Министерство образования
Республики Беларусь

БЕЛОРУССКИЙ НАЦИОНАЛЬНЫЙ
ТЕХНИЧЕСКИЙ УНИВЕРСИТЕТ

Кафедра английского языка № 1

Л.А. Иванович
Т.Н. Ланицкая
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ИНФОРМАЦИОННЫЕ ТЕХНОЛОГИИ И РОБОТОТЕХНИКА

Методическое пособие

Минск 2006

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Методическое пособие
по практическому курсу научно-технического перевода
для студентов II курса факультета
«Информационные технологии и робототехника»

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Основная цель пособия – обучение и дальнейшее совершенствование навыков перевода научно-технической литературы по специальности.

Пособие состоит из 10 блоков (Units) и включает в себя систему лексико-грамматических упражнения, направленных на формирование навыков перевода, аутентичные научные и технические тексты, тексты для самостоятельного чтения, активный словарь и список наиболее употребительных сокращений в английском языке по данной специальности.

Дополнительные тексты предназначены для проверки усвоения и систематизации учебного материала.

Данное пособие предполагает комплексное использование изученных приемов и способов перевода в практической работе.

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Unit 1

1. Переведите следующие интернациональные слова на русский язык.

а) без словаря

agency	personnel	structure	infrastructure
architecture	management	program	system
business	peripherals	bioinformatics	aspect
algorithm	technology	video	theory
audio			

б) со словарем

data	engineering	digital	licence
actual	integral	support	accurate
file	advanced	service	magazine
formal	focus		

2. По словообразовательным элементам определить, к каким частям речи относятся следующие слова и перевести на русский язык.

to control	control	controller	controllable
to develop	development	developer	developed
to process	process	processing	processor
to provide	provision	provider	provided
to perform	performance	performer	performing
to store	store	storage	stored

3. Переведите следующие словосочетания на русский язык, обращая внимание на то, что перевод таких сочетаний обычно начинается с последнего слова цепочки, а остальные слова цепочки переводятся:

1) существительным в родительном падеже

database application — *приложение системы управления баз данными (приложение СУБД)*

2) прилагательным

computer software — *компьютерное программное обеспечение (ПО)*

3) существительным с предлогом

(anti-) virus protection — *защита от вирусов*

Computer application, storage systems, office automation system, work station, data entry personnel, information technology, network services, data storage, computer data, voice recognition, voice recognition software, computer software, system administration, voice response software, data entry operator, fire alarm system.

4. Переведите на русский язык предложения со словом rather, имеющим следующие значения:

rather: *1. скорее; 2. довольно*
rather than: *а не; вместо того, чтобы*

1. Another form of memory is an optical disc which operates in optical rather than electrical mode to read and write data.
2. In a DRAM unit, each memory cell comprises a capacitor (rather than a flip flop), and a single transistor.
3. This theory is rather controversial.
4. Informatics tackles the problem first rather than the technologies, as it is often seen in many areas, such as business and scientific research.
5. The trouble was rather worse than I expected.

5. Переведите предложения, содержащие глагол-сказуемое в страдательном залоге.

1. Data entry personnel may be included (in the IT budget) if they are considered a part of the technology staff.
2. Audio-visual equipment can be operated stand-alone.

3. Information science is often studied as a branch of computer science and information technology and is related to database, ontology, and software engineering.
4. All the other devices which can be connected to the CPU unit are commonly called peripherals.
5. This data encryption standard, a code that was considered unbreakable a dozen years ago, has been broken.
6. CDs, DVDs, and other optical discs are widely used storage units, when large storage capacities are required.
7. RAM is a type of memory in which specific content can be very fast accessed directly (read or written), regardless of the sequence in which it was retrieved.
8. Electric current flow through transistors in memory units is controlled by semiconductors.
9. In multi-user environments, an operating system is required to control terminal operations on shared access basis, as only one user can enter the system at the same time.
10. A mobile network is being built in this region.
11. The system stability has greatly improved thanks to new high-performance components.

