

Remote web-based ECG interpretation services using human experts and computer aided procedures

The ECG interpretation is currently a fully automated process [1] and consists of various signal processing, pattern recognition and decisive procedures. The representative patterns and their physiological meaning are defined by the standards established world wide, but the mathematical methods differ from one software manufacturer to the other. Unfortunately for the manufacturers, the most sophisticated algorithms are rarely demanded, since the corresponding medical cases are relatively infrequent [2]. The approach proposed and prototyped in our laboratory bases on designing all the advanced ECG interpretation routines as distributed web services. The key idea is to extend the today's connectivity by co-operating of multiple method-specialized complementary interpretation services [3]. The service could be organized and managed by the inventor of a particular diagnostic method preserving his intellectual property rights.

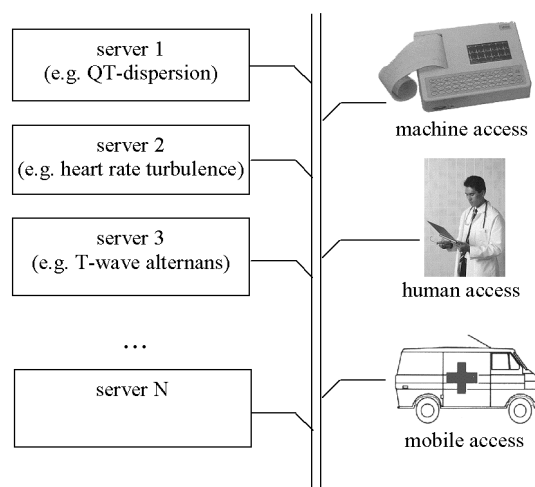


Fig. 1 The example of distributed diagnostic network including multiple clients and multiple specialized interpretation nodes.

Except for the signal processing algorithm, all the issues as client authorization, signal verification and others are common for any ECG interpretation routine designed as a web service. The prototype of the service was build on a Linux-based web server and supports human and machine access modes. The example service are designed and developed for QT-dispersion interpretation, and the principle of this implementation was facing and solving all the range of technical issues. The experimental part confirmed the hope for the practical usefulness of the service. The diagnosis split to multiple different interpretation tasks ordered from remote specialized services in parallel, is usually completed faster than a sequential local analysis performed by an interpretive electrocardiograph due to the computation power limits.

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- [3] Tadeusiewicz R. Automatic Understanding of Signals. In: Kłopotek MA., Wierchoń ST., Trojanowski K. (eds) Intelligent Information Processing and Web Mining. Springer 2004, pp. 577-590