

KL ACCREDITED BY NAAC WITH A++ UNIVERSITY 2024 RANKING RAMEWORK RAMEWORK RANKED 22 UNIVERSITIES 45 YEARS OF EDUCATIONAL

CATEGORY 1

# **DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING**



**Data Science and Big Data Analytics Research Centre** 

### DATA SCIENCE & BIG DATA ANALYTICS RESEARCH CENTRE



#### ABOUT RESEARCH CENTRE

Data Science and Big Data Analytics Research Center is pivotal in advancing the fields of data science, artificial intelligence (AI), and big data analytics. These centers, often affiliated with academic institutions, focus on interdisciplinary research, industry collaboration, and education to address complex challenges.

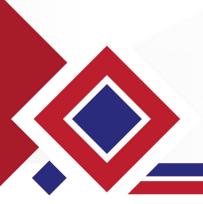
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To become a well-equipped Data Science & Big Data Analytics Research Centre with state of art technologies, to train the students, research scholars and faculty as data scientists who will solve the grand challenges I the field of Data Science and innovate through world-class research to take advantage of these opportunities.



#### MISSION

- 1. To provide a platform to carry out quality research in the field if Data Science, having social and industrial relevance.
- 2. To establish sophisticated lab equipment and related tools in the research center in all the allied research domains of Data Science to achieve 100% financial reliance through industrial consultancy and collaborations by promoting Quality Research.
- 3. To pursue advanced research and development through creative and innovative efforts in terms of quality publications in the field of Data Science Research and allied technologies.
- 4. To provide technical training for students and research faculty community to bridge the gap between Academia and Industry.



### **KEY RESEARCH AREAS**

- 1. The Data Science& Big Data Analytics Research Centre aims to become a national Institute of excellency in 5 years through global networking, high-standard Q1 publications, conducting international conferences and workshops, summer internships for school students, etc
- 2. To promote multidisciplinary research in the fields of Data Science, Big Data Analytics, Artificial Intelligence, Machine Learning and Deep Learning areas.
- 3. To establish collaboration and networking with Industry/institutions (public and private sectors).
- 4. To enable researchers, engineers, and students to transform science and technology into start-ups and build novel patents.

### **EQUIPMENT DETAILS**

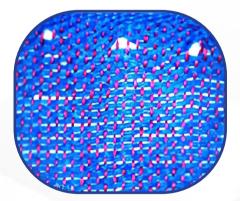
**Project Title:** Identification of Handloom and Power Ioom FABRICS- Developing of Mobile application with Artificial Intelligence



**Electronic Microscope** 



**Digitization Process** 



**Magnified image** 

### **PROMINENT MEMBERS**



Dr. Vijaya Babu Burra, Professor, DSBDA Research Group Head and I/C- DSBDA Research Centre



Dr. A. Senthil Professor & Head, Department of CSE-H



Dr. G. Pradeepini Assoc. Dean Academic Research



Dr. Raja Rajeswari Professor, Alternate HoD



Dr. Tata Ravi Kumar Prof In Charge-Systems and Technology, Data and All Computer Centers



Dr. Vithya Ganesan Professor, Department of CSE-H



Dr. Sagar Imambi Professor, RPAC Chair Person



Dr. K Sathish Kumar Assoc. Professor, Department of CSE-H



Dr. Dinesh Kumar. A Assoc. Professor, EL&GE, Assoc. Dean, R&D



Mr. B Elanegovan Assoc. Professor, Department of CSE-H

## SCHOLARS INFORMATION



#### A. SmithaKranthi

Hybrid Model for Polycystic Ovary syndrome with improved resampling method



#### Komatigunta Nagaraju

Improving Machine Learning Based ASD Diagnosis with Effective Feature Selection



#### **Chopparapu Gowthami**

Comprehensive Approach to Predictive Analysis and Anomaly Detection for Road Crash Fatalities



#### P. Naga Padmavathi

Analysis and Implementation of Scalable Data Integration and Optimized Prediction with Explainable Al for Secure Structural Health Monitoring in Structural Sensor Networks

