NARASARAOPETA ENGINEERING COLLEGE

(AUTONOMOUS)

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

2024-2025

BATCH NUMBER	DB6
TEAM MEMBERS	Gandikota Narendra (21471A05M4) Katta Subbarao (21471A05P0) Nallabothu Narendra (21471A05P7)
GUIDE	K.V.Narasimha Reddy
TITLE	Advanced Techniques in Deep Learning for Pancreatic Cancer Detection and Classification
DOMAIN/TECHNOL OGY	DEEP LEARNING
BASE PAPER LINK	https://ieeexplore.ieee.org/document/10287872
DATASET LINK	https://drive.google.com/drive/folders/1hpjCAuNCcZUyYZsFjdti9MDulgSF0yeh?usp=sharing https://www.kaggle.com/datasets/jayaprakashpondy/pancreatic-ct-images
SOFTWARE REQUIREMENTS	Browser: Any latest browser like Chrome Operating System: Windows 7 Server or later Python (COLAB)
HARDWARE REQUIREMENTS	Processor: Intel® Dual Core 2.0GHz minimum Hard Disk: 1TB minimum RAM: 8GB or more

ABSTRACT	This paper presents advanced deep learning techniques for pancreatic cancer detection and classification from medical images with a specific focus on the hybrid architecture of InceptionDense. The com bined paradigm retains the strengths of InceptionV3 and DenseNet121 through optimized convolutional channels with diversified scales in fea tured descriptions, which plays an influential role in the identification of tumours that vary in sizes and shapes. This dense connectivity in DenseNet121 promotes the reuse of features, hence enhancing the model capability to make differences in the middle of cancerous and non-cancerous cases. The study used a dataset of 1,411 annotated CT images obtained from Kaggle with balanced training and testing sets. Key hyperparame ters included a fixed learning rate of 0.0001 with binary cross-entropy loss function and Adam optimizer, training over 10 epochs. Using accuracy, precision, recall, F1-score, specificity, and R^2 score as evaluation met rics, InceptionDense had 99.75% accuracy while SSA with Stacked Deep Learning observed 99.26% only. Multi-scale feature extraction along with dense connectivity improved detection capabilities that were significantly high. This work aims to improve the diagnostic reliability of medical imaging. Its early diagnosis and treatment, aided by healthcare profes sionals, will actually improve outcomes for patients with pancreatic can cer. Future research will be focused on validating these methods with larger datasets and extending them to other imaging modalities, includ ing MRI and ultrasound, in the hopes of furthering clinical applicability.

Signature of the student(s) **Signature of the Guide** **Signature of the project coordinator**