

# ABSTRACT

## **Actuality of theme:**

For a while it seemed: why all these Bayesian methods are needed, we have neural networks and they work so well. But as often happens, at some point it became clear that the benefits of neural network and Bayesolinguistic approaches can be combined. First of all - due to the fact that the techniques of variant Bayesian inference appeared, and these models do not contradict each other, but on the contrary, complement each other perfectly, mutually reinforcing each other.

The Bayesolinguistic approach is perfectly combined, and more work is being done in our eyes. For example, at a major NIPS machine learning conference, there were four workshops on Bayesian methods, and some of the workshops were just about crossing them with neural networks.

Thus, Bayesolinguistic Networks and their use for data analysis can increase productivity and efficiency and automatically become highly demanded in development, and their implementation is becoming an urgent task everyday.

## **The aim of the study:**

The main purpose of this work is to research and develop mathematical and software tools for the Bayesolinguistic Network and to use them for data analysis.

To achieve this goal, the **following tasks** were formulated:

- Explore existing implementations of the Bayesolinguistic Network;
- Investigate existing algorithms for delineation of the ECG signal;
- Investigate existing main component methods;
- Develop mathematical support;
- Develop software;
- Perform an experimental study of the proposed solutions.

## **Object of study:**

The process of developing Bayesolinguistic Networks and using them to analyze data.

## **Subject of study:**

Methods and algorithms used for Bayesolinguistic Networks and their use for data analysis.

**Research methods:**

During the research and development in the dissertation, the method of principal components and the algorithm of delineation of the ECG signal were used.

**Scientific novelty:**

The most significant scientific results of the master's thesis are:

- Implementation of latent variable methods and principal component methods;
- Creation of the Bayesolinguistic Classifier of the ECG cardiocycle.

**The practical value of the obtained results is** determined by the fact that the proposed algorithm with very low error determines the disease based on the loaded cardiogram.

**Relationship with working with scientific programs, plans, topics:**

**Testing:** The main points of the work were reported and discussed at All-Ukrainian scientific-practical conference of young students and students “Information systems and technology management” (ICTY-2019)

**Publications:** Theses of the thesis are published in All-Ukrainian scientific-practical conference of young students and students “Information systems and technology management” (ICTY-2019).

**Keywords:** Bayesian-Linguistic Networks, Principal Components Method, ECG Signal Delineation Algorithm.