ENQUEUE()

Issue : 01
Volume : 04

January 2020

Dept of Computer Science and Engineering

Message from the Head of the Department

I am happy to present this edition of our departmental newsletter. 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, in bringing new research grants and new research thrusts and reaching cutting edge research in teaching by creating new courses. The creation of newsletter every six months gives us an opportunity to take a stock on how we are progressing towards becoming an even Computer Science Engineering department. Striving for continued progress and betterment of our research, education and service to community, are very important to us. In the last six months we had success in multiple areas. Recent MoU with IBM and Samsung R & D has added value to departmental research activity by providing a development environment on areas such as Artificial Intelligence, Communication and IoT. Our collaboration with various industry leaders such as Citrix R&D, HPE, Neridio systems, IISc's Robert Bosch Centre for Cyber Physical Systems 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. Several industry experts from NOKIA, CISCO, VMWare, HP have visited us and various plans for industry-academic partnership are under various stages of finalisation. Industry visit to Morgan Stanley, AIRBUS on University relations Event held useful for the growth of Centre of excellence in Data Science and Artificial Intelligence. Many University academicians from SUNY Binghamton University, Florida University, Indian Statistical Institute, IISc Bengaluru and others have visited us for academic and research interaction. A team our faculties worked to make an international Conference-a successful event. 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.

The Editor's note

We thank our department for giving us the opportunity to proudly present the 4th 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 August to December, 2019 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 and present a few articles and a piece of poetry.

Prof. Sharadadevi S Kaganurmath

We thank all our teachers and students who have kindly obliged to contribute articles and other content.

Events hosted by our Department

IEEE-CSITSS-2019

The IEEE 4th International Conference on Computational System and Information Technology for Sustainable Solution-2019 (CSITSS-2019) aims to bring together leading academic scientists, researchers and research scholars to exchange and share their experiences and research results on all aspects of Social, Mobility Analytics and Cloud (SMAC). It also provides a premier interdisciplinary platform for researchers, practitioners and educators to present and discuss the most recent innovations, trends, and concerns as well as practical challenges encountered in Social, Mobility Analytics and Cloud. Our proud Sponsors for the conference are HPCC Systems, IBM, Council of Scientific and Industrial Research (CSIR) and Career labs in partnership with BYJU's The Learning App. This conference was held on 20th and 21st DEC 2019.

Invited talk on Elastic search and MongoDb

An invited talk by resource person Mr. Amit Kumar, Software Architect with India Software Lab, IBM was conducted on 10/08/2019 for CSE 5th semester students as part of Course 16CS52: Database Design. The topics covered were on Elastic search and MongoDb. The resource person gave insights into industry environment and technology currently used in the stream. Hands-on sessions were interactive and engaged students all the time on working/learning queries. More than 150 students were present with faculty members handling the course and coordinated the talk such as, Dr. Shobha G, Dr Sowmyarani C N, Dr. Poonam Guli and Dr. Pratiba D were also present.

Technical talk on Cyber Security Technologies for OS and Storage

A Technical talk on "Cyber Security Technologies for OS and Storage " was organised on Monday the 11th feb 2019. The talk was delivered by Mr. Peter Chacko, Founder Director, Neridio Systems, Bengaluru. Cyber security is the protection of computer systems from theft or damage to their hardware, software or electronic data, as well as from disruption or misdirection of the services they provide.

The field is growing in importance due to increasing reliance on computer systems, the Internet and wireless networks such as Bluetooth and Wi-Fi, and due to the growth of "smart" devices, including smart phones, televisions and the various tiny devices that constitute the Internet of things. Due to its complexity, both in terms of politics and technology, it is also one of the major challenges of the contemporary world.

