

ECG SIGNAL CLASSIFICATION

VIA

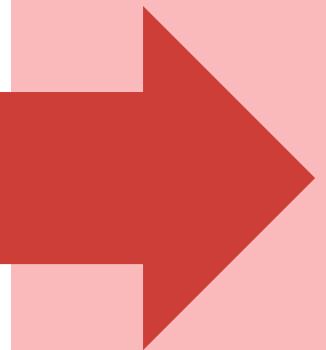
FOURIER TRANSFORMS

The role of
electrocardiograms (ECGs)

Author: Calvin Chan

Benefits of ECGs

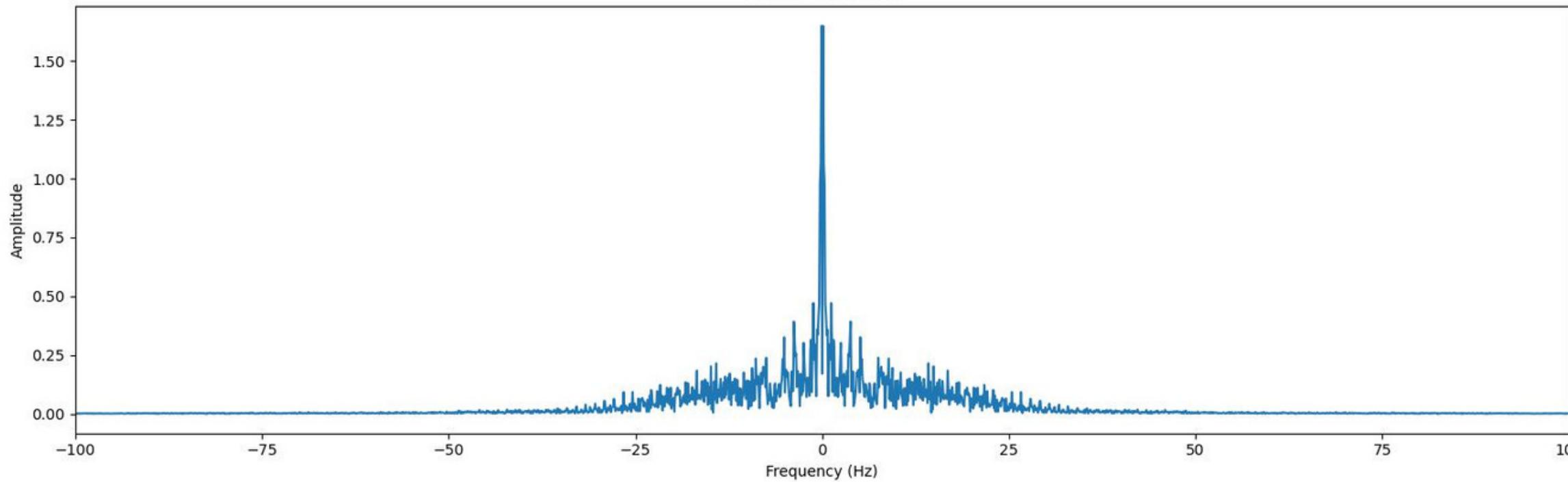
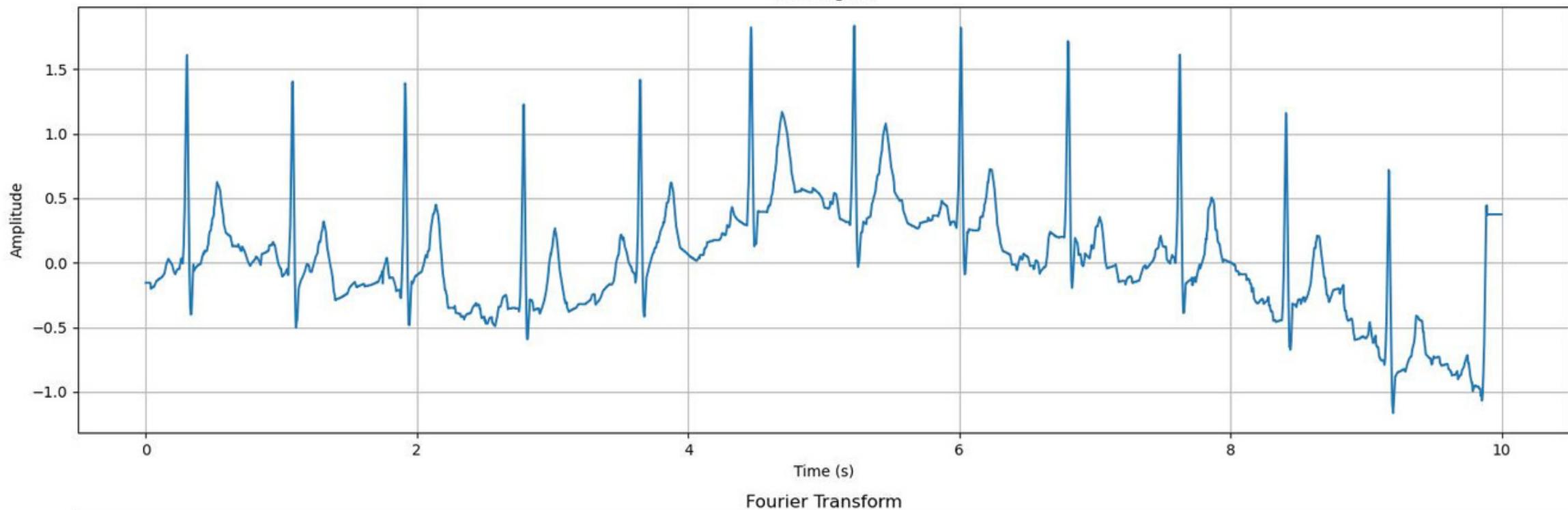
- Assessing heart function
- Detecting heart abnormalities
- Diagnosing cardiac conditions