6. Выполните полный письменный перевод следующего текста.

Текст

IT and computer science

Information Technology means the use of hardware, software, services, and supporting infrastructure to manage and deliver information using voice, data, and video.

To further define information technology and what should be included as far as the IT budget, the following information is provided: Information Technology includes:

- all computers with a human interface
- all computer peripherals which will not operate unless connected to a computer or network all voice, video and data networks and the equipment, staff and purchased services necessary to operate

them, all salary and benefits for staff whose job descriptions specifically includes technology functions, i.e. network services, applications development, systems administration all technology services provided by vendors or contractors operating costs associated with providing information technology

Examples of Information Technology:

- Telephone and radio equipment and switches used for voice communications.
- Traditional computer applications that include data storage and programs to input, process, and output the data.
- Software and support for office automation systems such as word processing and spreadsheets, as well as the computer to run them.
- Users' PCs and software.
- Server hardware and software used to support applications such as electronic mail/groupware, file and print services, database, application/ web servers, storage systems, and other hosting services.
- Data, voice, and video networks and all associated communications equipment and software.

Computer science is the study of computers – namely, their design (architecture) and their uses for computations, data processing, and systems control. Computer science includes engineering activities such as the design of computers and of the hardware and software that make up computer systems. The field also encompasses theoretical, mathematical activities, such as the design and analysis of algorithms, performance studies of systems and their components by means of techniques like queuing theory, and the estimation of the reliability and availability of systems by probabilistic techniques. Since computer systems are often too large and complicated to allow one to predict the failure or success of a design without testing it, experimentation is incorporated into their development cycle. Computer science is generally considered a discipline separate from computer engineering, although the two disciplines overlap extensively in the area of computer architecture, which is the design (and study) of computer systems.

The major subdisciplines of computer science have traditionally been *architecture* (including all levels of hardware design, as well as the

integration of hardware and software components to form computer systems), *software* (the programs, or sets of instructions, that tell a computer how to carry out tasks), here subdivided into software engineering, programming languages, operating systems, information systems and databases, artificial intelligence, and computer graphics, and *theory*, which includes computational methods and numerical analysis on the one hand and data structures and algorithms on the other.

Unit 2

1. Переведите следующие интернациональные слова на русский язык.

Information security	infect	financial
aspect	service	term
communication technologies	form	infrastructure
modification	risk	authorization

2. Переведите следующие слова на русский язык, учитывая, что префикс *inter-* соответствует значениям приставок между-, взаимо-, внутри-, а префикс *mis-* имеет отрицательное значение.

Interact, interaction, interatomic, interchange, interconnect, interlock, international, interoperability, misbehavior, miscalculate, misconception, misinform, misunderstanding, misuse.

3. По словообразовательным элементам определить, к каким частям речи относятся следующие слова и перевести на русский язык.

to facilitate	facilitation	facility	
to secure	secure	security	
to protect	protection	protective	
to serve	service	serviceable	
to transmit	transmission	transmitter	transmissible
to identify	identification	identifier	identical

to compute computation computer computable

4. Переведите следующие предложения на русский язык, обращая внимание на перевод союза: *neither... nor - ни... ни*

1. It is an important point that information security is neither hermetic nor watertight nor perfectible.
2. The scientist neither wrote nor phoned him.
3. Neither the photon nor the neutron nor electrons involved in fission disappear.
4. He will neither understand nor help you.
5. This student neither understands nor cares what happened.
6. Neither misunderstanding nor arguments had any effect on him.
7. They said the program was easy and new, but in fact it was neither easy nor new.

5. Переведите следующие предложения на русский язык. Обратите внимание на перевод сказуемого.

1. Information security is not confined to computer systems, nor to information in an electronic or machine-readable form.
2. Information Science or Informatics is often, though not exclusively, studied as a branch of Computer Science and Information Technology and is related to database, ontology and software engineering.
3. Within Information Science attention has been given in recent years to human computer interaction (HCI).
4. Computers that are being developed demand long-term memory units with large capacity.
5. A single memory chip is made of several million memory cells.
6. Numerous triggers and registers are not only used in the memory chips, but also in ALU and control units.
7. The flow of electric current through the transistors in memory chips is controlled by semiconductor material.

