

## **Analysis of P-wave morphology in the ECG CHRIS study database to predict complex arrhythmias.**

MSc Thesis

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The electrocardiogram (ECG) is a recording of the electrical activity of the heart measured from electrodes placed on the surface of the chest. The ECG is composed of different waves, which arise from the electrical activation of different part of the heart. The correct temporal sequence and the regular shape of these waves is indicative of a healthy cardiac state. On the other hand, the analysis of the electrocardiographic waves in the ECG signal can give information on the presence of cardiac diseases. In particular, the characterization of the P-wave (the smallest ECG wave, which is representative of the activation of the atrial chambers) is gaining increasing attention, as a non-invasive marker of atrial chamber functionality and disease state.

Our research interest is to find novel markers of cardiac diseases and to predict complex arrhythmias, such as atrial fibrillation,<sup>1-3</sup> by characterizing the morphology of the P-wave in a large database of ECG signals, obtained from the Cooperative Health Research in South Tyrol (CHRIS) study, a population-based resource established by the Eurac Research Institute for Biomedicine.

We are looking for an enthusiastic student with experience in Matlab coding, to develop/optimize algorithms of signal analysis for the quantification of P-wave morphology in ECG signals from the CHRIS study dataset. The research is carried out in collaboration with the Eurac Research Institute for Biomedicine in Bolzano.

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3. Marsili et al. 2020, *Computers in Biology and Medicine* 116:103540.  
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