertise. It continues to foster and engender the innovation and breadth of vision necessary to excel in the blooming software industry.

From the Editorial...

Greetings to all!

The department is cheerful to present the latest edition of the Department of CSE Newsletter. It motivates, enlightens and enables the Student & Staff community to focus on their goals and achieve more. This newsletter explores the hidden talents, commitment, involvement and achievements of the Department Students and Staff Community in their Extra and Co Curricular activities to the world.

The yearly newsletter of the Department of CSE covers the information about the Faculty Development Programme, faculty participation, student activities.

We look forward to your continued contribution and participation in this Newsletter. Your good ideas, comments or valuable suggestion about this Newsletter are welcome. This may lead to enhance the quality and professionalism of this newsletter in forth coming editions. Thank you for choosing and spending time with this newsletter.

We hope, this Newsletter encourage you to conquer more in your field.

sd/-
Editorial



Message from HOD's Desk

I feel happy to say that, Department of Computer Science & Engineering is releasing its Annual Newsletter “Tech Messenger” for the year 2022.

Department is instrumental in “Strong Alumni and Industry Connect” through which, achieving its goal of making students industry ready and employable by conducting Hackathons, Coding challenges, Real time project development contests and entrepreneur awareness activities. Faculty members of the department are highly encouraged to carry out their research work by providing conducive environment. Department forum “UniCS” is a platform to bring out the hidden talents of students. Department regularly organizes Technical Talks, alumni interactive sessions, workshops, Hackathons for students and FDPs for faculties in association with industries and Alumni. This newsletter showcases the glimpses of the activities held in the department. I congratulate editors of the Newsletter for their effort in bringing out this Newsletter in an attractive manner with all the events covering from January 2022 to June 2022. I wish them all the best.

Dr.Nirmala C.R.
Prof. & Head
Dept. of CSE

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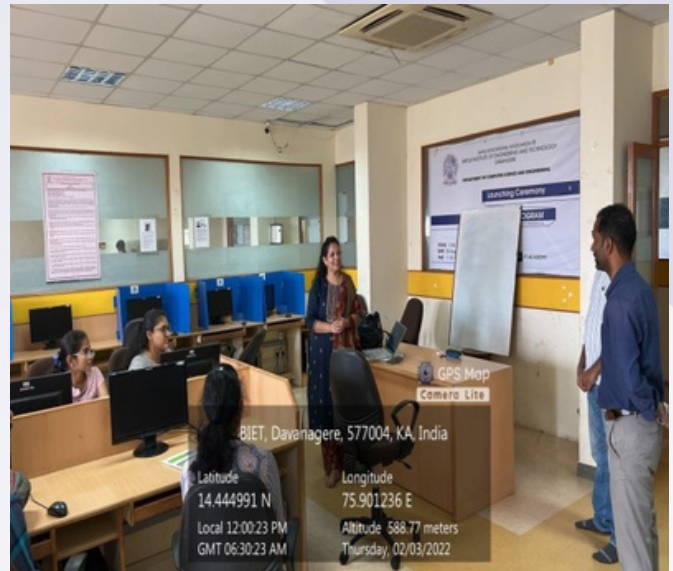
Mr. Dinesh Narayanan S

FDP/WORKSHOP ATTENDED

- Dr. Pradeep N has Participated in interactive session on Smart India Hackathon 2022 conducted by SIH organizers on 11/01/2022 and 25/02/2022
- Prof. Abdul Razak M S has attended 5 days online FDP on "Web Development Using Django" from 31st jan to 4th feb 2022 conducted by PESIT Shivamogga.
- Dr. Chethana Prakash and Dr. Roopa G M have attended One Week Research Development Program on " Problem Formulation, Publication, Proposal and Thesis Writing" from 07/02/2022 To 12/02/2022 organized by Alvas Institute of Engineering and Technology, Moodbidri in association with IITA and CSI.
- Prof. Anu C S and Prof. Preethi B have attended 5 days online workshop on Data Analysis Using Statistical Learning Techniques organized by IIT Madras from 21/02/2022 to 26/03/2022.
- Prof. Santosh K C, Dr. Gururaj T, Dr. Ashoka K , Dr. Naveen K R, Prof. Gangadharappa S, Prof. Gangamma H attended AICTE sponsored UHV FDP on "Incorporating Universal Human Values in education" from 09/05/2022 to 13/05/2022.
- Prof. Jagadeesh A N has attended one week online workshop on “Vedic Mathematics and its applications” organized by Annant Gyan from 9/5/2022 to 14/5/2022.
- Dr. Gururaj T has attended 5 Days Online FDP on “Deep learning towards Engineering and Bio-medical Applications” held from 16th to 20th May 2022 organized by department of CSE, Mepco Schlenk Engineering college (Autonomus).
- Prof. Shilpa K C has attended 5-Day Faculty Development Program (FDP) on “Data Analysis with SPSS” held from 1st - 8th June 2022, organised by CMS Business School, Jain (Deemed-to-be University) in association with Institute of Analytics (IoA), London.
- Dr. Arun Kumar G Hiremath has attended Pre-conference tutorial at the seventh international conference on "Emerging Inforfomation, Communication and Applications" ERCIC by NITTE Meenakshi Institute of Technology (SCOPUS, SPRINGER).