Problem & Solution

- Traditionally ECG readings rely on human interpretation
- Inaccurate readings can lead to poor treatment outcomes
- Propose to use data science models to help with diagnosis

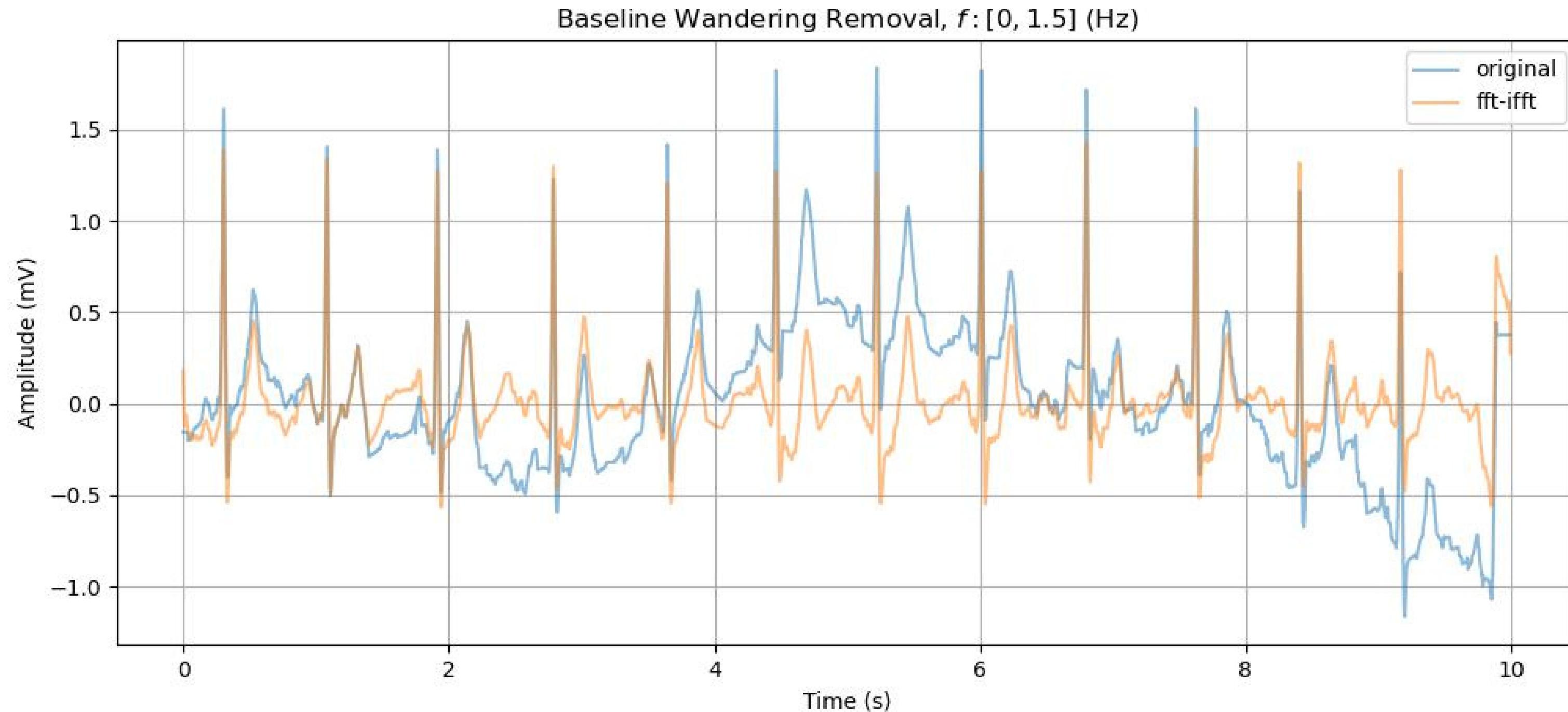
Record 00001_hr Lead II
