



**SRI MANAKULA VINAYAGAR**  
ENGINEERING COLLEGE  
(AN AUTONOMOUS INSTITUTION)



**Department of Information Technology**

**SDS**

**SOCIETY  
FOR DATA  
SCIENCE**

**2023-2024**



**CONSOLIDATED S4DS EVENT REPORT – 2023-24**

**Department of Information Technology – S4DS**

S. No	Date	Title of the Event / Expert Talk	Resource Person(s)	Designation & Organization	Mode
1	27.03.2024	Advanced Computing with Data Science	Dr. TP. Anithaasri	Professor & Head, Dept. Of Cloud Computing , Institute of Computer Science and Engineering, Saveetha School of Engineering SIMATS, Thandalam, Chennai.	Offline

**HoD**



## Department of Information Technology



Two Days Hands-on Training Session on

# Advanced Computing with Data Science

## About SMVEC

Sri Manakula Vinayaga Educational Trust was founded to provide quality and affordable education to the weaker sections of society. The trust established **Sri Manakula Vinayagar Engineering College (SMVEC)** in 1999. SMVEC is an autonomous institution affiliated to Pondicherry University. It offers a variety of undergraduate, postgraduate, and research programs in engineering, arts, science, and allied health sciences.

## Vision

- To be recognized globally for providing high-quality education, innovation, and research.
- To transform lives and serve society.

In other words, the institution wants to be known for providing excellent education that will help students develop their skills and knowledge. They also want to be known for their research and innovation, which will help them make new discoveries and solve problems. Ultimately, they want to use their **education, innovation, and research** to make a positive impact on the world.

## Mission

The institution aims to provide:

- **Quality education** that combines cutting-edge technologies with best practices.
- **Research and innovation** that is value-based and collaborative with industries and institutions around the world.
- **Employability and entrepreneurship** skills through value and skill-based training.
- **Ethical values** that blend societal righteousness with academic professionalism.

In other words, the institution wants to provide students with a well-rounded education that will prepare them for success in the workforce and in life. They want to encourage students to be creative and innovative, and to use their skills to make a positive impact on the world. They also want to instill in students a strong sense of ethics and morality.

## Accreditations





## Department of Information Technology

In Association with



S4DS STUDENTS CHAPTER

Organizes Two days Hands on Training in

# Advanced Computing with Data Science

27th and 28th March 2024 , 10:00 am at Conference Hall

The Management, Director cum Principal, Deans, HoDs and Faculty members cordially invite you all for the Training Session.

### Resource Person

**Dr. TP. Anithaashri**

Professor & Head  
Dept. Of Cloud Computing  
Institute of Computer Science and Engineering  
Saveetha School of Engineering  
SIMATS, Thandalam, Chennai.

### Presides

**Shri. M. Dhanasekaran**

Chairman and Managing Director, SMVET,  
Chancellor Takshashila University

### Felicitates

**Dr. K. Narayanasamy**

Secretary, SMVE Trust

**Shri. D. Rajarajan**

Treasurer, SMVE Trust

**Dr. V.S.K. Venkatachalapathy**

Director cum Principal

**Dr. R. Raju**

HOD - IT  
Convener

A Stimulating place to learn and practice technology.

# ADVANCED COMPUTING WITH DATA SCIENCE

## DAY -1



## **Introduction:**

In today's data-driven world, the ability to extract meaningful insights from vast amounts of data is paramount for businesses and organizations to stay competitive and make informed decisions. Data science, with its interdisciplinary approach and powerful tools, has emerged as a crucial discipline for unlocking the potential of data. Our two-day workshop aims to provide participants with a comprehensive understanding of data science fundamentals and practical applications, with a special focus on TensorFlow—a leading platform for machine learning and deep learning. Led by an expert in advanced computing, the seminar offers an immersive learning experience, culminating in hands-on sessions to empower participants with the skills and knowledge needed to harness the power of data and TensorFlow.

