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Dept of Computer Science and Engineering

Message from the Head of the Department

I am happy to present this edition of our departmental newsletter. The content for this newsletter is the result of effort put by our students and faculty during this pandemic time. Even though it is a lot of effort in gathering data on what information is worth reporting every six months, the reactions from our colleagues, alumni and students have made it worthwhile.

Our faculty and students have been working hard in research, bringing new research grants, new research thrusts and reaching innovative research in teaching by creating new courses and enormous effort has been put in adopting the digital transformation. The creation of newsletter every six months gives us an opportunity to take a stock on how we are progressing towards achieving excellence in diverse domains of Computer Science and Engineering. Striving for continued progress and betterment of our research, consultancy, education and service to community are very important to us. Our constant collaboration with various industry leaders has furthered our ability in research and development.

Few of our faculties are awarded by industry for their excellent research works as papers publications and completion of consultancy projects.

Our students are actively participating in virtual conferences, coding competitions and events conducted during this pandemic and have been achievers. Many of our faculty members worked over past six months to formulate certain changes in curriculum – both undergraduate and postgraduate levels. A lot more is in this newsletter – which I cannot fit in the next 6 months, and beyond.

-Dr Ramakanth Kumar P

Vision

To achieve leadership in the field of Computer Science & Engineering by strengthening fundamentals and facilitating interdisciplinary sustainable research to meet the ever growing needs of the society.

Mission

- To evolve continually as a centre of excellence in quality education in computers and allied fields.
- To develop state-of-the-art infrastructure and create environment capable for interdisciplinary research and skill enhancement.
- To collaborate with industries and institutions at national and international levels to enhance research in emerging areas.
- To develop professionals having social concern to become leaders in top-notch industries and/or become entrepreneurs with good ethics.

Events hosted by our Department

Webinar on Application of Computers in design automation for handlooms and power looms in textiles

A webinar on "Application of Computers in design automation for handlooms and power looms in textiles" was organized on 27 June, 2020. The talk was delivered by Dr. Badrinath K, Assistant Professor, CSE Department, RVCE, Bengaluru. Once upon a time, computers did not have anything to do with textile production, especially handlooms. With increase in demand for textiles, use of computers in textile production has reduced time and effort taken to produce fabric and increased production. Technological developments have helped qualitative and quantitative changes in textiles. Computers are used for their speed, power and versatility. They facilitate quick computations and precise solutions, saving time. A set of instructions and procedures address the task to be performed, speeding up production and avoiding slower manual work. Based on this, many technological aspects and details about Computer Aided Design and Computer Aided Manufacturing were discussed providing insights into how computers have eased the process and enhanced automation in textile industry.

Webinar on Improving efficiency of Machine Learning Algorithms using HPCC system platforms

A webinar on improving efficiency of Machine Learning Algorithms using HPCC system platforms was organized on 25 June, 2020. The session was delivered by Dr. Shobha G, Professor, CSE department, RVCE, Bengaluru. ML is undoubtedly one of the most exciting technologies that one would have ever come across which gives computers the capability to learn by providing computer algorithms and allow them to improve automatically through experience. An algorithm makes the system adapt to a specific input-output transformation task. There are a wide range of machine learning algorithms developed on the High Performance Cluster Computing (HPCC) platform. This platform includes traditional algorithms such as Naïve Bayes and K-Nearest Neighbors, to more advanced techniques such as Deep Learning. This enables researchers and practitioners to apply machine learning algorithms on big data to extract patterns and perform predictive tasks. It provides a platform for implementing parallel, distributed and scalable machine learning algorithms. The general linear algebra and statistical operations implemented in HPCC along with the data structures provide an ideal platform for implementing the machine learning algorithms. Many aspects on this line, improving the efficiency of these ML algorithms using HPCC platform were discussed.

Webinar on Natural Language Processing and its applications

A webinar on Natural Language processing and its applications was organized by IEEE RVCE, Computer Society. The session was delivered by Mr. Rithesh Sreenivasan, Research Scientist, Philips India Limited. Natural Language Processing (NLP) is an emerging technology which is also among the hottest topics in the field of data science. There is a huge demand to pursue it as career. In a few years time span, natural language processing has evolved into something very powerful and impactful in present world. This session brought a focus on what NLP is, some existing NLP models, many applications making use of NLP and how it has made data analysis easier. The applications included the usage of NLP in building chat bots, search autocorrect and autocomplete in browsers, survey analysis, targeted advertising, grammar checks, voice assistants, social media monitoring, language translation etc. Large number of enthusiastic students took part in this webinar which provided them with lot of knowledge and helped them develop interest in Natural Language Processing.