8. Computer memory is a physical device storing such information as data or programs on a temporary or permanent basis for a further processing by the computer.
9. The data encryption standard which has been considered unbreakable for twelve years, has been cracked.

6. Выполните полный письменный перевод текста. Обратите внимание на перевод конструкции *neither... nor*

Текст

Information security

Information security deals with several different aspects of information. Another common term is information assurance. Information security is not confined to computer systems, nor to information in an electronic or machine-readable form. It applies to all aspects of safeguarding or protecting information or data, in whatever form.

U.S. National Systems Security Glossary defines Information systems security (INFOSEC) as: - the protection of information systems against unauthorized access to or modification of information, whether in storage, processing or transit, and against the denial of service to authorized users or the provision of service to unauthorized users, including those measures necessary to detect, document, and counter such threats.

Most definitions of information security tend to focus, sometimes exclusively, on specific usages and/or, particular media, e.g., "protect electronic data from unauthorized use". In fact, it is a common misconception, or misunderstanding, that information security is synonymous with computer security - in any of its guises: computer and network security, information technology (IT) security, information systems security, information and communications technology (ICT) security. Each of these has a different emphasis, but the common concern is the security of information in some form (electronic in these cases): hence, all are subsets of information security. Conversely, information security covers not just information but all infrastructures that facilitate its use - processes, systems, services, technology, etc., including computers, voice and data networks, etc.

It is an important point that information security is neither hermetic nor watertight nor perfectible. No one can ever eradicate all risk of a proper or capricious use of any information. The level of information security sought in any particular situation should be commensurate with the value of the information and the loss, financial or otherwise, that might accrue from improper use - disclosure, degradation, denial or whatever.

Unit 3

1. Переведите следующие словосочетания слов, обращая внимание на значение суффикса –able.

common reusable information, movable installation, explainable mistakes, programmable calculator, unbelievable success, readable instruction, separable characters, portable drive, PC compatible device, portable device.

2. Переведите следующие слова на русский язык, обращая внимание на отрицательное значение префиксов *dis-*, *un-*, *in-* (*im-*, *ir-*, *il-*).

logical – illogical
authorized – unauthorized
charge – discharge
advantage – disadvantage
complete – incomplete
accurate – inaccurate
appropriate – inappropriate
proper – improper
correct – incorrect
connect – disconnect
regular – irregular
divisible – indivisible
important – unimportant
ability - inability

3. Переведите на русский язык следующие словосочетания, пользуясь «правилом ряда».

ERP (enterprise resource planning) software, human resources manager, transport costs, government department, supply chain management, customer satisfaction, current business process, software development,

information solution, customer – client information system, production aspects, distributed client –server application.

4. Переведите следующие предложения на русский язык, обращая внимание на перевод since

since (cj) – так как; с тех пор как

since (prp) – с (с момента времени)

1. Since many of the processes occur in common across various types of business, common reusable software may provide cost-effective alternative to customized software.
2. Since computer system is often too large and complicated to allow you to predict failure or success of a design without testing it, experimentation is incorporated into their development cycle.
3. A few elementary substances such as gold, silver, copper have been known since old times.
4. 100 years has passed since the day the radio was invented.
5. Jet engines have rapidly progressed since the end of World War II.
6. Since the first computer appeared, many changes have happened in the field of science.

5. Переведите следующие предложения, содержащие прилагательные в различных степенях сравнения, на русский язык.

1. The benefice from enterprise resource planning are claimed to include: lower inventory carrying costs, lower ordering costs, lower investments in equipment, plant, land; more flexible production process; more efficient lot sizes and scheduling.
2. Because of their wide scope of application within the company, ERP software systems rely on some of the largest and most complex bodies of software ever written.
3. If the system attempts to implement best practices inappropriate to the organization, the system may suffer from so-called "culture clash" consequences.

