DATA GLIMPSE

A Newsletter of Department of Computer Science and Engineering (Data Science)
SOE, DSU, Bangalore

DSU

VISION AND MISSION

Vision

To be a centre of excellence in education, research & training, innovation & entrepreneurship and to produce citizens with exceptional leadership qualities to serve national and global needs.

Mission

To achieve our objectives in an environment that enhances creativity, innovation and scholarly pursuits while adhering to our vision

Data Science

VISION AND MISSION

Vision

To endow the succeeding generation of engineers for a data-centric world by expanding their capacity to contribute in the field of data science by providing an absolute resolution in social aspects.

Mission

- To develop the Department of CSE (Data Science) as a Center of Excellence in Data Science domain by imparting Quality Education and Research to the students.
- To motivate the students to be ethical data science practitioners and innovators in data-driven global society.

Dayananda Sagar University, Innovation Campus, School of Engineering
Kudlu Gate, Hosur Road, Bengaluru - 560 068

DEAN'S MESSAGE

Dr. Udaya Kumar Reddy K R
Dean - School of Engineering
Professor, Dept. of Computer Science and Engineering
DSU

I am delighted that the Department of Computer Science and Engineering (Data Science) is bringing out the newsletter that can provide wonderful insights for students and faculty fraternity.

A lot has been happening in the school of computing sciences over the years, and one of the significant changes involves this newsletter.

Our graduate students are doing amazing things in many different areas in different ways. In the current issue, you'll meet some remarkable students and faculty who are making a difference in the technical aspects and otherwise. We are hoping to build this endowment with your support, to afford even more opportunities for students to take part in this important component of their graduate education.

I hope this magazine provides the reader a wonderful insights and I thank the editorial team for their wonderful effort in bringing out this newsletter.
Wish you all the best.

CHAIRPERSON'S MESSAGE

Dr. Shaila S G
Professor & Chairperson
Department of CSE (Data Science),
SOE,DSU

It gives me immense pleasure and pride to introduce the first volume Issue three of the Newsletter **DATA GLIMPSE** from the Department of Computer Science & Engineering (Data Science). The department is designed to bridge the industry gaps in terms of research and development using cutting-edge technologies. The department aims to meet the requirements of various job roles in Data Science.

The students and faculty members of the department have contributed technologically to solving real-world challenges through projects, hackathons, and quizzes. The program has offered various workshops and webinars for the students to develop their skills and knowledge in multiple domains. These events are effectively captured in the newsletter in the form of articles and achievements. I hope the Data Science newsletter motivates and encourages the students and faculty members with ample opportunities and exposure.

I thank the students, faculty members, and the editorial team for their wonderful efforts in bringing out this newsletter.

"Data science isn't about the quantity of data but rather the quality." — Joo Ann Lee

ABOUT THE PROGRAM

B.Tech CSE (Data Science) is a 4-year undergraduate degree programme. Data Science teaches the students how to combine Machine Learning techniques, algorithms, tools, business acumen and mathematics and apply on raw data to extract insight information from it. In short, technology algorithm development and data inference are blended together to solve complex problems analytically in Data Science.

Throughout the entire duration of the programme, the students are taught how to amalgamate business knowledge, tools and statistics to generate business value in creative ways.

The four-year undergraduate curriculum includes a detailed delivery of Basic Sciences, Mathematical Foundations, Statistical Foundations, Artificial Intelligence, Machine Learning, Data Science, Deep Learning, and Data Visualisation.

The curriculum imparts 21st century skills having the following components: Liberal education aspects for all round development, courses that trigger new age skills, project based learning, special topics (hands-on sessions on multiple topics with mentoring from expert), option for MOOC, UG Research Project/Product Development/Internships.

The curriculum focuses on Liberal Art Courses, Foundation Courses, Professional Courses, and Electives that helps them build expertise in some specialised areas. Curriculum developed also emphasis on Design oriented thinking, Communication, Collaboration and Creativity right from 1st year.

A degree in Computer Science (Data Science) can lead to the following job roles in a variety of industries such as Retail, Finance, E-commerce, Healthcare, IT services:

- Data Scientist
- Data Analyst
- Business Analyst
- Data Engineer
- Senior Data Engineer
- Senior Data Analyst
- Data Director

What's inside...

"Playing with Data - Towards Data Science." — Shaila S G

FACULTY LIST

Dr. Shaila S G
Professor & Chairperson

Dr. Shaila S G has earned her Ph.D in Computer Science from NIT, Trichy, Tamil Nadu for her thesis on "Multimedia Information Retrieval in Distributed System". She has 17 years of experience in teaching & research in the concerned field. She has worked for CPRI, Bangalore as a Trainee Engineer. Later, she worked as a Research Fellow for a DST project, India for a period of 3 years. She has also worked in Indo-US collaborated project for “Obama-Singh Knowledge Initiative Program” in the University of Nevada (UNLV), Las Vegas, United States. She is a certified IBM trainer for the Business Intelligence. Her research areas are Data mining, Information Retrieval, Image Processing and Computational Neuroscience. She has published more than 50 research articles in reputed Journals and Conferences, books and book chapters. She has 11 Indian Patents and 2 Australian Patents.

Dr. Rajeev Airani
Professor of Practice

Dr. Rajeev Airani is working as a Professor of Practice in the Department of CSE (Data Science). He is a co-founder and Chief Operating Officer & Head of Analytics at CanPe Solutions India Private Limited, Bangalore, India. His primary research interests are in AI/ ML enabled big data, social media and data analytics. He has extensive data analytics experience across different domains including CPG/ Retail, BFSI, IT Services and Telecom. He is a published author and holds 3 patents to his credit.

