MUHAMMAD AL-XORAZMIY
NOMIDAGI TATU FARG'ONA FILIALI

FERGANA BRANCH OF TUIT
NAMED AFTER MUHAMMAD AL-KHORAZMI

"AL-FARG'ONIY AVLODLARI"

ELEKTRON ILMIY JURNALI | ELECTRONIC SCIENTIFIC JOURNAL

TA'LIMDAGI ILMIY, OMMABOP VA ILMIY TADQIQOT ISHLARI

4-SON 1(8)
2024-YIL

TATU, FARG'ONA
O'ZBEKISTON

ISSN 2181-4252

O‘ZBEKISTON RESPUBLIKASI RAQAMLI TEXNOLOGIYALAR VAZIRLIGI

MUHAMMAD AL-XORAZMIY NOMIDAGI TOSHKENT AXBOROT TEXNOLOGIYALARI UNIVERSITETI FARG‘ONA FILIALI

Muassis: Muhammad al-Xorazmiy nomidagi Toshkent axborot texnologiyalari universiteti Farg‘ona filiali.
Chop etish tili: O‘zbek, ingliz, rus.
Jurnal texnika fanlariga ixtisoslashgan bo‘lib, barcha shu sohadagi matematika, fizika, axborot texnologiyalari yo‘nalishida maqolalar chop etib boradi.

Учредитель: Ферганский филиал Ташкентского университета информационных технологий имени Мухаммада ал-Хоразми.
Язык издания: узбекский, английский, русский.
Журнал специализируется на технических науках и публикует статьи в области математики, физики и информационных технологий.

Founder: Fergana branch of the Tashkent University of Information Technologies named after Muhammad al-Khorazmi.
Language of publication: Uzbek, English, Russian.
The magazine specializes in technical sciences and publishes articles in the field of mathematics, physics, and information technology.

2024 yil, Tom 1, №4
Vol.1, Iss.4, 2024 y

ELEKTRON ILMIY JURNALI **ELECTRONIC SCIENTIFIC JOURNAL**

«Al-Farg‘oniy avlodlari» («The descendants of al-Fargani», «Potomki al-Fergani») O‘zbekiston Respublikasi Prezidenti administratsiyasi huzuridagi Axborot va ommaviy kommunikatsiyalar agentligida 2022-yil 21 dekabrda 054493-son bilan ro‘yxatdan o‘tgan.

Jurnal OAK Rayosatining 2023-yil 30 sentabrdagi 343-sonli qarori bilan Texnika fanlari yo‘nalishida milliy nashrlar ro‘yxatiga kiritilgan.

Tahririyat manzili:
151100, Farg‘ona sh.,
Aeroport ko‘chasi 17-uy,
202A-xona
Tel: (+99899) 998-01-42
e-mail: info@al-fargoniy.uz

Qo‘lyozmalar taqrizlanmaydi va qaytarilmaydi.

FARG’ONA - 2024 YIL

Jurnal quyidagi bazalarda indekslanadi:

Google Scholar | zenodo | ORCID | CYBERLENINKA | WORLD of JOURNALS | DRJI Directory of Research Journals Indexing

Eslatma! Jurnal materiallari to'plamiga kiritilgan ilmiy maqolalardagi raqamlar, ma'lumotlar haqqoniyligiga va keltirilgan iqtiboslar to'g'riligiga mualliflar shaxsan javobgardirlar.

MUNDARIJA | ОГЛАВЛЕНИЕ | TABLE OF CONTENTS

MUNDARIJA | ОГЛАВЛЕНИЕ | TABLE OF CONTENTS

MUNDARIJA | ОГЛАВЛЕНИЕ | TABLE OF CONTENTS

REGIONS APPLICATIONS SYSTEMS RECOGNITION

Asrayev Muhammadmullo Abdullajon og‘li,
Associate Professor at TATU, Fergana Branch, named after Muhammad al-Khwarizmi
asrayevmuhammaddullo@gmail.com

Muxtoriddinov Muhammadyusuf Temirxon o‘g‘li,
assistant at TATU, Fergana Branch, named after Muhammad al-Khwarizmi
mMuxtoriddinov@gmail.com

Abstract. Robots' sense of touch . Many robotics tasks, in particular automatic assembly of products, require direct physical contact between the object and the robot's gripping unit. Since the presence of such contact is a necessary condition for the successful solution of the problem, the problem arises the desire to use it simultaneously for recognizing the object with which the robot interacts, to evaluate its parameters: geometric dimensions, orientation in space, degree of surface roughness .