ECG Signal



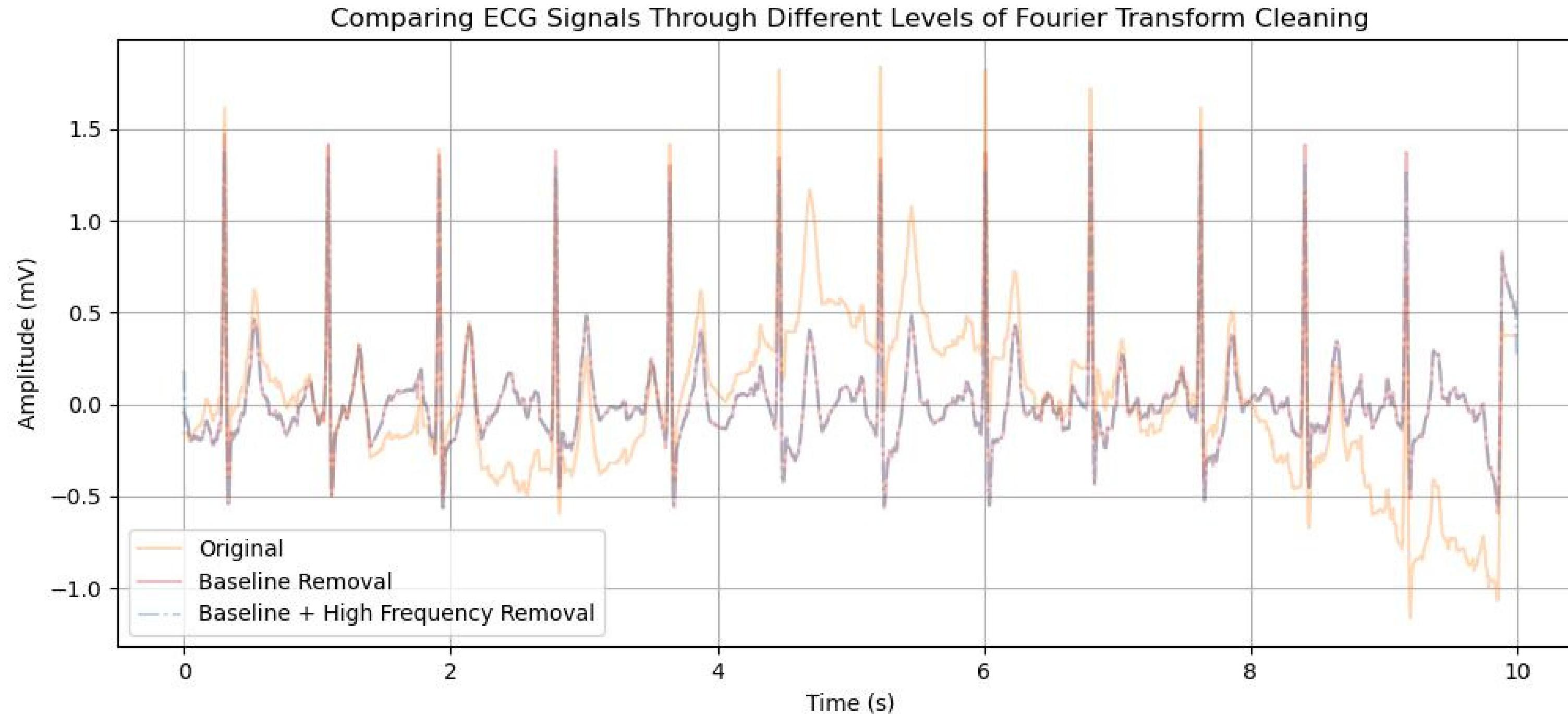
PTB-XL – PhysioNet

- Data set containing 21799 ECG records
 - Reduced down to ~15000
- Five diagnostic classes (NORM, HYP, MI, CD, STTC)
 - Signals can show more than one class
- Cleaning through Fourier Transforms