Dr. Kakoli Bora
Associate Professor

Dr. Kakoli Bora is an Associate Professor in the Department of CSE (Data Science). She had completed her Ph. D. in Computer and Information Science (Astroinformatics) from Visveswaraya Technological University, Belagavi, Karnataka. Her thesis title is Machine learning approach to understanding Astrophysical Data: The Final frontier: Novel Algorithmic study. She has 17 years of teaching & research experience in the field of Computer Science. She has worked for a startup named Happymonk AI Labs as Senior Data Scientist. Her research interests include Data mining, Image Processing and Deep Learning. She has published more than 15 research articles in reputed Journals and Conferences. She has published two book chapters.

Prof. Shivamma D
Assistant Professor

Shivamma D is working as an Assistant Professor in the Department of Computer Science and Engineering (Data Science). She is pursuing Ph.D in Dayananda Sagar University, Bengaluru. She completed her M.Tech from Birla Institute of Technology and Science (BITS), Pilani (Rajasthan). She has an extensive experience of 7 years in the field of Teaching and Research. She has worked as an IT Officer/IT Programmer/Data Analyst at National Institute of Mental Health And Neuro Science (NIMHANS), An Institute of National Importance, Government of India located at Bangalore. Her research interests are in the area of Technology Enabled Digital Learning, Machine Learning, Image Processing, Computational Neuroscience, Big Data Analytics and Data Science.

"Data is the language of the power holders." — Jodi Petersen

FACULTY LIST

Prof. Monish L
Assistant Professor

Monish L is working as an Assistant Professor in the Department of Computer Science & Engineering (Data Science). He is pursuing Ph D on Image Analytics in Dayananda Sagar University. He has completed M. Tech from Dayananda Sagar University, and B.E. from The Oxford College of Engineering. He has 1 year of industrial experience in ADAS. He is a certified trainer of JAVA and FSD from Virtusa. He has published 3 Book chapters in an international journal. His paper is awarded with the best paper award in the ICAMIDA 2022 conference. His areas of interest are Data Mining, Knowledge Discovery, Data Analytics, Machine Learning and Artificial Intelligence.

Prof. Sindhu A
Assistant Professor

Sindhu A is working as an Assistant Professor in the Department of Computer Science & Engineering (Data Science). She has completed M.Tech from Dayananda Sagar University, and B.E. from BMS College of Engineering,Bangalore.Worked as an intern in Tech Citi Technologies. She has published 3 research papers. Areas of interest are Computer Vision, Machine Learning,Data Mining,Artificial Intelligence and Image Processing.

Prof. Vaishali Bagewadikar
Assistant Professor

Vaishali Bagewadikar is working as an Assistant Professor in the Department of Computer Science and Engineering (Data Science). She has completed her M.Tech from University of Visveswaraya College of Engineering, Bangalore and BE from Basaveshwara Engineering college, Bagalkot. She has 7 years of teaching experience and 1 year of industry experience from Unisys India Pvt ltd. Her area of interests are cloud and Fog computing, Machine learning, Data Science.

"The goal is to turn data into information, and information into insight." — Carly Fiorina

ARTICLES

Data Analytics for Sarcasm Detection in Social Media Sites

Nowadays, due to rapid growth in web technologies and internet usage, lots of data is generated and available in the webpages. People are using social media websites like Facebook, Instagram, Twitter and Google to connect to others and exchange their knowledge, opinions and thoughts through these common platforms. In the current generation, an individual's opinion is expressed on social media. These opinions can be sarcastic comments which is represented as capital letters, emojis, and interjection marks. Sarcasm plays a major role in criticising other people's ideas, views, etc. It can be expressed in different ways like a direct conversation, speech, text etc. Detection of sarcastic content is vital to understand the behaviour of the people or the community. Hence, the analysis of sarcastic data can be extended to social media platforms like Twitter, Instagram, etc. Sarcasm classification is done using various NLP based systems using text summarisation techniques. Deep Learning frame-work is proposed to identify the sarcasm in the tweets. RNN and LSTM approaches are used to build lightweight deep neural networks in which depth wise separable convolutions are used for sarcasm detection. The approach used simple sentence patterns to determine sarcasm which is very challenging as the sentences are short and simple. The NLP model should be efficient enough to predict the sentences as sarcasm. The sentence expresses the negative opinion in a positive way. These views represent a variety of sentiments, which range from extreme positive to extreme negative. Most of the organisations leverage these views in an attempt to market their products better. Twitter sarcasm analysis allows to keep track of what's being said about a product or service on social media, and can help detect angry customers or negative mentions before they escalate. Carefully listening to the voice of the customer on Twitter using sarcasm analysis allows companies to understand their audience, keep on top of what's being said about their brand and their competitors and discover new trends in the industry.

Dr. Shaila S G
Professor & Chairperson
Department of CSE
(Data Science)
SOE, DSU

"Big data isn't about bits, it's about talent." — Douglas Merrill

What is Reproducing Kernel? A Gentle Introduction

Statistical Learning Theory (SLT) draws many implications from Hilbert Spaces. Especially from Reproducing Kernel Hilbert Spaces (RKHS). This short article attempts to capture the intuitive understanding of Kernels and Reproducing Kernels which form the basis of RKHS and their applications. Terms like dot product, inner product and function space are used very loosely in this write-up to make it easier to illustrate. For strict mathematical representation of the topic please check the references listed at the end.

A kernel is simply a function which takes vectors as inputs and outputs the dot product of the vectors in feature space. For example, consider two vectors in 2-d space and their transformation into 3-d space. The dot product between these two 3-d transformed vectors is in feature space. The function which achieves this is referred to as kernel and the transformation is referred to as feature map. Consider a dataset which has some rows and few features. Now, rows are vectors and columns are features. If we apply kernel function on any 2 rows and transform them into higher dimensional space (for example like polynomial expansion), then the dot products between them is a value in feature space. Thus, instead of representing vectors in feature space based on their coordinates, it is easier to represent them based on their inner products. The advantage is that instead of computing the transformed vectors one can directly compute their dot product and use it as their representation in feature space. Many algorithms may just require this dot product to compute the solution, thus kernels come in very handy. Kernels can be combined to create new kernels. Kernel can be chosen arbitrarily as long as Mercer's conditions are satisfied.