TRAINING PROGRAM

- The Training Program was conducted to students placed in “Skyscend India Private Limited” on 03rd February 2022.



Interaction with students during Training Program

EVENTS ORGANIZED in Department

- Department Conducted event “Compliance of Scheme and Syllabus for all CSE/ISE: NEP-2021” in association with IQAC Cell, BIET was held on 28th January 2022 by the Resource person Dr. Shreedhar K S, Profesoor, CS&E, UBDTCE, Davangere.



Inauguration of the event by the Resource Person

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- CS&E Dept. and Training and Placement cell has organized MoU Exchange Program with “**Fresher Profile – Placement Assistance Portal**” on 10/02/2022.



Dr. Manvendra, Dr. Devendrappa, Mr. Shivaprasad K, Santosh Navale, Fresher profiles, Bangalore, Dr. Aravind H B, Prof. Y. Vrushabhendarappa, Dr. Nirmla C R and all placement coordinators

- Department of Computer Science and Engineering is involved in signing 5 years of Membership with “**ICT Academy Bangalore**” on 17/02/2022. The department is responsible for executing all the activities of ICT Academy.



D Vishnu Prasad, State head- Karnataka at ICT Academy, during ICT Academy Associate Membership Certificate Exchange

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- Department of Computer Science and Engineering Conducted “**CODE-O-FIESTA**” for 1st year students on 23/02/2022.



Inauguration of CODE-O-FIESTA

- In connection with International Women’s Day 2022, Department of CS&E conducted “**Ikebana: Flower arrangement Competition**” for girls and lady faculty members on 14/03/2022.



Faculties participating during the Competition

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- The inauguration of “**Internal Hackathon for SIH 2022**” function was held on 23-03-2022. Rakesh L, Director Ada Lovelace Software Pvt. Ltd., Shreyas S Vernekar, Co-Founder and CEO of Rove Labs Pvt. Ltd. and Sunil K V, DGM-IT, Davangere Smart City Limited are the Jury members for Evaluation.



Glimpses of the Event

- Dr. Roopa G M, Dr. Gururaj T and Prof. Shwetha G delivered the topic on “**Virtual and Augmented Reality changing Horizons in dentistry**” in Dental College of Science for Knowledge enhancement Program on 05th April 2022.



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- **“FRISSION 2022”** Branch Fest activities were conducted under the Banner of UniCS on 10th and 11th June 2022.



Inauguration of FRISSION-2022



Glimpses of Tug of war, Dog and the Bone on 11th June 2022

PROJECTS SANCTIONED BY KSCST/ Or any other notable student projects

- Student project titled “Detection of concept drift in telecommunication stream data” guided by Prof. Abdul Razak M S was approved and funded by KSCST, 45th Series of Student Project Programme.
- Student project titled “Analysis and Identification of Gastrointestinal Diseases using Deep Learning Approaches” guided by Dr. Pradeep N and Prof. Arjun H was approved and funded by KSCST, 45th Series of Student Project Programme.
- Student project titled “Cotton Leaf Disease Detection using Deep Learning” guided by Prof. Naveen H M was approved and funded by KSCST, 45th Series of Student Project Programme.
- Student project titled “LoRa based framework for smart greenhouse monitoring system” guided by Dr. Roopa G M and Prof. Vaishnavi A I was approved and funded by KSCST, 45th Series of Student Project Programme.
- Student project titled “Deep learning Algorithms for Analysis and Prediction of Cardiovascular Disease” guided by Dr. Pradeep N and Prof. Arjun H was approved and funded by KSCST, 45th Series of Student Project Programme.
- Student project titled “Smart Solid Waste Management with IoT and Machine Learning” guided by Dr. Nirmala C R and Prof. Rachana G S was approved and funded by VTU.
- Student project titled “Krushi Mitra” guided by Prof. Preethi B was approved and funded by VTU.
- Student project titled “Underwater Image Enhancement Via Medium Transmission Guided Multi Color Space Embedding” guided by Prof. Gangadharappa S was selected for funding under Institute sponsored project
- Student project titled “Wheeled Robot for Isolation Ward” guided by Prof. S.B. Mallikarjuna and Prof. Shryavani K was selected for funding under Institute sponsored project.

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STUDENTS ACTIVITIES/Programs organized

- Dept. of CS&E Conducted Technical quiz “TCS Techbytes” on 19th Feb 2022.