Invited Talk on Cyber Physical Systems by Speaker from IISc

The Department of Computer Science and Engineering, RVCE organised an Invited Talk on Cyber Physical Systems by Speaker from IISc, Bengaluru on 27th JAN 2019 in the CSE Seminar Hall-1. The speakers from Indian Institute of Science –Mr. Stefan Ipach, Manager, Robert Bosch Centre of Excellence for Cyber Physical systems, Bengaluru delivered session on Cyber Physical Systems (CPS) which includes Advanced Driver Assistance systems, Walking Robot, Drones technology and opportunities at IISc for Higher Education, Research and career advancement from 10.00 am to 12.00 pm. The event had student participants from UG CSE 6th semester and 4rd semester and they excelled in gaining knowledge in CPS and opportunities at IISc. The event was coordinated and executed by the faculty Dr. Sowmyarani C N, Assoc. Prof., Dept of CSE. The session was very interactive between the students and experts by discussing more on the CPS technologies and currents projects at IISc.

Awareness Workshop on Cybersecurity Engineering in Academics

Continuing from the encouraging feedback received from 1st Workshop for Teachers in Engineering Colleges that was conducted at IISc on 31st Jan 2019. This second in the series of quarterly workshop for academics in KA, shall bring a focus on the Cyber Security Engineering in Academics. Educational institutes and academics ecosystems are currently going through the same churn of Cyber Security like rest of the industry segments. It's the need at every academic institute to take a critical look

at their Cyber Safety & Digital Security while continue to be relevant for their Educational Programs and Syllabus for 'Cyber Security Engineering' areas. Usage of mobile communication technologies and digital science has benefited all within the ecosystem with power of speed, content generation, research, reachability and collaboration. Therefore, it is pertinent for the academic institutions to not only becomes aware of challenges and risks involved for leveraging these Digital Technologies and related use or abuse of engineering technologies available but also having a right policy at the institution level ensuring the critical information remains secured.

Technical Articles

Proactive cloud service assurance framework for fault remediation in cloud environment - Prof. Jyoti Shetty, Dr. Sathish Babu B, Dr. Shobha G

Cloud resiliency is an important issue in successful implementation of cloud computing systems. Handling cloud faults proactively, with a suitable remediation technique having minimum cost is an important requirement for a fault management system. The selection of best applicable remediation technique is a decision making problem and considers parameters such as i) Impact of remediation technique ii) Overhead of remediation technique ii) Severity of fault and iv) Priority of the application. This manuscript proposes an analytical model to measure the effectiveness of a remediation technique for various categories of faults, further it demonstrates the implementation of an efficient fault remediation system using a rule- based expert system. The expert system is designed to compute a utility value for each remediation technique in a novel way and select the best remediation technique from its knowledge base. A prototype is developed for experimentation purpose and the results shows improved availability with less overhead as compared to a reactive fault management system.

A Greedy Approach to Hide Sensitive Frequent Itemsets with Reduced Side Effects - Prof. B Suma, Dr. Shobha G

Frequent itemsets mining discovers associations present among items from a large database. However, due to privacy concerns some sensitive frequent itemsets have to be hidden from the database before delivering it to the data miner. In this paper, we propose a greedy approach which provides an optimal solution for hiding frequent itemsets that are considered sensitive. The hiding process maximises the utility of the modified database by introducing least possible amount of side effects. The algorithm employs a weighing scheme which

computes transaction weight that allows it to select at each stage of iteration candidate transactions, based on side effects measurement. We investigated the effectiveness of proposed algorithm by comparing it with other heuristic algorithm using parameters such as number of sensitive frequent itemsets, length of sensitive frequent itemsets and minimum support on a number of datasets which are publicly available through the Frequent Itemset Mining (FIMI) repository. The experiment results demonstrated that our approach protects more non-sensitive frequent itemsets from being over-hidden than those produced by heuristic approach.

Secure Publisher Content Sharing Model for Cyber Physical System With Blockchain Based Cloud Storage - Manohar K, Dr. Sowmyarani C N

The cyber physical system in the recent years, has seen a considerable success in large-scale distributed integration environment. Security is one of the major challenge in every system in the present scenario. Publisher subscriber system is one such, where the broker involves in the process of communication and sharing of data between Publisher and its subscriber. Many literatures do not discuss about the security involved in the system. Blockchain is a state-of-the-Art concept on which our system is designed. There is no need of third party to have the validation or the certification. Participants in the blockchain need not be known each other. Existing approaches toward secure pub/sub systems mostly rely on the presence of a traditional broker network or rely on a network of (semi)trusted brokers. The Secure pub/sub system uses AES algorithm for encryption of data and Blockchain for storage. Nevertheless, security in broker-less pub/sub systems, where the subscribers are clustered according to their subscriptions, has not been discussed yet in the literature.

