The diffusion Frechet function (DFF) provides a means of comparing graphical networks. With nodes obtaining lower DFF values playing more essential roles in the whole network, the DFF is known to exhibit stability in capturing network features. We apply this technique to compare and classify electrocardiogram (ECG) waveforms. In effort to distinguish data from patients that experience a type of cardiac event from those who do not, we first transform each ECG signal into a network. We then use the DFF method in conjunction with the random forest classification algorithm to capture the network’s distinguishing attributes and predict whether a patient is susceptible to a cardiac event. This talk presents a brief overview of the DFF, our ECG network construction, as well as the results of our ECG classification experiments. (Received September 16, 2019)