Reproducing Kernel: Now, consider a space of functions where function at a point represents the evaluation of the function at that point. This also means that feature map can be represented as a simple function. Now, the dot product between the function from a given function space and feature map at a point in feature space is nothing but the evaluation of the function at that point in the feature space. Simply put, the reproducing kernels come from the space where the bases are kernels and the points are the dot products between the function chosen and feature map. The space formed by reproducing kernels is the Reproducing kernel Hilbert Space (RKHS). This idea has been extensively used in SVM to solve non-linear problems.

References:

1. Ghojogh, B., Ghodsi, A., Karray, F., & Crowley, M. (2021). Reproducing Kernel Hilbert Space, Mercer's Theorem, Eigenfunctions, Nyström Method, and Use of Kernels in Machine Learning: Tutorial and Survey. ArXiv, abs/2106.08443.

2. Thomas Hofmann. Bernhard Schölkopf. Alexander J. Smola. (2008), "Kernel methods in machine learning." Ann. Statist. 36 (3) 1171 - 1220, June 2008.

Dr. Rajeev Airani
Professor of Practice
Department of CSE
(Data Science)
SOE, DSU

"Data fabric is the next middleware" -- Todd Papaioannou

A New Activation Function for ANN Based Habitability Classification

For hundreds of years, astronomers and philosophers have considered the possibility that the Earth is a very rare case of a planet as it harbours life. This was partly due to the fact that after the initial missions exploring our neighbours Mars and Venus, no traces of life were found. However, over the past two decades, discoveries of exoplanets have poured in by the hundreds and the rate at which exoplanets are being discovered is increasing. In order to find interesting samples from the massive ongoing growth in the data, a sophisticated pipeline may be developed which can quickly and efficiently classify exoplanets based on habitability classes. Some of the methods of detecting exoplanets include radial velocity based detection, gravitational lensing, etc. The data collected is imperfect and sometimes difficult to analyse with certainty. Given the rapid technological improvements and the accumulation of a large amount of data, it is pertinent to explore advanced methods of data analysis to rapidly classify planets into appropriate categories based on physical characteristics.

Existing work on characterising exoplanets are based on assigning habitability scores to each planet which allows for a quantitative comparison to Earth. The Cobb-Douglas Habitability Score (CDHS), makes use of econometric modeling to find the similarity of a planet to Earth. The CDHS score of a planet is calculated based on radius, surface temperature, escape velocity and density of the planet. We explore the efficacy of using a novel activation function in Artificial Neural Networks (ANN) in characterising exoplanets into different classes. We call this Saha-Bora Activation Function (SBAF) as the motivation is derived from a long standing understanding of using advanced calculus in modeling habitability scores of Exoplanets. The function is demonstrated to possess nice analytical properties and doesn't seem to suffer from local oscillation problems. The exoplanets are classified into habitable or non-habitable based on their CDHS scores. The data used in the current work is from the PHL-EC (University of Puerto Rico's Planetary Habitability Laboratory's Exoplanet Catalog). This dataset contains over 3600 samples. An ANN was trained on this dataset by replacing sigmoid function with SBAF. The new activation function used for training a neural network for habitability classification boasts of an optima. We observed less flattening of the function and therefore the formulation should be able to tackle **local oscillations** more easily as compared to the more generally used sigmoid function. It has been observed that the second order derivative of the function is either greater than 0 or less than 0, so there is **no saddle point**. Instead of using ” black-box” methods for classification, we embarked upon understanding activation functions and their role in Artificial Neural Net based classification.

Dr. Kakoli Bora
Associate Professor
Department of CSE
(Data Science)
SOE, DSU

"Data is the new oil." -- Clive Humby

Predictive Analytics for Rainfall using machine learning models

India is endowed by the southwestern monsoon, which irrigates over half of India's land. Average annual rainfall in India is 300-600mm. But rainfall will fickle throughout the year. This makes prediction very challenging. However, Rainfall Prediction is not only an important aspect for famers in rural India, but it is also concerned with the people living in Metropolitan cities. These days, once a year rainfall drain most of the cities in the country due to the poor infrastructure or planning. Stochastic models were used to forecast the rainfall. Due to the composite patterns of the rainfall, it is difficult for the model to understand and predict the rainfall. Due to the vigorous nature of the environment, statistical techniques fail to forecast the rainfall. Too much rain or too less of rain leads to serious condition like flood or drought. Predicting the rainfall accurately is a solution to many serious problems. From saving the lives of the people to planning a farmer's crop, rainfall prediction will enhance the growth of the country's economy. Predicting the rainfall will definitely help the government and the people living in the demoted areas. Rainfall prediction can be achieved by using advanced computer models and simulation tools. To reliably understand and compute the complex patterns from the previous data, there is need of efficient algorithms. The approach to fix the problem concerned with the nonlinear data is the machine learning models. Artificial Neural Network (ANN) and Support Vector Machine (SVM) are used to overcome the downsides of the traditional methods used for rainfall prediction. A detailed survey on rainfall predictions is being carried out in the past twenty-five years. From the survey it has been found that most of the researchers used different models for rainfall prediction, but keras model of ANN gives significant results. ANN is the model with least mean squared error and accurate prediction. The survey also gives a conclusion that the forecasting techniques like SVR is suitable in rainfall prediction compared to the statistical and numerical methods.