Development of framework for detecting smoking scene in video clips - Dr. Poonam G, Shashank B. N, Athri G Rao

According to Global Adult Tobacco Survey 2016-17, 61.9% of people are quitting tobacco. The reason was the warnings displayed on the product covers, video clips, and advertisments. The focus of this paper is to automate the process of displaying warning messages in video clips. This paper explains the development of a system to automatically detect the smoking scenes using image recognition approach in video clips and then add the warning message to the viewer. The approach aims to detect the cigarette object using Tensorflow's object detection API. Tensorflow is an open source software library for machine learning provided by Google which is broadly used in the field image recognition. At present, Faster R-CNN (Region-based Convolutional Neural Networks) with Inception ResNet is the Tensorflow's slowest but most accurate model. Faster R-CNN with Inception Resnet v2 model is used to detect smoking scenes by training the model with cigarette as an object.

Task Resource Usage Analysis and Failure Prediction in Cloud - Prof. Jyothi Shetty, Rahul Sajjan, Dr. Shobha G

To improve the reliability of the cloud computing system it is important to understand the failure characteristics and to predict failures earlier to avoid it. A statistical analysis of workload data on the cloud provides insights into failure characteristics, which can be used as a cue to improve the reliability of the system. This manuscript discusses a statistical analysis of resource usage data of tasks on the large Google cluster dataset, further failure prediction algorithms are developed to predict the failure. Based on the study, it is observed that there is variation in the resource usage pattern, duration of execution and amount of resource used by a failed task as compared to that of a finished task. Different resampling techniques along with XGboost classifier is used to predict the failure of a task in the highly imbalanced dataset and it is observed that Synthetic minority oversampling along with XGboost predicted the task status with precision of 92% and recall of 94.8% .

Character Recognition in Historical Handwritten Documents – A Survey - Nija Babu and Dr. Soumya A

Digitisation and Recognition of handwritten documents have become popular with the growth of advances in Computing. Even after the introduction of new technologies, handwritten documents continue to be the means of communication and recording information in various fields. Handwritten Character Recognition (HCR) is a subject of research for decades. Many HCR techniques have been developed for applications where documents are written by hand like bank cheques, mail addresses, legal documents, medical prescriptions etc. and have achieved satisfactory performance. But active research is still going on in character recognition from historical documents. HCR becomes more challenging for Ancient Scripts due to the presence of various kinds of noise, low intensity, discoloration etc. Vast amount of knowledge in the field of literature, architecture, history and civilisation, economic factors, medicine etc. have been inscribed and preserved in historical documents in various forms. Even though several techniques have been developed for HCR for Ancient Scripts, promising results have not been achieved. The paper reviews some of the major works carried out in HCR for Ancient handwritten documents.

Research and Publications

Conference Publications

- "Design and Development of IoT Plugin for HPCC Systems " - K.S.Amogh Vardhan, Manjunath Jakaraddi, Dr.Shobha G, Jyoti Shetty, Arjuna Chala, Dan Camper

- "An Approach to Real Time Parking Management using Computer Vision " - Abhiram Natarajan, Keshav Bharat, Guru Rajesh Kaustubh, Sai Praveen P. N., Dr. Minal Moharir, Dr. N. K. Srinath,

- "Software Implementation of an Automatic Movable Road Barrier " - Roopa Ravish, Varun R. Gupta, Nagesh K J , Amruth Karnam, Dr. Shanta Rangaswamy

- "Vertex Magic Total Labelling and Its Application in Cryptography " - Rahul Chawla ,Sagar Deshpande, Prof. M. N. Manas, Saahil Chhabria, Dr. H. K. Krishnappa.