Fourier Transform Cleaning



Fourier Transform Cleaning

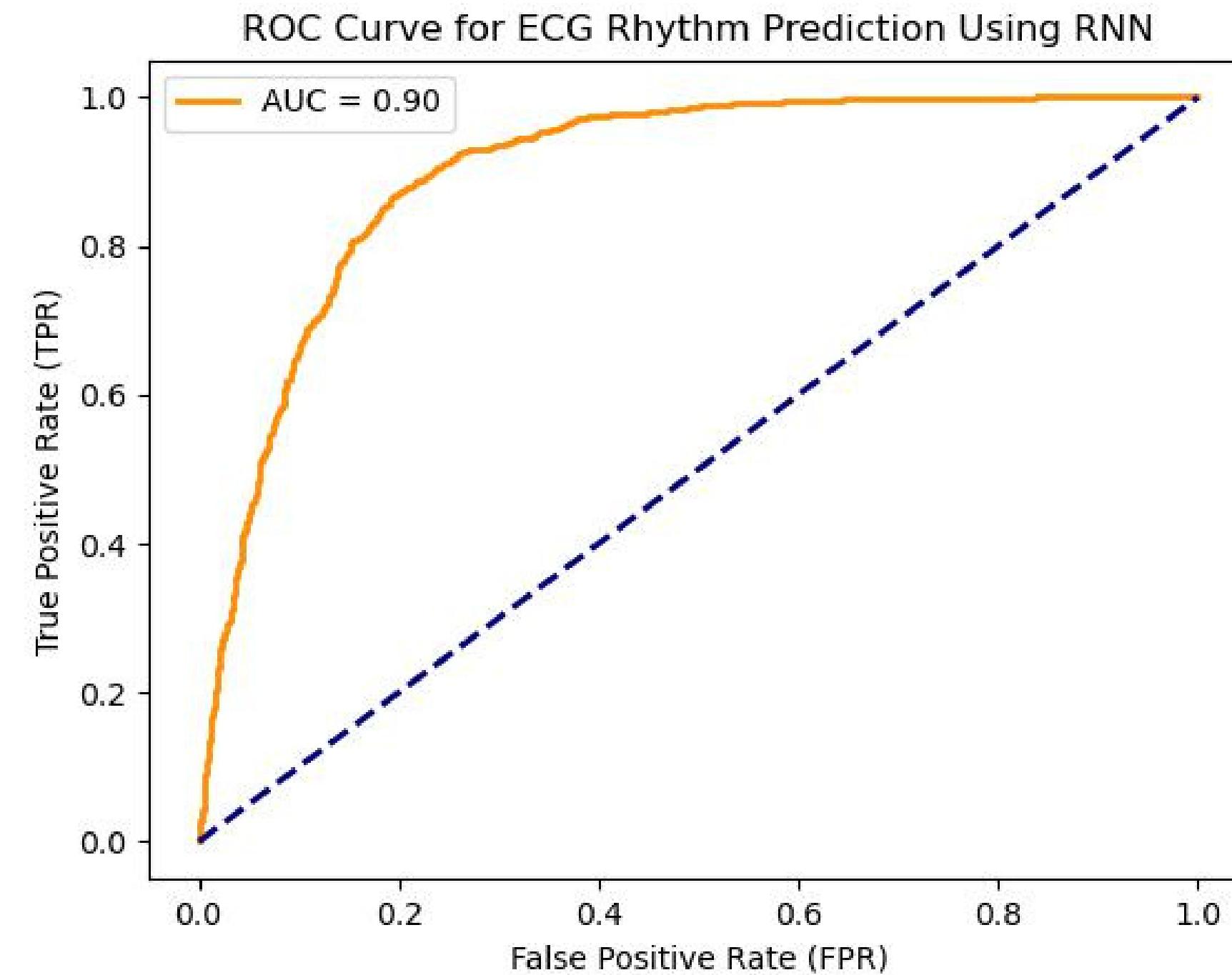


ADVANCED MODELING

Recurrent Neural Networks

Model Evaluation

- **~3000 parameters/weights**
- **Binary Classification**
- **Accuracy**
 - **Training : 80.6 %**
 - **Testing : 80.1 %**
- **Recall score**
 - **Abnormal : 88 %**



Next Step : StreamLit

- Designing a web-app showcasing thought process of the model
- Demoing product through sample signal, given basic biometric data (e.g. age, weight, height)

THANK YOU!