



Jyothi Engineering College
NAAC Accredited College with NBA Accredited Programmes*

Approved by AICTE & affiliated to APJ Abdul Kalam Technological University

A CENTRE OF EXCELLENCE IN SCIENCE & TECHNOLOGY BY THE CATHOLIC ARCHDIOCESE OF TRICHUR

JYOTHI HILLS, VETTIKATTIRI P.O, CHERUTHURUTHY, THRISSUR. PIN-679531 PH : +91- 4884-259000, 274423 FAX : 04884-274777



NBA accredited B.Tech Programmes in Computer Science & Engineering, Electronics & Communication Engineering, Electrical & Electronics Engineering and Mechanical Engineering valid for the academic years 2016-2022. NBA accredited B.Tech Programme in Civil Engineering valid for the academic years 2019-2022.

Group No: 18

Cardiovascular Diagnosis Using Federated Learning

Department of CSE

Jyothi Engineering College

Thrissur

October 8, 2020



Team Members

1. ANN MARIYA
2. RAHUL M
3. MANEESH MANOJ
4. RASHI M

JEC16CS026
JEC16CS092
JEC17CS063
JEC17CS079

Mentor

Ms. Namitha T N

Assistant Professor, CSE



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Vision of the Department

- Creating eminent and ethical leaders in the domain of Computational Sciences through quality professional education with a focus on holistic learning and excellence.

Mission of the Department

- To create technically competent and ethically conscious graduates in the field of Computer Science and Engineering by encouraging holistic learning and excellence.
- To prepare students for careers in Industry, Academia and the Government.
- To instill Entrepreneurial Orientation and research motivation among the students of the department.
- To emerge as a leader in education in the region by encouraging teaching, learning, industry and societal connect.



Introduction

- Cardiovascular diseases are the number 1 cause of deaths globally as per WHO
- Heart sound proves to be a proper diagnostic for detecting abnormalities in the Cardiovascular system
- Electronic stethoscope records the patient's heart sounds
- Classifying the sound into various categories using Machine Learning
- Federated learning based training methodology that could handle sensitive data for the requirement



Objectives

- Easy diagnosis of Cardiovascular conditions
- Implement a privacy oriented approach over the conventional Machine Learning systems
- Implement Federated Learning in the healthcare sector



Problem Statement

“Cardiovascular diseases stand as the number one cause of death globally, diagnosing the same is a complicated task. Because of data-privacy restrictions, conventional Machine Learning based technologies are not able to achieve the level of accuracy, comparable to a human counterpart”



Area of the Project

● Artificial Intelligence:

Artificial intelligence (AI), sometimes called machine intelligence, is intelligence demonstrated by machines, unlike the natural intelligence displayed by humans and animals.



Skill sets Required for the Project

1. Machine Learning Fundamentals
2. Tensorflow
3. Federated Computation
4. Cloud Computing
5. Sound data Manipulation



Conclusion

- We develop a Federated Learning based system that could help Doctors easily diagnose Cardiovascular conditions using sound recorded from Electronic Stethoscope



Seminar Topic: MANEESH MANOJ - JEC17CS063

“Analysis and Classification of Lung and Heart sounds”

Heart and lung sound that are heard using a stethoscope are the result of mechanical interactions that indicate operation of cardiac and respiratory systems, respectively. There are certain characteristics relevant that are useful to detect common respiratory and cardiovascular conditions

Base Paper:

“Lung and Heart Sounds Analysis: State-of-the-Art and Future Trends”

- A.L. Padilla-Ortiz & David Ibarra



Seminar Topic: RASHI M - JEC17CS079

“Federated Learning: Communication Model”

Federated Learning is a machine learning setting where the goal is to train a high-quality centralized model with training data distributed over a large number of clients each with unreliable and relatively slow network connections. The topic discusses about the different communication model and their efficiency.

Base Paper:

“Communication-Efficient Learning of Deep Networks from Decentralized Data”

- H. Brendan McMahan, Eider Moore, Daniel Ramage, Seth Hampson, Blaise Aguera y Arcas



Seminar Topic: ANN MARIYA - JEC16CS026

“COMPUTER AIDED AUSCULTATION - ELECTRONIC STETHOSCOPE”

This paper provides an in-depth study of the electronic stethoscope technology, the methodology for diagnosis of cardiac disorders based on computer-aided auscultation, smartphone stethoscope apps. It covers every key component of the computer-aided system with electronic stethoscope, from sensor design, front-end circuitry, denoising algorithm, heart sound segmentation, to the final machine learning techniques.

Base Paper:

“The Electronic Stethoscope”

- Shuang leng, Ru San Tan, Chao Wang, Kevin Tshun Chuan Chai,
Dhanjoo Ghista, Liang Zhong



Seminar Topic: RAHUL M - JEC16CS092

“5G Wireless Systems”

5G technology has changed the means to use cell phone within very high bandwidth. The 5G technologies include all type of advanced features which makes 5G technologies most powerful and in huge demand in near future.

Base Paper:

“Revolution in telecommunication”

- Amit Kumar Jain, Rupesh Acharya, Saroj Jakhar, Tarun Mishra



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Thank You!