- "Automated Test Script Generation from Natural Language Query" - Dr. Deepamala.N, Tushar Kanakagiri, Shreyas Raghunath, Sughosh Kaushik, Dr.Shobha G, Ankit Singh, Deepak jha

- "Uncertainty Aware Resource Provisioning Framework for Cloud Using Expected 3-SARSA Learning Agent: NSS and FNSS Based Approach " - Bhargavi K, Dr. B. Sathish Babu

Books authored by Faculty

Author: K Badrinath

Contribution of Book Chapter : Chapter 25, Design and Development of Mechanical and Electronic Jacquard Handloom for Fine-Korai-Mat Weaving, Rural Technology Development and Delivery, Design Science and Innovation, Springer, Singapore, pp 335-346, 2019;

Print ISBN 978-981-13-6434-1,

Online ISBN 978-981-13-6435-8

Products developed by Faculty

Faculty: K Badrinath

- "Software Framework for Bitmap Designs to Mat Designs", developed for RuTAG Cell, IIT Madras

- Successfully undertaken & completed the Design, Development & Manufacture of "ARM Microcontroller based All-In-One Product Prototyping Board" , a unique and state of the art product currently available in India.

Student Activities

Our department's pride is its multi-talented students. They are a part of various activities apart form 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 Rotract and participate in activities including Blood donation camps, Paper drives, 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. The department gives its complete support and encouragement to all its students to participate in these activities. Here are a few achievements by are students.

- **Vikram Award**

Winners, Vikram award for best project of 2019, RVCE. Sponsored by Secure Meters, was awarded a funded trip to Delhi and a cash prize of rupees 50000

Team: Abhiram Natarajan, Shubham Phal.
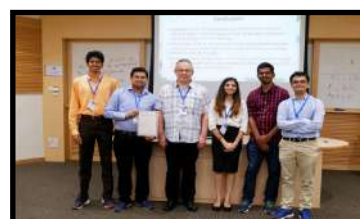
• PES AICodning Competition
Jan 2020, PES Bengaluru, won by our students
Team: Prinyank Kumar Singh, Pulak Pathak, Rounak Jain

• Singapore India Hackathon 2019
Department of CSE has always given major contribution in hackathons. Some of our students took part in Singapore India Hackathon 2019. An international level hackathon along with Singaporean students organised by Ministry of Human Resource Development (MHRD), AICTE and Nanyang Technological University, Singapore and have won the Consolation prize(6th place out of 20 teams from Singapore and India). A cash prize of S$2,000 in the month of September.
Team: Sahana Srinivasan, Akshar Prasad, Prajwal Y R (team named FOOBAR)

• Hackathon by PES University
This hackathon had an Open Hack theme allowing the participants to bring their creativity to the table and come up with great, new ideas to solve different real-world problems of their choice. inGenius will open up opportunities for the participants to meet and interact with fellow developers and mentors. In this hackathon computer science and engineering students have won second place.
Team: Nikitha Srikanth , Sanjana Reddy, Prerana K S

• India Police hackathon 2019
The Karnataka Police Department hosted the 'India Police Hackathon 2019' on November 16 and 17 at RV College of Engineering. The Institute of Electrical and Electronics Engineers (IEEE), the event's knowledge partner, provided mentors and jury for the first ever police hackathon in the state. The IEEE were involved in the online pre-selection of the participants. The objective of the event is to elicit coding solutions from the participants for problem statements like facial recognition, data analytics, developing a unified communication app, a centralised standard beat management solution and connecting online presence for open source intelligence and investigation. The hackathon was open for college students, IT industry, researchers and officials from the police, Defence and other government sectors.

•Microsoft Imagine Cup 2019

Shubham Phal, Yatish HR and Suhas Hebur Eshwar had just stepped into their third year of Bachelor's in Computer Science at R. V. College of Engineering, Bengaluru, when the state of Kerala in India was hit with one of the worst floods of the century. As they researched further, they found that during natural disasters various stakeholders work in silos and there is no unified platform for them to come together, connect, coordinate, and build synergies. Neither is there a concrete way to know whether people are safe or to locate missing people or to ensure rescue measures reached all the disaster-struck areas optimally.

