4-Quadrant interpretation of the Speed Spot Plot Asymmetry for Arrhythmia Detection

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Today, The World Health Organization estimates that by 2030, about 25 million people will die from cardiovascular disease every year, meaning that heart disease will remain the leading cause of death. One of the most common types of cardiovascular disease is arrhythmia caused by abnormal electrical activity in the heart. An effective method for studying the nonlinear characteristics of HRV on an ECG, in particular arrhythmias, is the Poincaré Plot - a diagram in which each R-R interval is displayed as a function of the previous R-R interval. This work is a continuation of studies of a modified graphical method for displaying HRV, called Speed Spot, in which both the current value of the rhythm and the rate of its change are graphically displayed. In particular, the asymmetry of the location of the points is interesting, which shows the degree of imbalance in the processes occurring in the heart. The paper considers asymmetry in each of the four quadrants of this graphical representation as a possible mechanism for detecting various arrhythmias.