

## **Public Service of Electrocardiogram Interpretation for Research and Education**

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### **INTRODUCTION**

The paper is devoted to a project of public service of electrocardiogram interpretation based on the Internet. The service is targeted to medical researchers that require specialized processing, very close to the clinically used procedures. Another important area of application is the education about electrophysiology and biosignal interpretation. The main task of the server is to perform the requested computation on the user data and return the result. The server contains also the set of downloadable reference ECG data, and the collection of relevant publications.

### **METHODS**

The server software contains three main procedures for input data validation, signal processing and output formatting. The service does not publish the source code in any form, and therefore closes the gap between high quality copyrighted software and the open source code modified by anyone. The software is ready to use in multiple asynchronous threads remotely launched and controlled by the users via limited set of options. Any modern graphic-based web browser may be applied as user interface. Its role is limited to the transfer of user file, the selection of methods and options and the presentation of results. The user manual and the knowledge guide are provided in HTML format and contain links to the original papers.

### **RESULTS**

Currently, the service finalized the validation of basic processing tasks: heart beats detection, clustering of shapes, detection of arrhythmia events and computation of heart rate variability. In the near future we plan to add further subroutines for ST segment analysis, QT dispersion and the T wave alternans. The supported formats of user data include most popular 12-lead devices, Holter recorders and the binary file of user defined sampling rate (125...500 Hz).

### **DISCUSSION**

The service is believed to integrate the efforts of software engineers usually developing such procedures on demand. Our approach limits the repeated work and the time and expenses for evaluation. The service is supposed to get recognition in centers of medical research confirmed by its impact in the development and standardizing of electrocardiology. Thanks to the independent validation, the contribution to the service may be considered as corresponding to a scientific publication. The commercial ECG equipment manufacturers are also welcome and may manifest their authorship by the company logo or name.

### **CONCLUSION**

The set of methods in the form of remotely executable subroutines is expected to provide a high quality service for wide range of medical researchers over the Internet.