- “Progyan 4.0” In-House Project Exhibition of Final Year Students was held on 20th and 21st of April 2022, three batches were selected for Best Projects of the year 2021-22 out of 37 Batches.



Project Evaluators are Sandeep S H -Alumini 2010, Senior Tech Lead, Sachin S Alumni 2015, Managing Director, Prowork Code India Pvt. Ltd.

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- Department of Computer Science and Engineering organized “Crash Course on C++” from 23rd May 2022 to 27th May 2022 for 4th semester students.



Glimpses of Crash Course

- “39th Graduation Day and Award Ceremony” in the honor of Class of 2021 and Top Scoring Students was conducted on 7th May 2022.



Glimpses of Graduation Day-2021

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- “Farewell Party & Alumni Meet” for the batch of 2016-2020 was held on 28th May 2022.



Glimpses of the Event

- Writing is the new luxury “LaTeX” Workshop for 6th and 4th Semester students was conducted on 07/06/2022. Mr. Sohan Jain, 6th Semester was the resource person for the workshop.



Students participation in the Workshop

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- **AICTE** activity point report Evaluation of 2018-22 batches held on 29/06/2022.



Evaluation of report by Dr. Krishna Kumar T K, NSS Coordinator.

- Alumni Mr. Channa Bankapur visited CS&E department on 30/06/2022 and addressed 4th semester Students for placement preparation.



PAPER PRESENTED /PUBLISHED by faculty

- Dr. Nirmala C. R, published a paper “Hybrid time centric recommendation model for e-commerce applications using behavioral traits of user”, Inf Technol Manag (2022) in Springer link.
- Santosh K C and Pradeep N. “Machine Learning Techniques for Human Age and Gender Identification Based on Teeth X-Ray Images”, Hindawi, Q2 Journal of Healthcare Engineering.
- Prof. Abdul Razak M. S., Dr. Nirmala C. R, Prof. Maha Aljohani and Dr. B. R. Sreenivasa published a paper “A novel technique for detecting sudden concept drift in healthcare data using multi-linear artificial intelligence techniques”, Frontiers in Artificial Intelligence.
- Abdul Razak M.S, Dr. Nirmala C R, Chetan B B, Dr.Mohammed Rafi, Dr. Sreenivasa B R published a paper “Online Feature Selection using Pearson Correlation Technique”, 7th IEEE international conference on "Recent Advances and Innovations in Engineering", at NITK Surathkal.
- Dr. Naveen Kumar K R published a paper “IOT Based Road Safety System”, International Journal of Innovative Research in Computer and Communication Engineering.
- Dr Nirmala CR, Dr Gururaj. T, Dr Naveen K R published a paper “Monitoring activity and detecting unexpected events in surveillance footage using Deep CNN”, International journal of Advances in Computer Science and Technology(IJACST)

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PLACEMENT DETAILS

Sl. No	Name of the Employer	No of Students Placed
1	Wipro Elite	27
2	KPMG	24
3	Inspirage	20
4	TCS NINJA	17
5	Infosys	11
6	SLK Software	7
7	Quest Global	6
8	FAI	6
9	Zensar	6
10	Silver Peak	5
11	Skyscend	5
12	E&Y	4
13	IBM	1
14	Alt Digital	1
15	WorkForce Software	2

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Sl. No	Name of the Employer	No of Students Placed
16	Herin Electronics	3
17	Inube	3
18	MAPLE LABS	2
19	Altimetrik	1
20	Rakuten	1
21	Mindtree	1
22	Capgemini	1
23	Cognizant	1
24	Birlasoft	1
25	Sonata	1
26	Wiley Mthree	1
27	Cloudifyops	1
28	IBM	1
29	Cleo Software	1
30	Knodtec	1
Total Placed		162

UNIVERSITY WORK carried by Faculty

- Dr. Nirmala C R has appointed as examiner for Ph.D. viva voce and UG practical examination.
- Dr. Chetana Prakash has appointed as examiner for UG practical examination and M.Tech project work viva voce.
- Dr. Pradeep N has appointed as examiner for Ph.D. viva voce and M.Tech project work viva voce.
- Dr. Ashoka K has appointed as Board of Examiner for B.E Examination.
- Prof. Raghu B.R, Prof. Naresh Patel K M, Prof. Naveen H M, Prof. Naveen K R, Prof. Gangadharappa S appointed as valuator for UG answer scripts and examiner for UG practical examination.
- Prof. Waseem Khan, Prof. A N Jagadish, Prof. Preethi B, Prof. Gangamma Hediylad, Prof. Anu C S appointed as examiner for UG practical examination and UG answer scripts.