Prof. Monish L
Assistant Professor
Department of CSE
(Data Science)
SOE, DSU

"It's easy to lie with statistics It's hard to tell the truth without statistics."— Andrejs Dunkels

Effective task scheduling in Fog computing environment

Cloud computing is very popular in the technology world as it provides numerous useful services to end users. Cloud computing is based heavily on virtualisation technology and provides many features such as huge processing power, great storage provision, and pay-per-use model with desirable features such as flexibility, scalability, performance-cost efficiency, and ease of test, adopting and deploying new technologies. The cloud and users are physically far away from each other that induce intolerable delay, there can be a shortage of resources for executing the tasks, many resources could remain idle even though tasks need to be processed, etc.

To overcome these disadvantages, Fog computing, which is a middle layer between cloud and IoT devices, was proposed. In Fog computing environment, IoT devices are connected to Fog devices. These devices are located in close proximity as compared to cloud to users and are responsible for intermediate computation and storage. Task scheduling is one of the challenges in fog computing. Tasks are broadly classified into two category, dependent task and independent task. While performing task scheduling in fog, the category of tasks plays a vital role. Task scheduling involves scheduling of resources, such as CPU, memory. Depending on the type of task, algorithm may varies. The basic idea behind task scheduling is to give the user QoS (Quality of Service).

This work focuses on how to improve the utilisation of fog resources ensuring more tasks be executed on the fog within time constraints and how to reduce the impact of the mobility of fog nodes on resource allocation because of the high mobility of some fog nodes in the fog layer. A contract-based resource sharing among fog clusters is proposed, making full use of the fog resources and reducing the task response time. With the resource sharing of fog clusters, a scheduling method is proposed based on functional domain construction, which can ease the negative effect incurred by the mobility of fog nodes. Finally, through extensive simulation experiments it can be shown that generally MD1, MD2, CSF have better performance in the metrics of average service time, the success rate of tasks and the average utilisation of fog nodes, and CSF is relatively better than MD1, MD2. As the metric of average WLAN delay, the difference among these methods is not very obvious when the number of users is not very large. But when the number of users is relatively large, the advantages of MD1, MD2, CSF begin to show up. Although the success rates of tasks for these five methods are definitely different, as for the metric of average cost of successful tasks, CSF, CSL perform better than the other three methods. In general, the proposed method CSF can relatively have better performance compared with the other four methods.

Prof. Vaishali Bagewadikar
Assistant Professor
Department of CSE
(Data Science)
SOE, DSU

"Passion provides purpose, but data drives decisions." - Andy Dunn

PROGRAMME EVENTS

DIYA DESIGNING COMPETITION

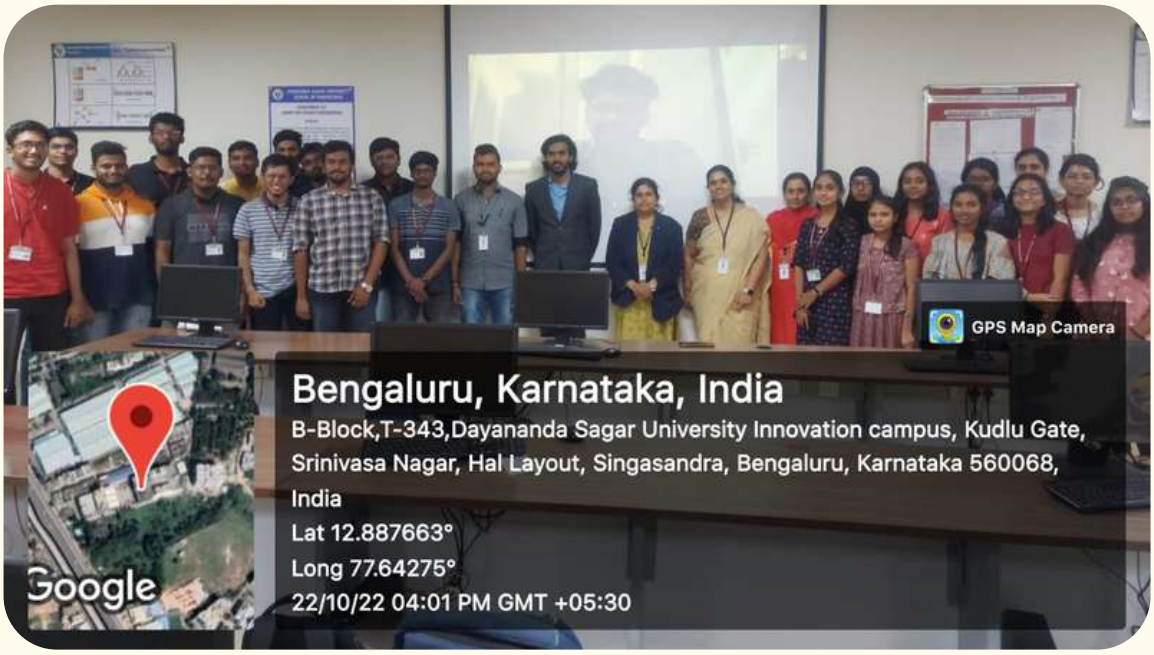
On this occasion of Diwali, under the DataScience@DSU Club, Department of CSE (Data Science) organised Diya Designing Competition on 21st October 2022 at DSU. Diwali is one of India's biggest festivals. The meaning of Diwali is rows of lighted lamps, this is the festival of lights. Hindus celebrate it with joy. In this festival, people light up their houses with Diyas With the excitement of this festive season in the air, the students of 3rd and 5th Semester Data Science students participated in the Diya Designing Competition. They displayed their creativity by decorating the earthen lamps beautifully. Students also learnt about the significance of lighting Diyas on Diwali.

