# ML/DL based biomedical signal analysis and processing for disease identification and related hardware implementation

Archana Kumari & Shwashwat Das

Supervisor
Prof. Sumitra Mukhopadhyay

Institute of Radiophysics and Electronics
University of Calcutta

September 6, 2023

# Agenda

- Introduction

- Goals

- Non Goals

- Learnings

- Future Updates

- References

# Introduction

**Biomedical Signal Analysis**

- ML/DL techniques to process and interpret biomedical signals, aiding in the identification and monitoring of diseases.

- This will offer early diagnosis and personalized treatment opportunities.

# Goals

- Data Collection from some hospital
- Preprocessing of the obtained data
- Feature Extraction
- ML/DL Model Training
- Validation
- Disease Identification
- Integration with the hardware

# Streched Goals

- Biomedical Signal Conditioning
- Further optimize the algorithm in terms of memory consumption and its time complexity

# Learnings

- Learn the broad types of ML techniques (Unsupervised Learning, Reinforcement Learning, Regression, Classification Learning)
- Learn about Evaluation and Cross-Validation
- Learn the concepts of Linear Regression, Decision Tress and Over-fitting
- Learn the KNN algorithm
- Created the repo and updated it with the current progress

# Future Updates

- Learn the next module of NPTEL.
- Set up the hardware
- Implement the models on hardware parallely

# References

- NPTEL Playlist1 - https://onlinecourses.nptel.ac.in/noc23$_c$s18/$preview$
- NPTEL Playlist2 - https://archive.nptel.ac.in/courses/106/105/106105152/
- Link to Dataset used for learning - https://www.kaggle.com/datasets/kaushil268/disease-prediction-using-machine-learning?resource=download
- Link to Project's Public Repo - https://github.com/archana-9430/Final-year-project-Biomedical-Signal-Analysis/blob/main/Presentation/Presentation-1.tex

Thank you

# Appendix