4. Historically, up to about 1990, confidentiality remained the most important element of the information security.
5. Flash memory is a type of memory that is rewritable, though rewriting is far more time-consuming than reading.
6. A hybrid computer combines the characteristics and advantages from analog and digital systems; it offers greater precision than the former and more control capability than the latter.
7. The most commonly used output device is a specially adapted unit known as monitor.
8. The most important hardware unit is the processor.
9. Mainframe systems are the biggest and the most expensive computers.
10. The highest honour in computer science is Turing Award.

6. Выполните полный письменный перевод следующего текста. Обратите внимание на перевод страдательного залога.

Текст

Enterprise resource planning

Enterprise resource planning as a term, derived from material resource planning. ERP systems typically handle the manufacturing, logistics, distribution, inventory, shipping, invoicing, and accounting for a company. Enterprise Resource Planning or ERP software can aid in the control of many business activities, like sales, delivery, billing, production, inventory management, and human resources management.

ERPs are often called back office systems indicating that customers and the general public are not directly involved. This is contrasted with front office systems like customer relationship management systems that deal directly with the customer. ERPs are cross-functional and enterprise wide. All functional departments that are involved in operations or production are integrated in one system. In addition to manufacturing, warehousing, and shipping, this would include accounting, human resources, marketing, and strategic management. In the early days of business computing, companies used to write their own software to control their business processes. This is an expensive approach. Since many of these processes occur in common across various types of

businesses, common reusable software may provide cost-effective alternatives to custom software. Thus some ERP software caters to a wide range of industries from service sectors like software vendors and hospitals to manufacturing industries and even to government departments.

Implementation

Because of their wide scope of application within the firm, ERP software systems rely on some of the largest bodies of software ever written. Implementing such a complex and huge software system in a company usually involves an army of analysts, programmers, and users, and often comprises a multi-million dollar/yen/euro project in itself for bigger companies, especially transnational ones.

Enterprise resource planning systems are often closely tied to supply chain management and logistics automation systems. Supply chain management software can extend the ERP system to include links with suppliers.

To implement ERP systems, companies often seek the help of an ERP vendor or of third-party consulting companies. Consulting in ERP involves two levels, namely business consulting and technical consulting. A business consultant studies an organization's current business processes and matches them to the corresponding processes in the ERP system, thus 'configuring' the ERP system to the organisation's needs. Technical consulting often involves programming. Most ERP vendors allow changing their software to suit the business needs of their customer.

Some risks to watch out for in implementing an ERP system include:

- User Resistance/Revolt - Users who fear being downsized may sabotage the system.
- Mismatch between ERP system and Organizational Culture - If a system attempts to implement best practices inappropriate to the organization, the system may suffer from "culture clash" consequences.
- Inability to control technology
- Illogical processing
- Inability to stop processing quickly
- Cascading errors

- Repetition of Errors
- Concentration of data
- Inability to substantive processing
- Concentration of responsibility

Advantages

The benefits from enterprise resource planning are claimed to include:

lower inventory carrying costs, lower ordering costs, lower production costs, lower accounting and record keeping costs, lower transportation costs, lower investment in equipment, lower investment in plant, lower investment in land, reduced assembly-line down-times, more flexible production processes, more efficient lot sizes and scheduling, reduced errors due to better coordination, the cost and efficiency improvements (mentioned above) could increase profitability or increase market share (at a lower price), reduced number of stock-outs, reduced fulfillment times, increase process transparency for the customer, allow greater product customization, and thereby better match the exact needs of the customer, the customer satisfaction improvements (mentioned above) could increase sales volume, increase sales revenue (due to a higher effective price, i.e. - no discounts), increase market share, and increase profitability.

7. Выполните реферативный перевод следующего текста при соблюдении требований, предъявляемых к этому виду перевода.