The Best Diyas were awarded as winners.
1st Place - Akshaya & Bindhu
2nd Place - Dhanusha R, Hrithika N & Sowmya Raj
3rd Place - Gagana Malleshachari, Vaibhavi Akshita Reddy & Chethan S

HANDS-ON WORKSHOP "DATA SCIENCE FOR DUMMIES"

Under the DataScience@DSU Club, the Department of Computer science and Engineering (Data Science) organised an offline Hands-On Workshop "Data Science for Dummies" on 22nd October 2022 organised by Dr. Shaila S G, Professor and Chairperson, Dept. of Data Science, Prof. Shivamma D, Assistant Professor, Prof.Monish L, Assistant Professor, and Prof. Vaishali Bagewadikar, Assistant Professor, Dept. of CSE (Data Science). The targeted audience was 2nd and 3rd year students of the Department of CSE (Data Science). Around 90+ students were registered for the Data Science for Dummies and 40+ students attended the workshop.

The event was inaugurated with a commencement speech by Dr. Shaila S G., Professor and Chairperson, Dept. of CSE (Data Science). The Speaker Mr. Ayush started with the introduction to Data Science and he gave a detailed overview of Data warehousing and OLAP-OLTP technology exploring the significance of Industrial work like decision support. Data warehousing and OLAP (On-line Analytical Processing) tools are essential for decision-making and have the ability to focus on databases of industry. And he explained the difference between the requirements of database technology compared to OLTP (On-line Transaction Processing) application. Mr Ayush and Mr Sumit helped the students to explore the Kaggle site to download the data set and to work on the large data. Students performed a number of exercises throughout the life cycle of the data warehouse to drive home complete understanding of the data warehouse development process and its issues. At the end of the workshop an evaluation was carried out and the students have performed satisfactorily, feedback was taken from the students and it was found to be satisfactory.



"Data will talk to you if you are willing to listen". — Jim Bergeson

INDUSTRY SUMMIT "BANGALORE TECH SUMMIT 2022"

The Department of CSE (DS), 5th semester students visited the Bangalore Tech summit - 2022 on 17th November 2022, More than 40+ students visited the Tech Summit in Bangalore. In the Tech summit the students have interacted with multiple companies and entrepreneurs. The students gained insight about the different data science roles/jobs/internship. **Prof. Sindhu A,** Assistant Professor, Dept. of CSE (DS) coordinated with students.

Takeaways:

- New Technologies exposure in various domains by more than 300 software Companies.
- Students interaction with Techies with respect to Data science job roles/Internships for the above mentioned domains.

"We are surrounded by data, but starved for insights."— Jay Baer

"YOUNG INDIA- IDEATHON-2022"

The DataScience@DSU club, Department of Computer Science and Engineering (Data Science) in the association with CSI has successfully organised "Young India-Ideathon 2022" 10th December 2022. The targeted audience were 1st year students of DSU. Around 100+ students were registered and 27 teams were participated in the Ideathon. The Chief Guest was welcomed by Dr. Rajeev Airani and Dr Shaila S G. Problem statement was provided to the students and Dr Rajeev Airani explained the evaluation criteria and presentation guidelines.

Chief Guest: Mr. Vikas Bharti, Delivery Manager, Cardinal Health, Bangalore
Judges: Mr. Vikas Bharti, Dr. Rajeev Airani & Dr. Shaila S G.

The objectives of the event:

* To help the students sharpen their minds and give them the opportunity to express themselves.
* To inculcate a culture of innovative thinking and problem-solving skills in students.
* To inspire students to adopt entrepreneurial endeavours to develop their innovation, work on profitable and socially responsible projects and adhere to high ethical standards.

Winners:

1st Place:	2nd Place:	3rd Place:
1. Shilpa Singh	1. Vinuraj Vamsi	1. Adeesh
2. Shreya Sridharan	2. Dhruti Purushotham	2. Anshul
3. Shaikh Aaman	3. Vishal Binil	3. Anusha
4. Roopak Raghu	4. Soundaraya Jois	4. Amrita

"Where there is data smoke, there is business fire."—Thomas Redman

PARENT TEACHER MEETING - 5TH SEMESTER STUDENTS

The Department of Computer Science and Engineering (Data Science) has successfully organised Parent Teacher Meeting for 5th Semester students on 10th December, 2022. A formal welcome address to parents was presented by the Dr. Shaila S G, Professor and Chairperson, Department of CSE (Data Science), Class advisors Prof. Shivamma D, Assistant Professor and Batch coordinator Dr. Rajesh T M, Associate Professor. The meeting included the importance of Parent-Teacher's meeting in both, students' and organisations point of view.

Actions Taken

- The class advisor gave individual feedback about the students to their parents, suggested some corrective measures and gave an overall performance report of IA1 and IA2.
- Parents were asked if they had any complaints regarding their wards, to which appropriate measures would be taken.
- Parents were asked if they had any suggestions or feedbacks for the organisation in any aspect, for which a detailed feedback form was provided.