## HIGHLIGHTS OF RESEARCH CENTER WORKS

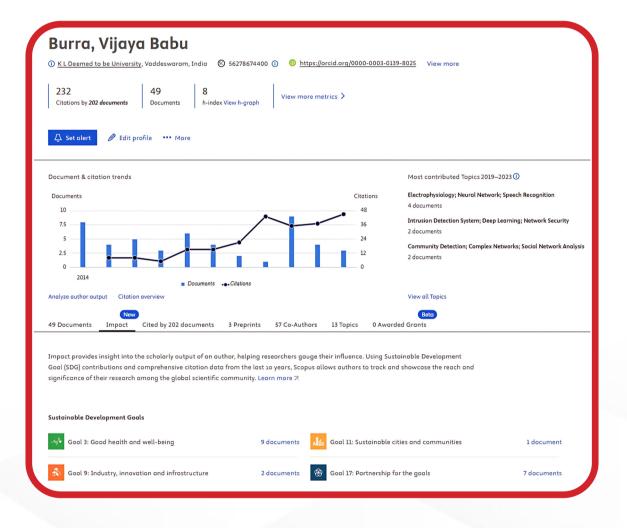


- \* Scalable Big Data Solutions
- \* Advanced Natural Language Processing (NLP)
- \* Al for Social Good

\* Environmental and Climate Science

Data Science& Big Data Analytics Research Centre

### **SDG Goals Related Publications**





Data Science& Big Data Analytics Research Centre

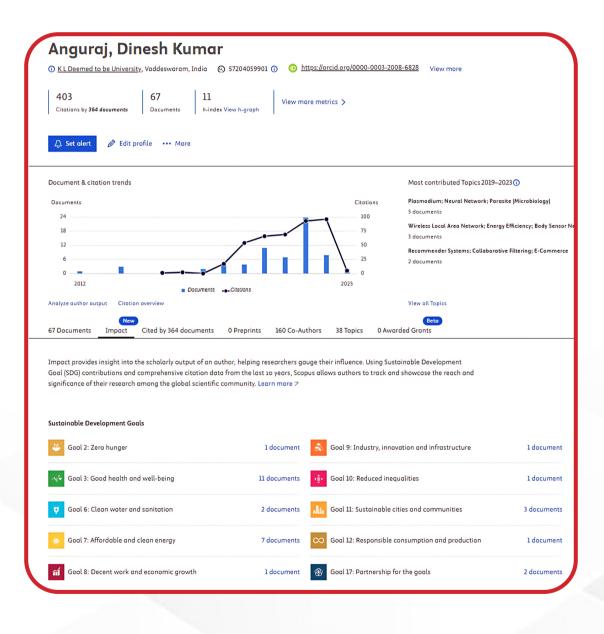
### **SDG Goals Related Publications**

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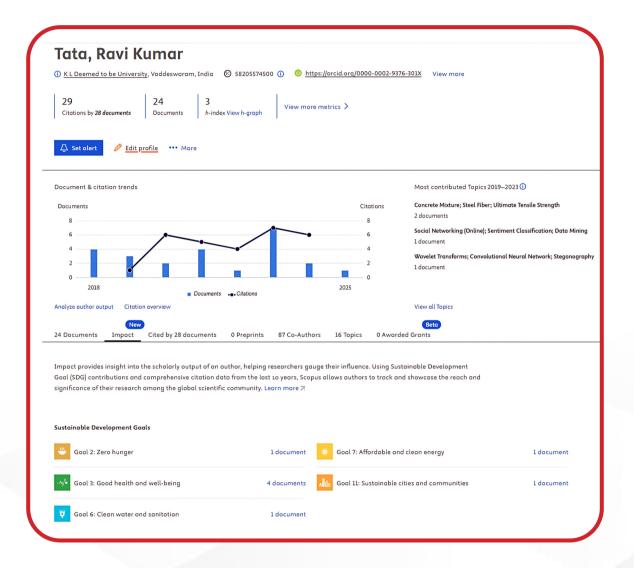
### **SDG Goals Related Publications**

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### **SDG Goals Related Publications**



### **SDG Goals Related Publications**



## SPONSORED PROJECT DETAILS

#### **Project Title**

#### Identification of Handloom and Power Ioom FABRICS- Developing of Mobile application with Artificial Intelligence

#### Sponsored Agency: APCO, GOVt of Andhra Pradesh

#### Team Members :

- 1. Dr. A Senthil, Professor & Head, Department of CSE (Honors)
- 2. Dr. G Pradeepini, Professor, Department of CSE (Honors)
- 3. Dr. K Sathish Kumar, Associate Professor, Department of CSE (Honors)
- 4. Dr. Sagar Imambi, Professor, Department of CSE (Honors)
- 5. Mr. B Elangovan, Assistant Professor, Department of CSE (Honors)

