Accurate and Model-Free QT Correction Method

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In the electrocardiogram (ECG), the QT interval is one of the most important signals. The challenge in the interpretation of the QT measurement is its dependence on the heart rate (RR intervals). To normalize out this dependency, several approximative correction methods have been developed, e.g., the power-law formulas of Bazett and Fridericia that are still in clinical use. We have developed a new QT correction method, *AccuQT*, which is superior to all the existing QT correction tools in the market.

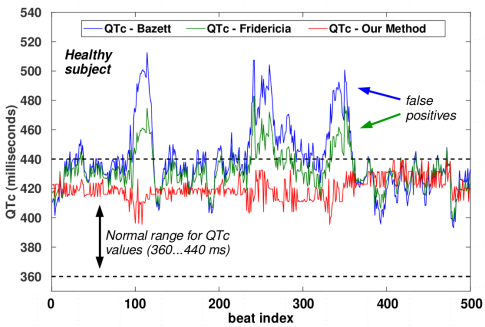

Figure: *Corrected QT intervals for a healthy subject. Our method shows no false positives in contrast with the conventional QT correction tools.*

AccuQT originates from transfer entropy (TE) in information theory. Previously, we have applied TE to solve the probabilistic dependence of the QT intervals on the RR intervals. Based on this dependence, we have developed a numerical software that takes the set of RR and QT intervals as the input, and computes the exact QT correction as an output without any approximations or external models.

The difference between AccuQT and the conventional QT correction methods is drastic: AccuQT dynamically adapts to a multitude of previous RR intervals and gives the true QT correction as an output. In our test set for healthy subjects, the Bazett and Fridericia formulas lead to up to 30% probability for false positives, whereas in AccuQT the result is 0%. On the other hand, the detection rate for abnormal QT times is very high.

We have developed a QT correction method, AccuQT, which is based on the exactly computed dynamical RR-QT dependence. The results are superior compared to the conventional methods. AccuQT is readily applicable to ECG monitoring devices for clinical use, as well as to all the phases of drug development including QT measurements.