"Data is a precious thing and will last longer than the systems themselves." – Tim Berners-Lee

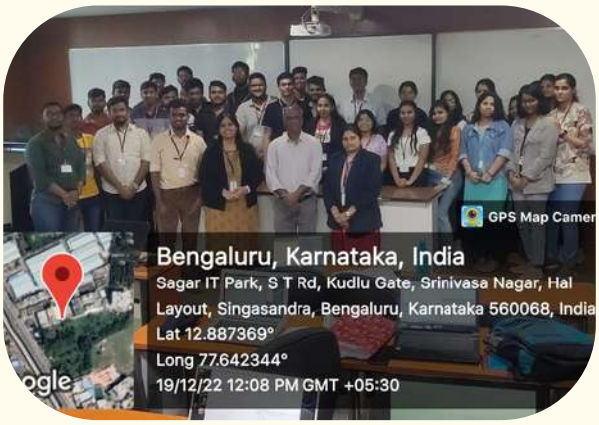
PARENT TEACHER MEETING - 3RD SEMESTER STUDENTS

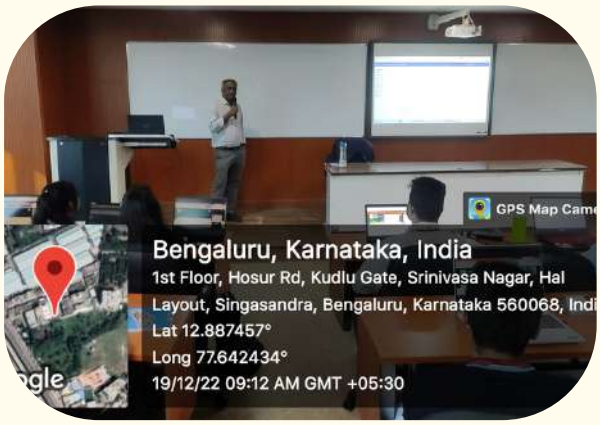
The Department of Computer Science and Engineering (Data Science) has successfully organised Parent Teacher Meeting for 3rd semester students on 24th December, 2022 respectively. A formal welcome address to parents was presented by the Dr. Shaila S G, Professor and Chairperson, Department of CSE (Data Science), Class advisor Prof. Monish L, Assistant Professor. The meeting included the importance of Parent-Teacher's meeting in both, students' and organisations point of view.

Actions Taken

- The class advisor gave individual feedback about the students to their parents, suggested some corrective measures and gave an overall performance report of IA1.
- Parents were asked if they had any complaints regarding their wards, to which appropriate measures would be taken.
- Parents were asked if they had any suggestions or feedbacks for the organisation in any aspect, for which a detailed feedback form was provided.

VALUE ADDED COURSE "KNOWLEDGE DISCOVERY MODELS USING R AND WEKA"





The DataScience@DSU club, Department of Computer Science and Engineering (Data Science) in the association with CSI has successfully organized a value added course on “Knowledge Discovery Models using R and Python" on 19th - 23rd December, 2022. The targeted audience were 3rd and 5th semester students. Around 30+ students participated in the Value added course. In house faculties Dr. Rajeev Airani and Dr. Shaila S G gave an insight of WEKA and R programming tools to the students. At the end of the value added course an evaluation was carried out and the students have performed satisfactorily, feedback was taken from the students and it is found to be satisfactory.

In house faculties: 1. Dr. Shaila S G
2. Dr. Rajeev Airani

Agenda of the event:

Day 1: Dr. Rajeev briefed about the WEKA Tools including installation and hands-on project
Day 2: Dr. Shaila S G explained about the basics of R programming.
Day 3: Dr Rajeev gave a hands-on session on R programming aspects for Data Science Projects
Day 4: Dr. Shaila S G gave an insight on knowledge discovery models
Day 5: Hands-on session on various Project on Machine Learning models for knowledge discovery

The objectives of the event:

- The basics of data analysis using R programming
- Understanding R and WEKA for analytical programming
- Implementing Data visualization in R and WEKA
- Knowledge Analysis using data pre-processing, clustering, classification, regression, visualization in WEKA tool

“Good Big Data teams will be very tolerant of failure”.— Graham Oakes

FACULTY ACHIEVEMENTS

Dr. Shaila S G
Professor and Chairperson
Department of CSE (Data Science)

Best Paper Award

- Rajesh TM, Renuka Devi MN, **Shaila SG**, Cauveri Raju won the **BEST PAPER AWARD** for presenting a paper "A novel framework for grading of Heart attack", in International Conference on Applications of Machine Intelligence and Data Analytics 2022, ICAMIDA 2022, Springer held on 22-24 December, 2022 , MGM University

- Monish L, **Shaila SG**, Shivamma D, Sumana SG won the **BEST PAPER AWARD** for presenting a paper "Rainfall forecasting using machine learning techniques", in International Conference on Applications of Machine Intelligence and Data Analytics 2022, ICAMIDA 2022, Springer held on 22-24 December, 2022 , MGM University

Session Reviewer

- **Dr. Shaila S G**, Professor and Chairperson, Department of CSE (DS) reviewed papers on Fourth IEEE International conference held on 23rd and 24th December, 2022 organised by the Department of Computer Science & Engineering (AI/ML) and Department of Information Science & Engineering, JSS Academy of Technical Education, Bengaluru.

- Dr. Shaila S G, Professor and Chairperson, Department of CSE (DS) reviewed papers in International Conference on Applications of Machine Intelligence and Data Analytics 2022, ICAMIDA 2022, Springer held on 22-24 December, 2022, MGM University

- Dr. Shaila S G, Professor and Chairperson, Department of CSE (DS) reviewed papers has reviewed 4 papers in IEEE International Conference on Artificial Intelligence and Data Engineering (AIDE-2022) organised by NMAMIT, Nitte in association with IEEE Bangalore Section at NMAM Institute of Technology, Nitte, Karkala during 22-23 December, 2022.

Research Publication

- Vijayalaxhmi Inamdar, **Shaila SG**, Ganapati Bhat, Hithyashi K, Arya Suresh (Accepted) - "Early Detection of Breast Cancer based on HER-2 DNA Genomic Sequence" in proceedings of Intl. Conference on Applications of Machine Intelligence and Data Analytics (ICAMIDA 2022), Springer, 22-24 Dec, 2022.

- **Shaila SG,** Shivamma D (Accepted) - "Facial Expression Recognition for Compound Emotions using Mobile Net Architecture" in proceedings of Intl. Conference on Artificial Intelligence and Data Engineering (AIDE 2022), IEEE, 22-23 Dec, 2022.

