HINDUSTHAN INSTITUTE OF TECHNOLOGY
(An Autonomous Institution)
(Approved by AICTE, New Delhi, Affiliated to Anna University, Chennai,
Accredited with "A" Grade by NAAC and Accredited by NBA (Aero, CSE, ECE, IT & MECH.)
Valley Campus, Pollachi Main Road, Coimbatore 641 032.

MULTIMEDIA AND VISUALIZATION PEDAGOGY REPORT

Pedagogy Type: Multimedia and Visualization

Activity Title: Interactive Learning using Google Colab

Course: 22AD405–Machine Learning

Faculty Name: Ms. N. Abinaya, Assistant Professor, CSE

Class / Section: III Year – CSE – Section C

1. Objective of the Pedagogy

- To demonstrate Dimensionality Reduction and Principal Component Analysis (PCA) using real datasets.
- To introduce Transfer Learning concepts through pre-trained models.
- To apply Machine Learning techniques for Disease Diagnosis use cases.
- To enhance analytical and implementation skills using interactive coding environments.

2. Description of the Activity

As part of the Multimedia and Visualization pedagogy, Google Colab was used to teach Dimensionality Reduction, PCA, Transfer Learning, and Disease Diagnosis concepts. Colab provided an interactive, cloud-based environment where students could visualize data, execute code, and observe model behavior in real time.

Students explored high-dimensional datasets and applied Dimensionality Reduction techniques to visualize feature space effectively. PCA was demonstrated to show variance maximization and feature transformation. Transfer Learning concepts were introduced using pre-trained deep learning models, highlighting feature reuse and fine-tuning. Disease Diagnosis case studies were implemented to connect Machine Learning techniques with real-world healthcare applications.

Guided students through notebooks, explained visual outputs such as plots and accuracy metrics, and facilitated discussions linking theory with practical implementation.

Activity Coverage:

- Dimensionality Reduction techniques
- Principal Component Analysis (PCA)
- Transfer Learning using pre-trained models
- Disease Diagnosis using Machine Learning models

3. Tools and Platforms Used

Tool / Platform	Purpose
Google Colab	Interactive coding and visualization
Python Libraries (NumPy, Pandas, Scikit-learn, TensorFlow/PyTorch)	Model implementation and analysis
Laptop / Mobile Devices	Accessing Colab notebooks
Projector / Smart Board	Live code demonstration and visualization
Classroom Discussion	Concept clarification and interpretation by Students

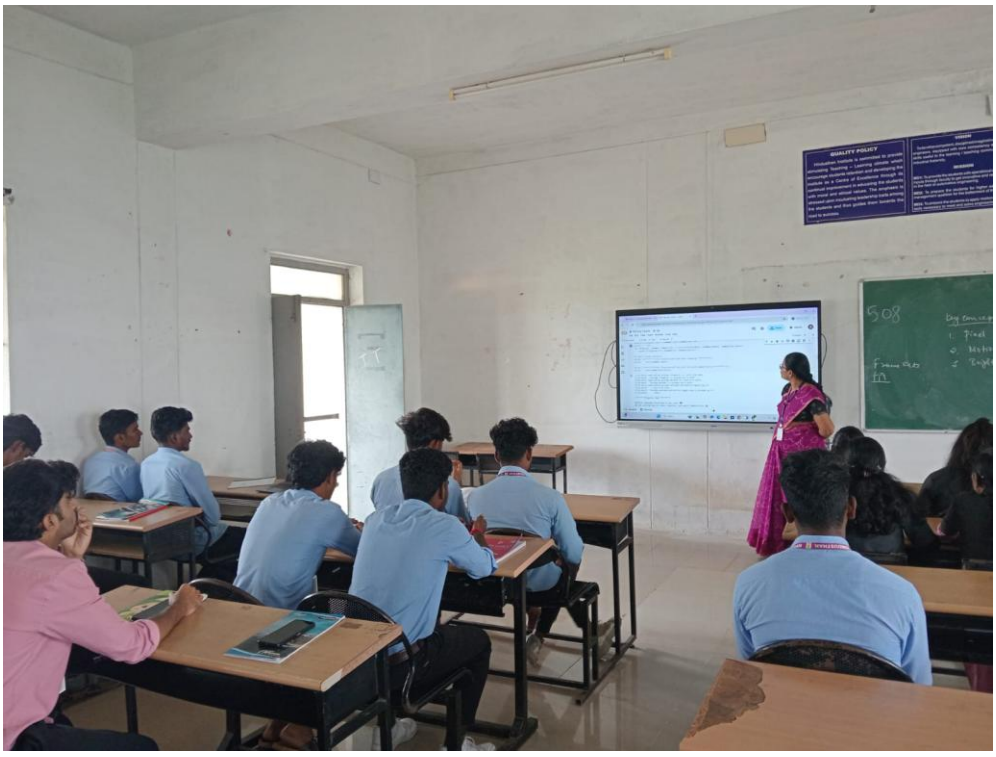
4. Course Outcome Mapping

CO	Statement	Mapped POs	Mapped PSOs	Justification
CO3	Apply dimensionality reduction techniques and PCA to analyze high-dimensional data for effective model design.	PO3, PO5	PSO1, PSO2	This activity supports PO3 by enabling effective model design and analysis, and PO5 through the use of modern Machine Learning tools and visualization platforms, while strengthening PSO1 and PSO2 via programming and data analysis skills.
CO5	Analyze real-world applications of Machine Learning considering ethical and societal implications.	PO8	-	This activity aligns with PO8 by emphasizing ethical considerations such as data privacy, bias, reliability, and responsible use of intelligent systems, while applying domain knowledge and computational techniques.

5. Learning Outcomes

- Students developed strong practical understanding of Dimensionality Reduction and PCA.
- Improved ability to use Transfer Learning for real-world problems.
- Enhanced understanding of Machine Learning applications in Disease Diagnosis.
- Strengthened coding, visualization, and analytical skills using Google Colab.
- Improved confidence in implementing industry-relevant Machine Learning workflows.

6. Proof of Implementation



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