поверхні тіла людини з метою визначення розташування патологічного вогнища називається термографією. Прилад для термографії називається тепловізором.

Метод термографії немає протипоказань. Він є об'єктивним, простим і абсолютно нешкідливим, дає досить точну топічну діагностику вогнищ запалення, новоутворень, некрозів та інших локальних прояві різних захворювань; мінімальний реєстрований градієнт температури між двома точками на відстані 1 мм становить 0.1с. Розроблено методи термографії в інфрачервоному (ІЧ), міліметровому (мм) і дециметровому (дм) діапазонах довжин хвиль.

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NEW METHOD OF SOLVING THE CLASSIFICATION PROBLEM

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In machine learning and statistics, classification - is a problem of identification. New observations' set values for identification are divided into classes in terms of the information about the training sample, class of the members of which is known.

In machine learning and statistics, classification is the problem of identification to which of a set of categories (sub-populations) a new observation belongs, on the basis of a training set of data containing observations (or instances) whose category membership is known. In the terminology of machine learning, classification is considered an instance of supervised learning, i.e. learning where a training set of correctly identified observations is available. The corresponding procedure of uncontrolled allocation is known as clustering and consists in grouping data into categories on the basis of its extent of similarity.

We suggest a new approach for solving the classification problem, which is based on the using ε-nets theory. In it is showed that for ε-separating of two sets one can use their ε-nets in the range space w.r.t. halfspaces, which considerably reduce the complexity of the separating algorithm for large sets' sizes. The necessary and sufficient conditions of ε-separability of two sets are proved in.

Consider the separation space which contains the possible values of ε for ε-nets of both sets. The separation space is quasi-convex in general case.

Lemma 1. Let two random variables ξ, η exponentially distributed with parameters μ_ξ, μ_η then function $y(x)$, which separates separation space and its complement is convex.

Lemma 2. Let two random variables ξ, η uniformly distributed with parameters a_ξ, b_ξ and a_η, b_η, then function $y(x)$, which separates separation space and its complement is linear decreasing function.

To check the necessary and sufficient conditions of ε-separability of two sets one can solve the optimisation problem, using the separation space as constraints. If the solution of the optimisation problem does not satisfy the condition

$$\varepsilon_A n_A + \varepsilon_A n_A < \varepsilon(n_A + n_B),$$

then the sets A and B are not ε-separable. The lower bound of the separation space is convex for the exponential distribution and linear for the uniform distribution. So, we have convex and linear optimisation problems in these cases.

According to the theorem 2, one can use the theoretical separation space as constraints for the optimisation problem in particular case.

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THE RESONANT FREQUENCY OF BIOLOGICAL OBJECTS

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The aim of the thesis is the study of organism vibration frequencies depending on human condition, and frequency range of the cardiovascular system of the human body, on detection the vibration frequency data connection with normal and pathological conditions of the system.

Research objectives: to establish the diagnostic values of the cardiovascular system frequency in Hz, using general resonant frequency.

We know that the main form of movement is oscillatory process that is periodic movement in time. Tiny particles and galaxies are in motion, they are all fluctuating. Analysis of the processes occurring in interplanetary space, seismic phenomena in the earth's crust, magnetic phenomena in the atmosphere, and changes in the functional state of living organisms led to the conclusion that all natural objects form a single interacting system of oscillations. Cyclical motion of harmonic oscillations generates rhythm.

In biological objects there are physiological and ecological (adaptive) rhythms. The physiological rhythm is one of the main forms of life observed in all living organisms and at all levels of organization of living matter – from subcellular structures to the whole organism. Biological rhythms that match on the multiplicity with geophysical rhythms are called adaptive or ecological rhythms. Adaptive and physiological rhythms elaborated in the evolution as