"Data really powers everything that we do."— Jeff Weiner

FACULTY ACHIEVEMENTS

Contd.

- Vinod D, **Shaila SG** (Accepted) - "Sentence pattern based Sarcasm Detection and Classification using Long Short Term Memory Model" in proceedings of Intl. Conference on Artificial Intelligence and Data Engineering (AIDE 2022), IEEE, 22-23 Dec, 2022.
- **Shaila SG,** Vinod D (Accepted) - "Twitter Data-based Sarcastic Sentiment Analysis using Deep Learning Framework" in proceedings of Intl. Conference on Artificial Intelligence and Data Engineering (AIDE 2022), IEEE, 22-23 Dec, 2022
- **Shaila SG**, Gurudas VR, Monish L, Shivamma D, Sneha N, Leka Chowdary M (Accepted) - "Breast Cancer Detection based on Deep Neural Network using Multi-Model Features" in proceedings of Intl. Conference on Artificial Intelligence and Data Engineering (AIDE 2022), IEEE, 22-23 Dec, 2022
- **Shaila SG,** Sindhu A, Shivamma D, Monish L, Vaishali B(Accepted) - Speech Emotion Recognition using Machine Learning Approach in proceedings of Intl. Conference on Applications of Machine Intelligence and Data Analytics (ICAMIDA 2022), Springer, 22-24 Dec, 2022.

"Who has the data has the power."— Tim O'Reilly

FACULTY ACHIEVEMENTS

Prof. Shivamma D
Assistant Professor
Department of CSE (Data Science)

- Registered for **Ph.D** at DSU
- Galactic Mentor for NASA Space Apps Challenge 2022 in the International Hackathon hosted by DSU virtually during 1st -2nd October, 2022.
- Attended a One week Faculty Development Programme on "Data Science and Machine Learning" organised by New Horizon College of Engineering from 17th November 2022 - 22nd November 2022
- Gained a certification on "Data Analysis using Python" awarded by IBM on 28th November, 2022
- Attended a Faculty Enrichment Program organised by LTIMindtree, Bangalore on 13th December, 2022.

Research Publication

- Shaila SG, **Shivamma D** (Accepted) - "Facial Expression Recognition for Compound Emotions using Mobile Net Architecture" in proceedings of Intl. Conference on Artificial Intelligence and Data Engineering (AIDE 2022), IEEE, 22-23 Dec, 2022.
- Shaila SG, Gurudas VR, Monish L, **Shivamma D,** Sneha N, Leka Chowdary M (Accepted) - "Breast Cancer Detection based on Deep Neural Network using Multi-Model Features" in proceedings of Intl. Conference on Artificial Intelligence and Data Engineering (AIDE 2022), IEEE, 22-23 Dec, 2022
- Shaila SG, Sindhu A, **Shivamma D**, Monish L, Vaishali B (Accepted) - Speech Emotion Recognition using Machine Learning Approach in proceedings of Intl. Conference on Applications of Machine Intelligence and Data Analytics (ICAMIDA 2022), Springer, 22-24 Dec, 2022.
- Monish L, Shaila SG, **Shivamma D,** Sumana SG won the **BEST PAPER AWARD** for presenting a paper "Rainfall forecasting using machine learning techniques", in International Conference on Applications of Machine Intelligence and Data Analytics 2022, ICAMIDA 2022, Springer held on 22-24 December, 2022 , MGM University

"Data are just summaries of thousands of stories" - Chip & Dan Heath

FACULTY ACHIEVEMENTS

Prof. Monish L
Assistant Professor
Department of CSE (Data Science)

- Registered for Ph.D at DSU
- Monish L from Dayananda Sagar University has participated in the Train the trainer program on **Full Stack Engineering** held during June and July 2022 by Virtusa. He is the certified trainer for Full Stack Engineering.
- Attended a One week Faculty Development Programme on **"Data Science and Machine Learning"** organised by New Horizon College of Engineering from 17th November 2022 - 22nd November 2022

Research Publication

- **Monish L**, Shaila SG, Shivamma D, Sumana SG won the **BEST PAPER AWARD** for presenting a paper "Rainfall forecasting using machine learning techniques", in International Conference on Applications of Machine Intelligence and Data Analytics 2022, ICAMIDA 2022, Springer held on 22-24 December, 2022 , MGM University

- Shaila SG, Gurudas VR, **Monish L**, Shivamma D, Sneha N, Leka Chowdary M (Accepted) - "Breast Cancer Detection based on Deep Neural Network using Multi-Model Features" in proceedings of Intl. Conference on Artificial Intelligence and Data Engineering (AIDE 2022), IEEE, 22-23 Dec, 2022
- Shaila SG, Sindhu A, Shivamma D, **Monish L**, Vaishali B (Accepted) – "Speech Emotion Recognition using Machine Learning Approach" in proceedings of Intl. Conference on Applications of Machine Intelligence and Data Analytics (ICAMIDA 2022), Springer, 22-24 Dec, 2022.

"Data beats emotions." — Sean Rad

FACULTY ACHIEVEMENTS

Prof. Sindhu A
Assistant Professor
Department of CSE (Data Science)

Research Publication

- Shaila SG, **Sindhu A**, Shivamma D, Monish L, Vaishali B (Accepted) – "Speech Emotion Recognition using Machine Learning Approach" in proceedings of Intl. Conference on Applications of Machine Intelligence and Data Analytics (ICAMIDA 2022), Springer, 22-24 Dec, 2022.