Webinar on Bio-Informatics: An inherent lifeline for Biology

The IEEE RVCE, Computer Society of RVCE, Bengaluru organised a webinar on Bio-Informatics as an inherent lifeline for biology. The session was delivered by Dr. Vidya Niranjan, Professor and Head, Department of Biotechnology, RVCE, Bengaluru. Bioinformatics is an interdisciplinary field that develops and improves on methods for storing, retrieving, organizing and analyzing biological data by making use of computer programming. A major activity in bioinformatics is to develop software tools to generate useful biological knowledge. Bioinformatics has become an important part of many areas of biology. In experimental molecular biology, bioinformatics techniques such as image and signal processing allow extraction of useful results from large amounts of raw data. In the field of genetics and genomics, it aids in sequencing and annotating genomes and their observed mutations. The concepts of this interdisciplinary topics along with their applications were discussed with students.

Research Projects

Design and Development of Machine Learning based Information Retrieval Chatbot

The research project titled **Design and development of Machine Learning based information retrieval chatbot** was being implemented by Dr. Shobha G, Professor, CSE department and Dr. Poonam G, Associate Professor, CSE department during the year 2020-21 with the funding agency being System Consultant Information India Pvt Ltd (SCII). The project included understanding requirements, exploring different technologies for the chatbot design, input processing, NLP, NLU (Intent Recognition), designing appropriate model and initial training, analysis of trained model and optimization, retraining plan and GUI, testing, deployment and documentation.

Data Logging System for FTTA (Fiber To The Antenna) Cable Assembly

The research project titled **Data Logging System for FTTA (Fiber To The Antenna) Cable Assembly** was being implemented by Dr. Ramakanth Kumar P, Professor and Head, CSE department and team during the year 2020-21 with the funding agency TE Connectivity India Private Limited. The objectives of the project included design of dashboard to give update on real-time basis, display of first pass yield, monitoring the efficiency of the operators, depicting status of each process being completed and status to be recorded on daily basis and collated.

Adaptive Density Based Clustering

The research project titled **Adaptive Density Based Clustering** sought to implement adaptive density based clustering algorithms, in distributed fashion, on HPCC systems.

The team included Srishti Moorthy, II year student, CSE department and Varsha R Jenni, II year student, CSE department under the mentorship of Dr. Shobha G, Professor, CSE department and Prof. Jyoti Shetty, Assistant Professor, CSE department.

An adaptive density based clustering algorithm, which can identify clusters efficiently in datasets with variable density was implemented on the HPCC systems, assessing the performance of adaptive DBSCAN in comparison to the performance of K-means, DBSCAN and other chosen algorithms, against various datasets with heterogenous clustering needs and complete support documents were implemented by the team.

Testing GANs using the Generalized Neural Network ECL bundle and producing annotated code to add to the existing GNN bundle

The research project titled **Testing GANs using the Generalized Neural Network ECL bundle and producing annotated code to add to the existing GNN bundle** sought to identify appropriate datasets for testing GANs and implement the same using ECL, in order to be integrated with GNN bundle.

The team included Rohit Sachin Sadavarte,, II year student, CSE department and Ambu Karthik, II year student, CSE department under the mentorship of Dr. Shobha G, Professor, CSE department and Prof. Jyoti Shetty, Assistant Professor, CSE department.

The deliverables included identification of appropriate dataset for testing GNN, implementing various configurations for GAL using ECL, performance testing of different configurations and producing complete documentation for all the above.

HPCC Analytics Query Language (HAQL)

The research project titled **HPCC Analytics Query Language (HAQL)** sought to implement AQL for HPCC and also appropriate means of running it via translation to ECL.

The team included Atreya Bain, II year student, CSE department and Anurag Singh Bhadauria, II year student, CSE department under the mentorship of Dr. Shobha G, Professor, CSE department and Prof. Jyoti Shetty, Assistant Professor, CSE department.

Identification of layout of the grammar and structure of HAQL. Followed by the implementation of the language constructs, such that it will be parsed, and translated to ECL language to be executed. Evaluation of various aspects of the implementation such as the performance and runtime of the implementation, comparison with the native results and preparation of supporting document.

Research and Publications

Patent Publications-

- RVCE patent application for invention titled "*Method, System and Apparatus for preventing shoulder surfing in secure electronic transactions*"

invented by Dr. Shobha G, Dr. Azra Nasreen and Poornanand Purushotham Naik was published in the official journal of the Indian Patent Office (IPO) on 10 July 2020.

- An RVCE patent application was published on 3 April 2020.

The inventors were Prof. Sneha M, Dr. Shobha G, Shakthi Kumar and Rahul MV

Awards received by Faculty

- Dr. Soumya A, Dr. Shanta Rangaswamy, Dr. Pratiba D and Prof. Ganashree KC received appreciation certificate for completion of Samsung Prism project.