This led the trio to build a solution to empower people during disasters with RVSAFE (read 'Are we safe'), a combination of an Azure-powered Android app and an online platform.

The team identified six major stakeholder groups – victims, rescuers, NGOs, volunteers, weather agencies and people who wish to help. They created RVSAFE as a scalable platform to effectively bring together all the stakeholders and help coordinate their activities during a disaster.

Using machine learning and crowdsourcing, the app notifies affected people about safe and unsafe zones around them, relief camps nearby, and how soon rescuers may reach them. People can upload pictures and the app using Azure Cognitive Services scans them for demographic analytics to assess the number of people, the number of kids and elderly who have been affected. This is used to help rescue operations to ensure maximum people are reached in minimum time.

"We aim to address the complex problem of disaster management effectively using Azure services. The more we think about RVSAFE, the more we believe that it has the potential to become the next big social platform. A platform that can empower the lives of billions," exclaims Phal.

They are inspired by the trio from their college that won the USD 15,000 Big Data award last year at the Imagine Cup world championship. They participated and won at Code.fun.do++, an immersive online challenge spread over four weeks where students work under the guidance of Microsoft mentors, which qualified them to take part in the 2019 Imagine Cup.

"We feel the potential of our idea to solve world problems is being recognised by the global community. Being at Imagine Cup is a milestone in our journey towards helping humanity and we are thankful to Microsoft for all its support," says Eshwar.

The team now looks forward to building their project into a full-scale product and shipping it to disaster-prone zones all over the world.

• **International AUVSI Student Unmanned Aerial Systems (SUAS) 2019**

        Project Jatayu is an interdisciplinary technical team that brings together the fields of mechanical and aerospace design, electrical and electronic control, and computer vision and communication to build autonomous unmanned drones that are capable of perception to both identify targets for air delivery and avoid obstacles, thereby making intelligent decisions on the fly. The team participated in the international AUVSI Student Unmanned Aerial Systems (SUAS) 2019 competition, held annually at Maryland, USA. The competition challenges students to design, integrate, and demonstrate an Unmanned Aerial System capable of autonomous flight and navigation, remote sensing of the surrounding, and air delivery. We performed admirably in the competition completing multiple tasks to secure a rank of 27 among 75 participating teams, also coming as the second best Indian team in the competition

Sports and Cultural Activities and Achievements

• **Prerana KS**
  Event: Badminton, Mime at Bangalore Medical College, Secured second place
  Event: Badminton, Mime at Jain CMS Secured second place

• Competition: VTU Intercollegiate yoga meet -2019-20
  Venue: Hirasugar Institute of Technology, Nidashosi, Belagavi .
  Team:
  1. Rakesha R R (CSE 2nd year)
  2. Bharath Bangari (CSE 2nd year)
  3. Akshay L C (ECE 4th year)
  4. Sudhanva (CSE 4th year)

• **N Pooja**

Competiton: Vtu Inter Zonal Badminton Winners At Sjbit(2018)

Inter Zonals Fourth Place At Sjm Institute Of Technology Chitradurga (2019) Vtu Inter Zonal Winners At Sjbit(2019)

VTU Swimming Competition Overall Championship(2019)

Second Place at Badminton Tournament BMSCE(2019)

• **Nikhit Laxman**

1. Vtu Interzone Winners (Won Vtu Southzone Also).

2. Represented Vtu Team 2018.

3. Highest National Rank 63.

4. Best World Rank 505.

5. Current World Rank 511.

6. Total International Matches Won In The Last Year - 5 Matches.

7. Played 6 International Tournaments In Uganda, Kenya, Bulgaria, Bahrain, Dubai, Mumbai

The Editorial Board

Swathi N R

A highly confident, hardworking and a budding actor who is also an upcoming YouTuber.

Vishak S Bharadwaj

A Classical musician with a love for Mathematics and Philosophy. Foodie and an avid chess Player :)

Write to us:

We sincerely hope you 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*.