Prof. Vaishali B
Assistant Professor
Department of CSE (Data Science)

Research Publication

- Shaila SG, Sindhu A, Shivamma D, Monish L, **Vaishali B** (Accepted) – "Speech Emotion Recognition using Machine Learning Approach" in proceedings of Intl. Conference on Applications of Machine Intelligence and Data Analytics (ICAMIDA 2022), Springer, 22-24 Dec, 2022.

"One person's data is another person's noise." — K. C. Cole

STUDENT ACHIEVEMENTS

R D Lohith, Pranav S S, Manju Swaroop, Amrin Bushra Taj and Sukrutha G of 5th Semester Data Science students selected as "Global Nominee" in the NASA Space Apps Challenge 2022 in the International Hackathon hosted by DSU virtually during Oct 1-2, 2022 and Visited the T-Hub Hyderabad

Bindhu B

Akshaya & Bindhu of 3rd Semester Data Science students have won the 1st place in the **"Diya Designing"** Competition on 21st October 2022 organised by the DataScience@DSU club, Department of Computer Science and Engineering (Data Science).

Akshaya

"Data is the new science. Big Data holds the answers." – Pat Gelsinger

STUDENT ACHIEVEMENTS

Vinuraj Vamshi, Soundarya Jois, Vishal Binil and Dhruthi Purushotham 1st Semester have won the 2nd place in the **"IDEATHON - II"** organised by the DSU X TEMPETE an AI&ML Department Club, Department of Computer Science and Engineering (AI/ML) on 25th November, 2022.

Chethan S

Chethan S of 5th Semester Data Science students have won the 3rd place in the "**Diya Designing"** Competition on 21st October 2022 organised by the DataScience@DSU club, Department of Computer Science and Engineering (Data Science).

Dhanusha R

Dhanusha R, Hrithika N of 5th Semester Data Science students have won the 2nd place in the "**Diya Designing"** Competition on 21st October 2022 organised by the DataScience@DSU club, Department of Computer Science and Engineering (Data Science).

Hrithika N

Gagana Malleshachari

Gagana Malleshachari, Vaibhavi Akshita Reddy of 5th Semester Data Science students have won the 3rd place in the **"Diya Designing"** Competition on 21st October 2022 organised by the DataScience@DSU club, Department of Computer Science and Engineering (Data Science).

Vaibhavi A Reddy

"Torture the data, and it will confess to anything" - Ronald Coase

STUDENT ACHIEVEMENTS

Vinuraj Vamsi, Vishal Binil and Vishanth Rakshitj 1st Semester students have won the 3rd place in the **"Trivia-22"** quiz competition organised by the DSU X TEMPETE an AI&ML Department Club, Department of Computer Science and Engineering (AI/ML) on 15th December, 2022

Sowmya Raj

- **Sowmya Raj** 3rd Semester Data Science student have won the 2nd place in the "Diya Designing Competition on 21st October 2022 organised by the DataScience@DSU club, Department of Computer Science and Engineering (Data Science).
- **Sowmya Raj** 3rd Semester have participated in the "Hackathon" organised by DSU Aerospace Department on 16th November 2022 - 17th November 2022

Vedanth V Baliga

Vedanth V Baliga, Subha Prakash Pattnaik, **Amrin Taj** 2nd prize in **CodifAI ML Competition** organised by AI Works Club, Dept. of CSE (AIML) on 18th November 2022

Amrin Taj

"Data that is loved tends to survive" - Kurt Bollacker

STUDENT ACHIEVEMENTS

Vinuraj Vamsi, Dhruti Purushotham, Vishal Binil and Soundaraya Jois 1st Semester students have won the 2nd place in the **"Young India-Ideathon 2022"** organised by the DataScience@DSU club, Department of Computer Science and Engineering (Data Science) on 10th December, 2022

Badigi Udith Reddy, Srinivas K, Abhishek A 3rd Semester have participated and won the 1st place in the **"Ideastrom at Quantum 22"** organised by New Horizon College of Engineering on 8th December 2022 - 10th December 2022.

EDITORIAL COMMITTEE

Department of Computer Science and Engineering (Data Science)
Dayananda Sagar University
Innovation Campus, School of Engineering
Kudlu Gate, Hosur Road, Bengaluru - 560 068

"It is a capital mistake to theorise before one has data" - Sherlock Holmes

PROGRAMME OUTCOME (PO'S)

- **PO1. Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialisation to the solution of complex engineering problems.
- **PO2. Problem analysis:** Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- **PO3. Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- **PO4. Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
- **PO5. Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
- **PO6. The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
- **PO7. Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
- **PO8. Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
- **PO9. Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
- **PO10. Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
- **PO11. Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
- **PO12. Life-long learning:** Recognise the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

"The world is one Big Data problem" - Andrew McAfee

PROGRAM EDUCATIONAL OBJECTIVES (PEO'S)

- **PEO1.** Possess confident professional engineering skills to build powerful AI models to generate actionable insights, necessary for making data-driven decisions
- **PEO2.** Apply the structured statistical and mathematical methodology to process massive amounts of data in to detect underlying patterns to make predictions under realistic constraints and to visualize the data.
- **PEO3.** Promote design, research, product implementation and services in the field of Data Science and Artificial Intelligence by using modern IT tools.
- **PEO4.** Learn and advance their careers by attaining professional certification and seeking higher education

PROGRAM SPECIFIC OUTCOMES (PSO'S)

- **PSO1.** Apply the knowledge of Mathematics, Science, Big Data Analytics and AI concepts to solve real world business problems under the guidelines of principles of computational intelligence.
- **PSO2.** Inculcate the principles of Data Analysis, Data Warehouse, Analytics, Data visualisation and develop predictive models.

Department of Computer Science and Engineering (Data Science)
Dayananda Sagar University
Innovation Campus, School of Engineering
Kudlu Gate, Hosur Road, Bengaluru - 560 068

"Data are just summaries of thousands of stories" - Chip & Dan Heath