Student Activities

Our department's pride lies in its multi-talented students. They are a part of various activities apart from academics such as cultural and technical clubs. Poplar clubs include CARV (for Theatre arts), Alaap (for musicians), Footprints (for dance lovers), etc. These clubs are active all-round the year and are quite popular amongst other Engineering colleges. The department encourages and provides total support to the students for their all-round development. A lot of students are active members of these clubs and have as well won name and fame while competing against various colleges across the nation.

Students interested in various interdisciplinary areas are encouraged to join some of the innovative technical clubs. From college level to International level, the students of our department have brought laurels to the institution. The college and the department supports them with technical as well as financial aids. Dedicated mentors for each of the clubs help in catering to the needs of the team. These clubs include Ashwa Racing, Team Chimera, Project Jatayu, Team Helios and others. These clubs conceive and develop everything from racing cars to mini satellites. Our students have been an integral part of these clubs since their conception.

Our Students are also part of various other activities organised by other clubs such as Rotaract and NSS and actively participate in activities including Blood donation camps, Paper drives, Akshara, etc.

Student Achievements

Besides academics, our department is widely known for its multi-talented students. We see a large number of students from the department represent college at collegiate, national and international Levels in different domains. The department gives its complete support and encouragement to all its students to participate in these activities. The students of our department have continued to make best use of opportunities even amidst the pandemic.

Here are a few achievements by the students.

- **Corono HINT android application**
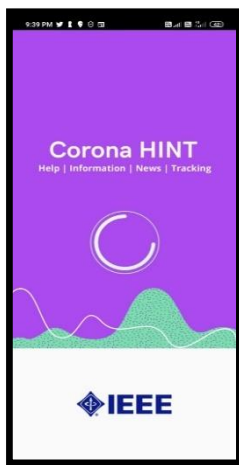
The android application named "Corono HINT" was accepted by IEEE Bangalore Chapter after few revisions. Dr. Ramakanth Kumar P, Head, CSE Department, RVCE had deployed the application and Abishek from coding club of RVCE worked on android conversion.

The app allows the users to create a profile by entering the required information and provides them with the data of number of active cases, the statistics of number of COVID 19 confirmed cases, recovered cases and deaths in the country and state. It provides an option to add reminder for various activities the user would like to remember. It can be, to wash their hands and sanitise at regular intervals, workout everyday etc. The details about the nearest available medical services and drug stores are also shown to the user.

- **e-Cocoon App**

Mobile application which was developed and now being maintained for Central Silk Board usage, has appeared in the 'INDIA - Year Book 2020, Current affairs/General Awareness' by R.P.Meena.

This is a book for UPSC, PSC and other competitive exams, published every year by the Ministry of Information and Broadcasting. India year book contains information about India, its various Ministries and departments with their schemes and policies.

"Ministry of textiles has launched a mobile application for quality certification in silkworm seed sector. The app will be used by the seed analysts and seed officers nominated under Central Seed Act for system and product certification through real time reporting" was published in the book.

- **Microsoft Codefundo**

Microsoft Codefundo is an annual competition conducted by Microsoft to imbibe innovation among engineering students. Every year there is a theme which revolves around challenging problems. This year the theme was "Secure Electronic Voting using Azure Blockchain". 21 premier engineering institutes of the country compete to come up with a solution.

The trio Lakshmi V Narke, Chidroop I and B Dhanush from our department have secured the first place at the national finals for their solution Secure Suffrage. These 4th year students have devised a novel solution to make the election process transparent and secure. A blockchain is a decentralized, distributed and often times public, digital ledger that is used to record transactions across many computers so that any involved record cannot be altered retroactively, without alteration of all subsequent blocks. So it can lay the foundation to build secure and trustable platforms. Secure Suffrage believes that a good democracy needs a strong foundation laid in integrity, trust, transparency and security. The voter can vote from any booth. Officials can be identified using Microsoft Cognitive services to verify face details. It aims to create a platform where we can establish a two-way channel between the citizens and their representatives where major policies or complaints can be raised and the constituency members can vote on it.

- **Code for Good Hackathon 2020 from JP Morgan Chase & Co.**

Sanjana Reddy of CSE department along with Hasifa A S of ISE department and four others have won the JPMorgan Chase & Co.'s Code for Good hackathon. The hackathon ran over the span of 12 hours requiring to develop a solution for Yuva Parivartan, a non-profit organisation. The solution that the team came up with, was a web application that allows consolidation of data to generate the visual summary for a specific user defined time frame and an exportable report for role based authorized users.