## **Day One: Foundations of Data Science**

### **Introduction to Data Science:**

- Definition and Scope: Understanding data science as an interdisciplinary field that combines domain knowledge, statistics, and computer science to extract insights from data.
- Importance and Applications: Exploring how data science is revolutionizing industries such as healthcare, finance, e-commerce, and marketing through predictive analytics, pattern recognition, and optimization.
- Career Opportunities: Discussing the diverse roles available in data science, including data analysts, data engineers, machine learning engineers, and data scientists, and the skills required for each role.

### **Understanding Data:**

- Data Types and Sources: Exploring different types of data (structured, unstructured, semi-structured) and common sources such as databases, APIs, and sensor data.
- Data Collection and Preprocessing: Learning about data collection methods, data cleaning, and data wrangling techniques to ensure data quality and suitability for analysis.
- Exploratory Data Analysis (EDA): Introduction to EDA techniques such as summary statistics, data visualization, and correlation analysis to gain insights and identify patterns in data.

### **Practical Data Manipulation with Python:**

- Introduction to Python Libraries: Overview of essential Python libraries for data manipulation, including Pandas for data frames and NumPy for numerical computations.
- Hands-on Exercises: Participants engage in hands-on exercises to import datasets, perform data cleaning operations, and conduct basic exploratory data analysis using Pandas and NumPy.



### **Ethical Considerations in Data Science:**

- Privacy and Security: Discussing the importance of data privacy and security measures to protect sensitive information and ensure compliance with regulations such as GDPR and HIPAA.
- Bias and Fairness: Examining the ethical implications of algorithmic bias and fairness in data-driven decision-making, and strategies to mitigate bias in model development and deployment.

### **Case Studies and Guest Speakers:**

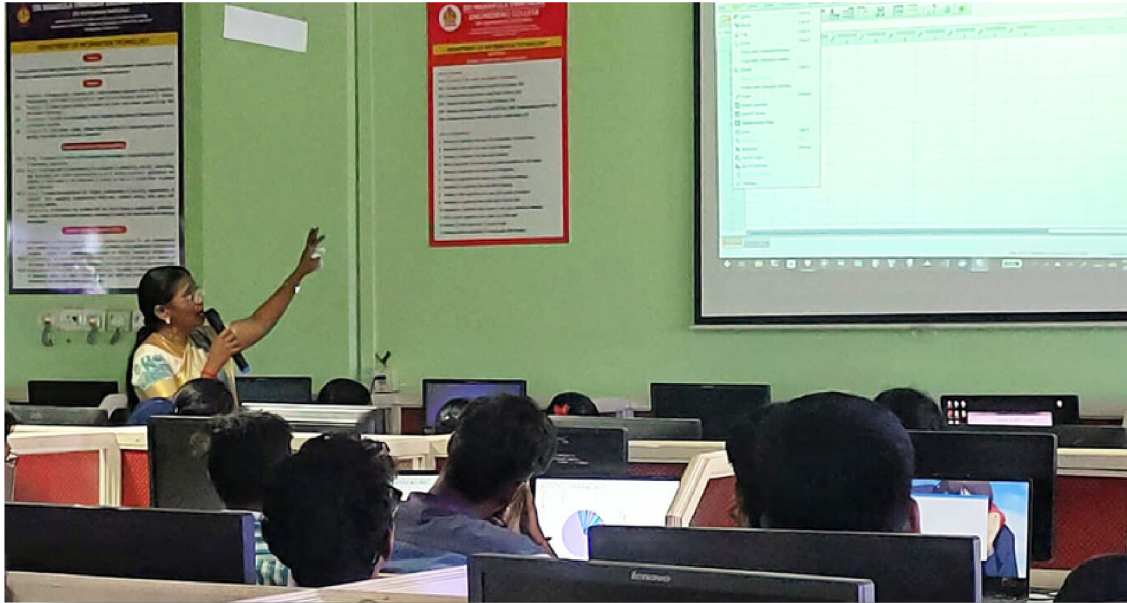
- Real-World Examples: Analyzing case studies from various industries to illustrate the practical applications of data science in solving business problems and driving innovation.
- Guest Speakers: Inviting industry experts to share their experiences and insights on the challenges and opportunities in the field of data science, and to provide career advice and guidance to participants.

