DECISION SUPPORT MODULE FOR HEMOSTASIS FUNCTIONAL STATE ESTIMATION

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Hemostasis is the physiological process in a human body that stops bleeding and maintains normal blood flow in the circulation. Disorders of hemostasis can be dangerous for patient life. Therefore, It's important to diagnose them fast and precisely.

Low-frequency piezoelectric thromboelastography is a test that provides information about all components of hemostasis. Thromboelastograph is a medical device that can execute this test.

Thromboelastograph presents the blood test result as graphic information with a set of additional numeric parameters which can be hard to interpret in detail by.

The existing decision support solution for thromboelastograph uses empirical methods to estimate the general state of hemostasis. This may not be enough for high-quality diagnosis. This paper describes the development of the decision support module that uses machine learning methods to distinguish eleven functional states of hemostasis.

A cascade classification algorithm based on the diagnose method expert uses to estimate the functional state of hemostasis was developed (Figure 1). Testing on real blood tests dataset showed high metrics values. The cross-validation accuracy of the cascade classification algorithm is 92.66 %. The classification algorithm was implemented in the decision support module that became a part of thromboelastograph software and is used to help doctors.

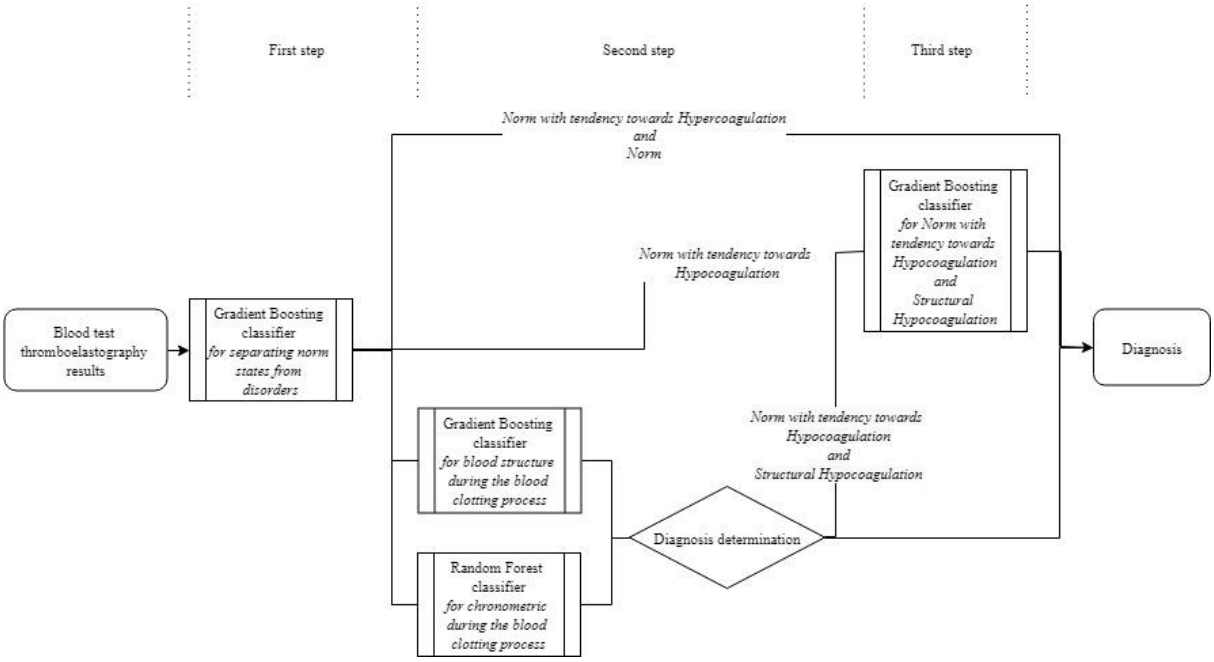

Fig. 1. The scheme of the cascade classifier developed for the decision support module

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