#### **Project Title**

#### Indoor and Outdoor Optimal Path Navigator for visually Challenged People.

#### Sponsored Agency: SERB-DST, Govt of India

<u>Details</u>

Year of Sanction: 2023 Budget/Cost: Rs 18,00000/-Duration: 2 years



### **PROMINENT PUBLICATIONS**

The Research Group Members have published over 250 Research articles mostly indexed in the data bases like SCOPUS/WoS and SCI/UGC approved journals. Some of the notable and recent Research Publications are as follows :

- Indupalli, M.R., Pradeepini, G. Efficient disease identification using symptom-based ensemble models and bayes-search optimization (2024) *Journal of Intelligent and Fuzzy Systems*, 46 (4), art. no. 236137, pp. 9663-9676.
- 2. Pole, G., Gera, P. Incremental Semi-Supervised Approach To Detecting Outliers In Categorical Data (2024) *ICIC Express Letters*, 18 (4), pp. 333-342.
- 3. Kethineni, K., Pradeepini, G.Intrusion detection in internet of things-based smart farming using hybrid deep learning framework,(2024) *Cluster Computing*, 27 (2), pp. 1719-1732.
- 4. Jyothi, P., Pradeepini, G. Heart disease detection system based on ECG and PCG signals with the aid of GKVDLNN classifier, (2024) *Multimedia Tools and Applications,* 83 (10), pp. 30587-30612.
- 5. Pole, G., Gera, P. Combined clustering with classification in a semi-supervised context: An efficient data partitioning (2024) *Journal of Integrated Science and Technology*, 12 (5), art. πo. 824.
- Thandu, A.L., Gera, P. Privacy-Centric Multi-Class Detection of COVID 19 Through Breathing Sounds and Chest X-Ray Images: Blockchain and Optimized Neural Networks (2024) *IEEE Access*, 12, pp. 89968-89985.
- 7. Natha, P., RajaRajeswari, P. Advancing Skin Cancer Prediction Using Ensemble Models (2024) *Computers*, 13 (7), art. no. 157
- Kamble, R., Rajarajeswari, P, Revealing Hidden Patterns: A Deep Learning Approach to Camouflage Detection (2024) International *Journal of Computational Methods and Experimental Measurements*, 12 (1), pp. 97-105.
- Microarray Gene Expression Dataset Feature 9. Krishna, P.R., Rajarajeswari, P. Selection Diagnosis Diseases and Classification with Swarm Optimization to (2024)International Journal of Advanced Computer Science and Applications, 15 (7), 536-546. pp.

## PATENTS

Dept	Name of the Inventor(s)	Name of the Applicant(s)	Title of the patent/ Design	Year	Status	Patent Type
CSE	Bechoo Lal	Bechoo Lal	Moving Image Detection and Recognition System Using Digital Image Processing for lot Environments	2024	Published	Utility
CSE	Dr. Jayavarapu Karthik	Dr. Jayavarapu Karthik	Detection of Cyber Bullying on Social Media Usng Nlachne Learning	2024	Published	Utility
CSE	Dr.iwin Thanakumar Joseph.S	Dr.iwin Thanakumar Joseph.S	Delivering Food And E- Commerce With Antonomous Theft- Proof Robot	2024	Published	Utility
CSE	Dr.iwin Thanakumar Joseph.S	Dr.iwin Thana Kumar Joseph.S	High Decibel Sound Prevention Through The Use of Machine Learning	2024	Published	Utility

## DETAILS OF CONSULTANCY

Name of the faculty consultant or trainter	Organization to which consultancy or corporate training provided	Dates/ duration of consultancy	Amount generated in INR	FY
Dr. K. Swarna	Aqura Infotech	10 Months	40000.00	2019-20
Dr. M. Ramesh Kumar	Giridharvani Industries	3 Months	107000.00	2019-20
Dr. P.lakshmi Prasanna	Fopple Drone Tech Private Limited	10 Months	40000.00	2019-20
Dr. B. V. Appa Rao	Aiboz R & D Private Limited	5 Months	139000.00	2019-20
Dr. Sridevi Emandi	Arete It Service	4 Months	38940.00	2019-20
Dr. T. Pavankumar	Anudotsoft	3 Months	69491.53	2020-21
Dr. Chitta M H Sai Baba	Aqura Infotech	5 Months	33898.31	2020-21
Dr. Tatavarthy Santhi Sri	Calibrage Info Systems Pvt. Ltd.	3 Months	35593.22	2020-21
Dr. Maganti Syamala	Kasturiba Socio & Educational Development	5 Months	33898.31	2020-21
Dr.G. Krishna Mohan	Nagendra And Eswar Services India Pvt. Ltd.	5 Months	42372.88	2020-21
B. Srinivasa Rao	Saanvi Enterprises	5 Months	84745.76	2020-21
Dr. Raju Anitha	Skydrop Techpro Pvt. Ltd.	5 Months	168288.14	2020-21