Ph.D. Awarded

- Prof. Naveen Kumar K R awarded Ph.D. for the thesis titled “Optimized Data Mining Techniques for Zone Delineation and Yield Prediction for Precision Agriculture” under the guidance of Dr. Nirmala C R on March 10, 2022.
- Prof. Arun Kumar G H awarded Ph.D. for the thesis titled “Optimized Data Mining and Machine Learning Techniques for Spatial Outlier Detection and Removal in Precision Agriculture” under the guidance of Dr. Nirmala C R on March 10, 2022.

Article



Dr. Naveen Kumar K R

Assistant Professor

Dept. of CS&E

Software Design Pattern

In software engineering, a software design pattern is a general, reusable solution to a commonly occurring problem within a given context in software design. It is not a finished design that can be transformed directly into source or machine code. Rather, it is a description or template for how to solve a problem that can be used in many different situations. Design patterns are formalized best practices that the programmer can use to solve common problems when designing an application or system.

Object-oriented design patterns typically show relationships and interactions between classes or objects, without specifying the final application classes or objects that are involved. Patterns that imply mutable state may be unsuited for functional programming languages. Some patterns can be rendered unnecessary in languages that have built-in support for solving the problem they are trying to solve, and object-oriented patterns are not necessarily suitable for non-object-oriented languages. Design patterns may be viewed as a structured approach to computer programming intermediate between the levels of a programming paradigm and a concrete algorithm.

Practice

Design patterns can speed up the development process by providing tested, proven development paradigms. Effective software design requires considering issues that may not become visible until later in the implementation. Freshly written code can often have hidden subtle issues that take time to be detected, issues that sometimes can cause major problems down the road. Reusing design patterns helps to prevent such subtle issues, and it also improves code readability for coders and architects who are familiar with the patterns. In order to achieve flexibility, design patterns usually introduce additional levels of indirection, which in some cases may complicate the resulting designs and hurt application performance.

By definition, a pattern must be programmed anew into each application that uses it. Since some authors see this as a step backward from software reuse as provided by components, researchers have worked to turn patterns into components. Meyer and Arnout were able to provide full or partial componentization of two-thirds of the patterns they attempted. Software design techniques are difficult to apply to a broader range of problems. Design patterns provide general solutions, documented in a format that does not require specifics tied to a particular problem.

Structure

Design patterns are composed of several sections. Of particular interest are the Structure, Participants, and Collaboration sections. These sections describe a design motif: a prototypical micro-architecture that developers copy and adapt to their particular designs to solve the recurrent problem described by the design pattern. A micro-architecture is a set of program constituents (e.g., classes, methods...) and their relationships. Developers use the design pattern by introducing in their designs this prototypical micro-architecture, which means that micro-architectures in their designs will have structure and organization similar to the chosen design motif.

Classification and list

Design patterns had originally been categorized into 3 sub-classifications based on what kind of problem they solve. Creational patterns provide the capability to create objects based on a required criterion and in a controlled way. Structural patterns are about organizing different classes and objects to form larger structures and provide new functionality. Finally, behavioral patterns are about identifying common communication patterns between objects and realizing these patterns.

Creational patterns

Name	Description
Abstract factory	Provide an interface for creating families of related or dependent objects without specifying their concrete classes.
Builder	Separate the construction of a complex object from its representation, allowing the same construction process to create various representations.
Dependency Injection	A class accepts the objects it requires from an injector instead of creating the objects directly.
Factory method	Define an interface for creating a single object, but let subclasses decide which class to instantiate. Factory Method lets a class defer instantiation to subclasses.
Singleton	Ensure a class has only one instance, and provide a global point of access to it.

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Structural patterns

Name	Description
Adapter, Wrapper, or Translator	Convert the interface of a class into another interface clients expect. An adapter lets classes work together that could not otherwise because of incompatible interfaces. The enterprise integration pattern equivalent is the translator.
Bridge	Decouple an abstraction from its implementation allowing the two to vary independently.
Composite	Compose objects into tree structures to represent part-whole hierarchies. Composite lets clients treat individual objects and compositions of objects uniformly.
Decorator	Attach additional responsibilities to an object dynamically keeping the same interface. Decorators provide a flexible alternative to subclassing for extending functionality.

Behavioral patterns

Name	Description
Blackboard	Artificial intelligence pattern for combining disparate sources of data
Chain of responsibility	Avoid coupling the sender of a request to its receiver by giving more than one object a chance to handle the request. Chain the receiving objects and pass the request along the chain until an object handles it.
Iterator	Provide a way to access the elements of an aggregate object sequentially without exposing its underlying representation.
Observer or Publish/subscribe	Define a one-to-many dependency between objects where a state change in one object results in all its dependents being notified and updated automatically.
Strategy	Define a family of algorithms, encapsulate each one, and make them interchangeable. Strategy lets the algorithm vary independently from clients that use it.