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*Enhancing the detection of Atrial Fibrillation from existing models using Persistent Homology-based feature.*

Atrial Fibrillation is an irregular heartbeat that leads to blood clots, heart failure, and other heart-related complication. It is difficult to detect and diagnose because symptoms can come and go on their own. In respond the PhysioNet/Computing in Cardiology challenge focus to make a model that will help differentiation Atrial Fibrillation using variety of tradition and novel methods. It is possible to take the winning and losing models and modify them to better differentiation Atrial Fibrillation. Incorporate Persistent Homology-based feature to these models will help look at the data set in a different perspective. This method provides a strategy for constructions the topological information of point cloud data. The typical output of persistent homology are persistent barcodes and persistent diagrams. Persistent barcodes provide crucial information, each bar represents a persistent feature and for one point cloud the persistent barcodes of each dimensional hole are generated. It has been shown that implementing this method has significant enhance the detection of some of the model. By comparing the Persistent Homology-based for both datasets of regular heart rhythm and Atrial Fibrillation it is easy to diagnose the condition and give the appropriate medications. (Received September 26, 2018)