NARASARAOPETA ENGINEERING COLLEGE (AUTONOMOUS)

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

2024 - 2025

Batch Number	BB2
Team Members	Tata Sumanth (21471A05D2) Katragadda Somnath (21471A0596) Laghumavarapu Venkata Pavan Kumar (21471A05D7) Lingala Brahmaiah (21471A05A0)
Guide	Dr. Sireesha Moturi M.Tech, Ph.D.
Title	CNN-Driven Detection of Abnormalities in PCG Signals Using Gammatonegram Analysis
Domain/Technology	DEEP LEARNING
Base Paper Link	https://doi.org/10.1109/AISP57993.2023.10134986
Dataset Link	https://www.kaggle.com/datasets/brundavanamsatyasai/gammatone-images-of-heart-sounds
Software Requirements	Browser: Any latest browser like Chrome Operating System: Windows 10 Server or later Python (COLAB)
Hardware Requirements	System Type: Intel Core i5 or above RAM: 8 GB Number of cores:5 Number of Threads: 4
Abstract	Phonocardiogram (PCG) signals carry essential data about heart health, offering significant potential for early disease detection. This study presents a method to identify heart abnormalities using Gammatonegram images derived from PCG signals, which are analyzed with a Convolutional Neural Network (CNN). The Gammatonegram, a time-frequency representation mimicking human auditory processing, captures both temporal and spectral features of PCG signals. The images are preprocessed through resizing and data augmentation, the images are input into the CNN model for classification. The model distinguishes between healthy and unhealthy heart sounds, and its performance is evaluated using several optimizers—SGD, Adagrad, Adadelta, RMSprop, and Adam. Adam yielded the best performance, achieving a test accuracy of 100%. This method provides a robust, non-invasive solution for heart disease diagnosis, leveraging deep learning to improve accuracy in detecting heart abnormalities from PCG signals.

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