In an era where information flows ceaselessly and technology evolves at breakneck speed, data science has emerged as a powerful tool for positive change. This field, which combines statistical analysis, computer science, and domain expertise, is revolutionizing how we approach some of the world's most pressing issues. From climate change to healthcare, poverty to education, data scientists are leveraging vast amounts of information to develop innovative solutions and drive meaningful progress.

The following are the few case studies of data science that makes a tangible impact across various sectors, transforming raw data into actionable insights that benefit society.

### **CLIMATE CHANGE**

#### Harnessing Data to Save Our Planet

Climate change stands as one of the most urgent challenges of our time. Data science plays a crucial role in understanding, predicting, and mitigating its effects:

#### **Predictive Modeling for Climate Patterns**

Data scientists are developing sophisticated models that can forecast long-term climate trends with increasing accuracy. By analyzing historical climate data, satellite imagery, and atmospheric measurements, these models help scientists and policymakers anticipate future changes and plan accordingly.

For instance, researchers at the National Center for Atmospheric Research (NCAR) use machine learning algorithms to improve climate models. These enhanced models can better predict extreme weather events, such as hurricanes and droughts, allowing communities to prepare and respond more effectively.

### **Optimizing Renewable Energy Systems**

Data science is instrumental in maximizing the efficiency of renewable energy sources. Through analysis of weather patterns, energy consumption trends, and grid performance, data scientists are helping to optimize the placement and operation of solar panels and wind turbines.

A notable example is the work of the National Renewable Energy Laboratory (NREL). Their data scientists use machine learning to forecast solar and wind power generation, enabling grid operators to integrate these variable energy sources more effectively into the power grid.

### Tracking Deforestation and Biodiversity Loss

Satellite imagery and remote sensing data are being used to monitor deforestation and habitat destruction in real-time. Data scientists process this information to create detailed maps of forest cover change, helping conservationists and policymakers target their efforts more effectively.

Global Forest Watch, an online platform, utilizes machine learning algorithms to analyze satellite imagery and detect forest changes. This tool has been instrumental in identifying illegal logging activities and supporting conservation efforts worldwide.

### HEALTHCARE

#### **Data-Driven Solutions for Better Health Outcomes**

The healthcare sector is experiencing a data revolution, with data science driving improvements in patient care, disease prevention, and medical research:

#### **Early Disease Detection and Prediction**

Machine learning algorithms are being trained on vast datasets of medical records, genetic information, and lifestyle factors to identify early signs of diseases. These predictive models can flag high-risk patients, enabling early intervention and potentially saving lives.

For example, researchers at Mount Sinai Hospital developed a deep learning model called Deep Patient. This model analyzes electronic health records to predict the onset of various diseases, including diabetes, schizophrenia, and certain cancers, with remarkable accuracy.

#### **Personalized Medicine and Treatment Plans**

Data Science enabling the development of personalized treatment plans based on an individual's genetic makeup, lifestyle, and medical history. By analyzing large-scale genomic data and treatment outcomes, data scientists are helping doctors tailor therapies to each patient's unique profile.

The field of pharmacogenomics, which studies how genes affect a person's response to drugs, heavily relies on data science. Companies like 23andMe use machine learning algorithms to analyze genetic data and provide personalized health insights to their customers.

### **Optimizing Healthcare Operations**

Data science techniques are being applied to improve hospital operations, reduce wait times, and allocate resources more efficiently. By analyzing patient flow data, staffing patterns, and equipment usage, healthcare facilities can optimize their processes and improve patient care.

Johns Hopkins Hospital, for instance, developed a data-driven command center that uses predictive analytics to manage patient flow, resulting in reduced wait times and improved bed utilization.

### **POVERTY ALLEVIATION**

#### **Using Data to Target and Measure Impact**

Data science is transforming how we understand and address poverty, enabling more targeted and effective interventions:

#### **Mapping Poverty at High Resolution**

Satellite imagery, mobile phone data, and machine learning are being combined to create detailed poverty maps. These maps help governments and NGOs identify areas of greatest need and allocate resources more effectively.