Key words: Robots', General, Remote sensing in geophysics, Seismology, Electrocardiography

Introduction. To date, significantly fewer devices and methods have been developed for artificial touch than for artificial vision. However, the speed of information processing in tactile sensors can be even higher than in optical ones. This is due to the fact that in the first case, a significantly smaller number of signal samples are processed than when processing video signals. Tactile sensors can solve various problems: determining the state of a surface, recognizing the shape of contours and studying other characteristics of an object by “feeling” it with a sensitive element. The advantages of tactile sensors are their mechanical flexibility, low cost, ease of use, as well as the linear dependence of electrical resistance from deformation, and therefore, from local load. Areas of application of tactile sensors include industrial robotics, remote control, including on devices designed to operate in adverse environments.

Research methods. *Remote sensing in geophysics.* This refers to observations of the Earth's surface and other planets - these are various satellites, reusable ships, orbital stations and and much more. Each of these systems produces huge flows of information. Since the number of consumers of this information is rapidly increasing, it seems necessary to perform automatic classification of observations in a minimum time consistent with the urgency of the requests. The ideal solution is considered to be real-time image processing and delivery of results to users.

Seismology. Seismic waves can be observed and recorded at any point on the earth's surface. Seismographs are used for this purpose - devices that have an extremely high sensitivity to mechanical vibrations of the earth. Automatic decoding of these records is of great interest for understanding the phenomena occurring in the thickness of the earth's crust. To describe seismic waves, a grammar was developed, implemented on a deterministic finite automaton. Given that the signal segments have the same duration, among the possible interferences, one should take into account only mistakes substitutions. Each of these additional rules can be taken with a certain weight, depending on the error.

The solution is to weight permutations between two words according to the distance separating these classes in the chosen feature space. In this case, the recognition operation turns out to be identical to the operation of finding an optimal path in a tree graph, since such a representation can be associated with any finite-state grammar. states. The experiments were carried out on an array that included 321 implementation. From them 50 were used V quality educational samples And as a basis for developing the grammar. Depending on the number of classes, the overall results showed two values: the percentage of correct recognition and the time it takes to complete it. With the number of classes around 10 the execution time increases sharply. If we take into account the resulting at the same time, the percentage of correct recognition is quite high, then it turns out that the intuitive choice of precisely this number of classes is quite justified. The results can be improved somewhat by using the length of the segment as an additional feature. In addition, it is of interest to consider the combination of this procedure with a system of expert assessments.

Electrocardiography is one of the methods for studying the work of the heart, based on recording the difference in electrical potentials that arise during cardiac activity. Schematically, the heart can be represented as an electrical dipole of variable length, depending on the heart rhythm. The shape of the electrical signal, changing over time, and its amplitude depend on the point of removal. A typical oscillogram of an ECG signal is shown in Fig. 1.1.

The letters PQRST, proposed by V. Einthoven, allow for a convenient description of individual features of this continuous curve. The periodic ECG signal has a relatively simple structure, so a procedure based on a grammatical description was proposed for its automatic recognition.

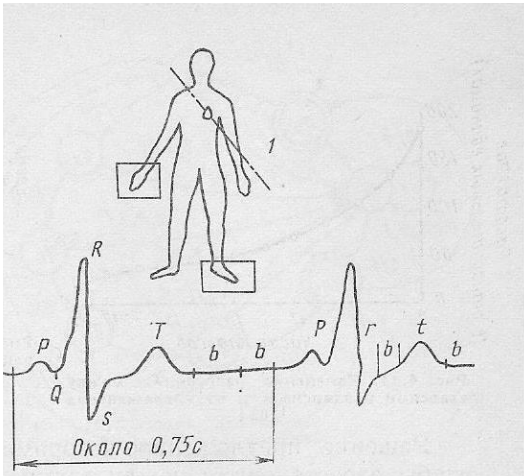

Fig. 1.1. Typical electrocardiogram, where 1 is the electrical axis of the heart.

This description ECG is being compiled from four symbols - *p, r, b, t,*

each of which corresponds to a specific section of the curve in Fig. 1.6. Symbol *p corresponds to the P* wave ; *r* – *RS* transition; *b* – relative to the flat part separating the extremes *of S* and *T* (about 0.1 s); *t* – wave *T. If we take the wave P* as the starting point , then in such notations a normal ECG can be described by sequences of symbols: *prbtb* , *prbtbb* , *prbtbbb* , etc.