### **Conclusion:**

As day one of the workshop concludes, participants leave with a solid foundation in data science fundamentals. Equipped with knowledge of data manipulation techniques, exploratory data analysis, and ethical considerations, attendees are prepared to dive deeper into the practical applications of data science on day two.

# ADVANCED COMPUTING WITH DATA SCIENCE

## DAY - 2



## Day Two: Deep Dive into TensorFlow and Practical Applications

### Introduction:

Building upon the foundational knowledge gained on day one, day two of the workshop focuses on practical applications of data science, with a special emphasis on TensorFlow—a powerful open-source platform for machine learning and deep learning. Participants will embark on a journey to explore the capabilities of TensorFlow through hands-on exercises, guided tutorials, and interactive demonstrations. With a combination of theory and practical implementation, attendees will deepen their understanding of TensorFlow and gain valuable experience in building and deploying machine learning models.

### Exploring TensorFlow:

- Introduction to TensorFlow: Origins, Features, and Applications: Participants will gain insights into the history and evolution of TensorFlow, its key features, and its wide-ranging applications in machine learning, deep learning, and artificial intelligence.
- TensorFlow Basics: Understanding TensorFlow's computational graph architecture, tensors, operations, and sessions, and how they facilitate efficient computation and model training.
- TensorFlow Ecosystem: Exploring TensorFlow's ecosystem of libraries and tools, including TensorFlow Extended (TFX) for end-to-end ML pipelines, TensorFlow Lite for mobile and embedded devices, and TensorFlow.js for web-based applications.

### Building and Training Neural Networks with TensorFlow:

- Overview of Neural Networks: Understanding the basic building blocks of neural networks, including neurons, layers, activation functions, and loss functions.
- Building Neural Networks with TensorFlow: Participants will learn how to construct neural networks using TensorFlow's high-level APIs, such as Keras, and gain hands-on experience in building various architectures, including feedforward, convolutional, and recurrent neural networks.
- Training Neural Networks: Exploring the process of training neural networks using gradient descent optimization algorithms, backpropagation, and techniques for improving convergence and avoiding overfitting.

### Advanced Topics in TensorFlow:

- Deep Reinforcement Learning: Introduction to deep reinforcement learning algorithms, such as deep Q-learning and policy gradients, and their applications in autonomous agents and game playing.

### **Practical Applications and Hands-On Labs:**

- Real-World Projects: Participants will work on real-world projects using TensorFlow, applying their knowledge to solve practical problems such as image classification, text generation, and time series forecasting.
- Hands-On Labs: Guided by experienced instructors, attendees will engage in hands-on labs to experiment with TensorFlow, explore different model architectures, and fine-tune hyperparameters for optimal performance.

### **Data Sets and Resources:**

- Data Sets: Introduction to sources of datasets for machine learning projects, including popular platforms such as Kaggle, UCI Machine Learning Repository, and Google Dataset Search. Participants will learn how to search for and download datasets for their projects, and gain insights into data preprocessing and feature engineering techniques.

### **Deployment and Scaling of TensorFlow Models:**

- Model Deployment: Exploring different deployment options for TensorFlow models, including serving models via TensorFlow Serving, deploying models as RESTful APIs using Flask or FastAPI, and deploying models to cloud platforms such as Google Cloud AI Platform or AWS SageMaker.
- Model Scaling: Understanding techniques for scaling TensorFlow models to handle large datasets and high-throughput inference, including distributed training with TensorFlow's distributed computing framework and model parallelism.



### **Conclusion:**

As day two of the workshop draws to a close, participants depart with a wealth of practical knowledge and hands-on experience in TensorFlow. From building and training neural networks to exploring advanced topics such as reinforcement learning and GANs, attendees are equipped to tackle real-world challenges and leverage the power of TensorFlow to drive innovation and create impactful solutions. Additionally, armed with knowledge of data sources and resources, participants are empowered to continue their data science journey beyond the workshop, exploring new datasets and projects with confidence.



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