- **HPCC Systems**
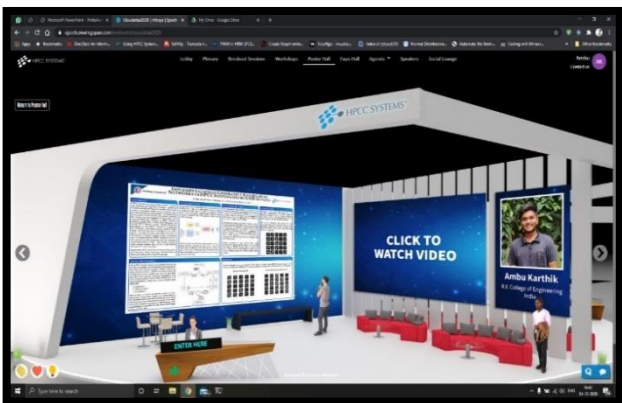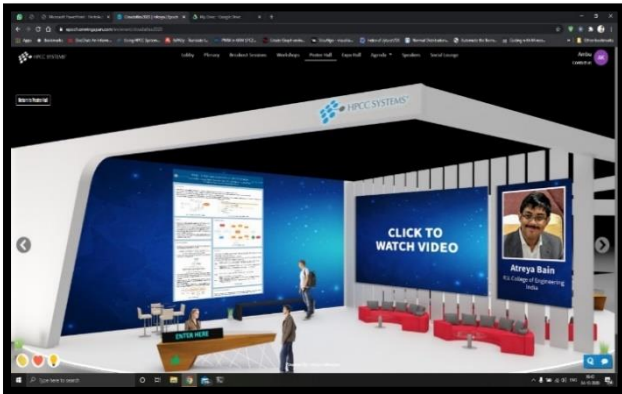
Virtual conference at Atlanta with Varsha Jenni, Ambu Karthik and Atreya Bain, students from V semester, CSE Department. Dr.Shobha G, Professor, CSE Department, RVCE has supported these students throughout the process.

- **Walmart SparkPlug 2020**

Lakshmi V Narke and Chidroop I (Team Coconut Tree) from RVCE have secured the runners up position for their AR based navigation application "North Star" in Walmart spark plugs. Walmart spark plugs was a national level hackathon conducted by Walmart Labs which received about 4000 registrations and had five problem statements to solve.

- **Pratik Mohapatra**, an Alumni of Computer Science and Engineering Department who is a product manager at Microsoft Teams was invited for the TiE Bangalore chapter to speak about counterfeit medicines. He spoke in length about how the industry can improve and make processes and technology better to detect counterfeit medicines.

- **Pratik Mohapatra** was invited to Cisco on 17 June 2020 to give a talk on product management. He spoke about how he got into Microsoft and his experience there. He also spoke about a case study in finance and stock brokerages and how that could be applied to product management.

- **First rank gold medalists in Computer Science and Engineering Department**

Tanmay Sanjay Hukkeri, final year B.E student of our department was awarded the gold medal for securing first rank in B.E in Computer Science and Engineering.
Pramod K was awarded the gold medal for securing first rank in M.Tech in Computer Science and Engineering and Pallavi Deshwal was awarded the gold medal for securing first rank in M.Tech in Computer Network Engineering.

- **Sudarshini Tyagi**, Alumnus of CSE department, RVCE has been successfully graduated from New York University.

Student Placement Offers

Our deartment has continuously proved to be one of the best in terms of in-campus student placements every year. The details regarding the same are given below.

A total of 86 offers have been extended till date in RVCE.

Atlassian has extended an offer to a CSE student with 54 lakh per annum CTC which is one of the highest CTC offered in the department.

We have received nine offers at 40 lakh and above per annum, eight offers at 35 lakh and above per annum and all others of 20 lakh and above per annum.

Some of the offers received during Jan 2020 to Aug 2020 are as followed –

Manish M Naik, IV year student, has been recruited by Paypal company with a CTC of 21 lakh per annum.

Pruthviraj Murankar, IV year student and Sudhanva Digambar Patil, IV year student have been recruited by Groww company by offering a CTC of 20 lakh per annum.

Sachin Kumar CW, IV year student has been recruited by Target with a CTC of 12.7 lakh per annum.

Gowthami T P, III year student, has been recruited by Zetabytes with a CTC of 11 lakh per annum.

The Editor's note

We thank our department for giving us the opportunity to proudly present the 5th issue of our newsletter.

Enqueue() In here, we present to you a glimpse of the various activities and events which were organised and held at our Department in the months of January to July, 2020

We also present to you our faculty's outstanding achievements and their publications in various reputed journals and conferences. Finally we showcase various achievements and awards won by our highly talented students. We thank all our teachers and students who have kindly obliged to contribute articles and other content.

-Prof. Pavithra H
Asst. Professor @
CSE department

A highly talented, creative, enthusiastic and hardworking student with interest in dance, social service and exploration.

Shivani C H
Student @
CSE department

Write to us:

We sincerely hope that you found our Department's newsletter informative and enjoyable. Do provide us with your valuable feedback by writing to us at enqueue@rvce.edu.in.