Syntactic descriptions of this kind can be obtained using the grammar *G* :

$G = \{ V_t , V_n , P, S \}$, $V_t = \{ p, r, t, b \}$, $V_n = \{ S, A, B, C, D, E, H \}$,

$P = \{ S \to pA, A \to rB, B \to bc, C \to tD, D \to b, D \to bE, E \to b, E \to bH, E \to pA, H \to b, H \to bS, H \to pA \}$.

Results.The language generated by this grammar can be mapped to a finite state machine, the diagram of which is shown in Fig. 1.7. In order to detect an abnormal ECG and distinguish it from a normal one, the output “0” is used if the ECG under study corresponds to the “normal” standard, and the output “1” is used if the ECG under study corresponds to the “normal” standard. otherwise. This output in Fig. 1.2 is connected to the transition lines. This type of recognition machine is very primitive: it is capable of detecting only gross deviations from the norm. In reality, the analysis of an abnormal ECG is a serious task that is performed by qualified specialists.

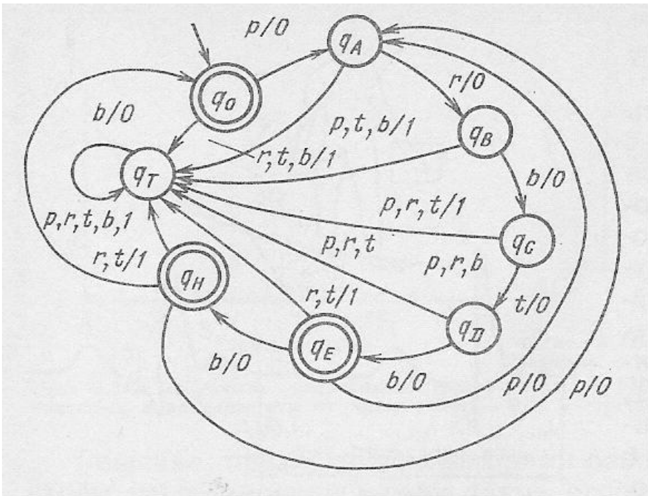

Fig. 1.2. Scheme machine gun For recognition electrocardiograms

Industrial application. Automatic control of parts during their manufacturing process is a task for which various information processing tools are used and developed. However, the introduction of devices that automatically measure the dimensions, surface condition, and other characteristics of objects during the manufacturing process is often associated with considerable difficulties. One of the main tasks that arise during automatic control is the task of training the recognition device.

Conclusion. In the process of manufacturing parts or units, the variety of possible defects can be so great that compiling a training set for the machine that includes all variants of situations subject to control is often an impossible task. Therefore, it is necessary either to create a training set based on a limited set of typical defects that require identification, or to introduce an automatic learning procedure, which seems a priori incompatible with many industrial applications. However, the need for such systems is becoming increasingly more acute in those areas where one has to deal with repeatedly repeated operations or where high speed of execution is required.

The tasks of assembling units and mechanisms are also gradually being transferred to robots. In most cases, the elements to be assembled must be fed and oriented in a strictly defined manner. The correctness of this is checked automatically using various sensors, most often optical ones.

References

1. Л. В. Серебряная, Ф. И. Третьяков. МЕТОДЫ И АЛГОРИТМЫ ПРИНЯТИЯ РЕШЕНИЙ// Минск БГУИР 2016
2. Asrayev M. HANDWRITING RECOGNITION USING NEURAL NETWORKS //Engineering problems and innovations. – 2024. – T. 2. – №. Spes. 2 DI.
3. Asrayev M. RESEARCH ON HANDWRITING INPUT OF TWO-DIMENSIONAL TEXT //Engineering problems and innovations. – 2024. – T. 2. – №. Spes. 2 DI.
4. Вл. Д. Мазуров. МАТЕМАТИЧЕСКИЕ МЕТОДЫ РАСПОЗНАВАНИЯ ОБРАЗОВ. Учебное пособие // Екатеринбург 2010.
5. Л.Н. Чабан. Методы и алгоритмы распознавания образов в автоматизированном дешифрировании данных дистанционного зондирования // Москва 2017.
6. Asrayev M. RESEARCH IN NATURAL LANGUAGE PROCESSING //Engineering problems and innovations. – 2024. – T. 2. – №. Spes. 2 DI.
7. Asrayev M. MYSCRIPT-DA SUN'IY INTELLEKT //Engineering problems and innovations. – 2024. – T. 2. – №. Spes. 2 DI.