A groundbreaking study by researchers at Stanford University used machine learning to analyze satellite imagery and predict poverty levels in African countries. This method provides more frequent and granular poverty data than traditional surveys, enabling more timely and targeted interventions.

#### **Improving Financial Inclusion**

Data science is playing a crucial role in expanding access to financial services for underserved populations. By analyzing alternative data sources, such as mobile phone usage and utility bill payments, financial institutions can assess creditworthiness and offer loans to individuals without traditional credit histories.

M-Shwari, a mobile banking service in Kenya, uses machine learning algorithms to analyze mobile money transaction data and determine loan eligibility. This approach has enabled millions of previously unbanked individuals to access credit and savings products.

### **Measuring the Impact of Development Programs**

Data science techniques are being used to evaluate the effectiveness of poverty alleviation programs more accurately. By analyzing large-scale survey data, satellite imagery, and economic indicators, researchers can measure the impact of interventions and identify the most successful strategies.

The Abdul Latif Jameel Poverty Action Lab (J-PAL) uses randomized controlled trials and advanced statistical techniques to evaluate the impact of development programs worldwide. Their data-driven approach has influenced policy decisions and improved the effectiveness of anti-poverty initiatives.

### **EDUCATION**

### Leveraging Data for Personalized Learning

Data science is revolutionizing education by providing insights into student performance, personalizing learning experiences, and improving educational outcomes:

### **Adaptive Learning Platforms**

Data-driven adaptive learning platforms analyze student performance in real-time and adjust the difficulty and content of lessons accordingly. This personalized approach helps students learn at their own pace and focuses on areas where they need the most support.

For example, the online learning platform Khan Academy uses machine learning algorithms to track student progress and recommend personalized learning paths. This data-driven approach has helped millions of students worldwide improve their understanding of various subjects.

### Early Warning Systems for At-Risk Students

Data science is being used to identify students at risk of dropping out or falling behind. By analyzing factors such as attendance, grades, and engagement metrics, schools can intervene early and provide targeted support to students who need it most.

The University of Arizona developed a student success prediction model that uses machine learning to identify at-risk students. This system has helped increase retention rates and improve overall student outcomes.

### **Optimizing Resource Allocation in Education Systems**

Data analytics are helping education administrators make more informed decisions about resource allocation. By analyzing student performance data, demographic information, and funding patterns, school systems can identify areas of greatest need and allocate resources more effectively.

The Los Angeles Unified School District uses data analytics to inform decisions about school funding, program effectiveness, and teacher assignments. This data-driven approach has led to more equitable resource distribution and improved student outcomes.

### **Challenges and Ethical Considerations**

While data science offers tremendous potential for addressing global challenges, it also raises Important ethical and practical considerations:

### **Data Privacy and Security**

As we collect and analyze increasingly large amounts of personal data, ensuring privacy and security becomes paramount. Data scientists must work closely with policymakers and ethicists to develop frameworks that protect individual rights while enabling beneficial research and applications.

### **Algorithmic Bias**

Machine learning algorithms can inadvertently perpetuate or amplify existing biases present in training data. It's crucial for data scientists to be aware of these potential biases and develop methods to detect and mitigate them.

### **Digital Divide**

The benefits of data-driven solutions may not be equally distributed, potentially exacerbating existing inequalities. Efforts must be made to ensure that data science applications are accessible and beneficial to all segments of society. Interpretability and Transparency

As data science models become more complex, ensuring their interpretability and transparency becomes increasingly important. This is particularly crucial in areas like healthcare and criminal justice, where algorithmic decisions can have significant impacts on individuals' lives.

## DETAILS OF RESOURCE PERSONS/ INVITED GUEST LECTURES



Prof Vijaya Babu Burra has attended as Resource Person in TEQIP-II sponsored national level FDP in Sri Vishnu Engineering College for Women, Bhimavaram, Andhra Pradesh



Prof Vijaya Babu Burra has presented a Guest Lecture in SV College of Engineering ,Tirupati, Andhra Pradesh.

## DETAILS OF RESOURCE PERSONS/ INVITED GUEST LECTURES



Prof Vijaya Babu Burra has served as Session Chair in 11th International Conference on Wireless and Optical Communication Networks (WOCN-2014) held during 11th-13th September,2014, in K L University.

### FOR MORE INFORMATION



**Prof. Vijaya Babu Burra,PhD** Research Group Head & In charge-Data Science & Big Data Analytics Research Centre

> email: vijay\_gemini@kluniversity.in Website: https://www.kluniversity.in/





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