Реферативный перевод текста – это сокращённый письменный вариант полного текста (5-10 раз короче оригинального), так как в процессе работы требуется исключение всей избыточной информации

Этапы работы над реферативным переводом:

- *знакомство с текстом, внимательное чтение;*
- *размётка с помощью скобок для исключения второстепенных частей и повторений;*
- *чтение оригинала без исключенных частей;*
- *полный письменный перевод выбранных частей оригинала. который должен представлять связный текст.*

Текст

Encryption

By encryption, we mean a process of converting information to a disguised form in order to send it across a potentially unsafe channel. The reverse process is called decryption. Using strong encryption techniques, sensitive, valuable information can be protected against organized criminals, malicious hackers, or spies from a foreign military power, for example. Indeed, cryptography used to be almost exclusively a tool for the military. However, in moving into an information society, the value of cryptography in everyday life in such areas as privacy, trust, electronic payments, and access control has become evident. In this way, the field of cryptography has broadened from classical encryption techniques into areas such as authentication, data integrity, and non-repudiation of data transfer.

Basic terminology

Suppose that someone wants to send a message to a receiver, and wants to be sure that no-one else can read the message. However, there is the possibility that someone else opens the letter or hears the electronic communication.

In cryptographic terminology, the message is called plaintext or cleartext. Encoding the contents of the message in such a way that hides its contents from outsiders is called encryption. The encrypted message is called ciphertext. The process of retrieving the plaintext from the ciphertext is called decryption. Encryption and decryption usually make use of a key, and the coding method is such that decryption can be performed only by knowing the proper key. Cryptography is the art or science of mathematical techniques related to such aspects of data security as confidentiality, or keeping secret the content of information from unauthorized parties; data integrity, or detecting the unauthorized alteration of data; authentication, or identifying either entities or data origins; non-repudiation, or preventing an entity from denying previous commitments or actions.

Cryptanalysis is the study of mathematical methods which are used in attempting to defeat cryptographic techniques. Cryptology means the study of cryptography and cryptanalysis.

Basic cryptographic algorithms

The method of encryption and decryption is called a cipher. Some cryptographic methods rely on the secrecy of the encryption algorithms; such algorithms are only of historical interest and are not adequate for real-world needs. Instead of the secrecy of the method itself, all modern algorithms base their security on the usage of a key; a message can be decrypted only if the key used for decryption matches the key used for encryption.

There are two classes of key-based encryption algorithms, symmetric (or secret-key) and asymmetric (or public-key) algorithms. The difference is that symmetric algorithms use the same key for encryption and decryption (or the decryption key is easily derived from the encryption key), whereas asymmetric algorithms use a different key for encryption and decryption, and the decryption key cannot be derived from the encryption key. Symmetric algorithms can be divided into stream ciphers and block ciphers. Stream ciphers encrypt a single bit of plaintext at a time, whereas block ciphers take a number of bits (typically 64 bits in modern ciphers), and encrypt them as a single unit. Asymmetric ciphers (also called public-key algorithms) permit the encryption key to be public (it can even be published to a web site), allowing anyone to encrypt with the key, whereas only the proper recipient (who knows the decryption key) can decrypt the message. The encryption key is also called the public key and the decryption key the private key. The security provided by these ciphers is based on keeping the private key secret.

Modern cryptographic algorithms are no longer pencil-and-paper ciphers. Strong cryptographic algorithms are designed to be executed by computers or specialized hardware devices. In most applications, cryptography is done in computer software. Generally, symmetric algorithms are much faster to execute on a computer than asymmetric ones. In practice they are often used together, so that a public-key algorithm is used to encrypt a randomly generated encryption key, and the random key is used to encrypt the actual message using a symmetric algorithm. This is sometimes called hybrid encryption. Descriptions of many good cryptographic algorithms are widely and publicly available from any major bookstore, scientific library, patent office, or on the Internet. The most studied and probably the most widely spread

symmetric cipher is DES (Data Encryption Standard). Because of the increase in the computing power of computers, the basic version of DES cannot be considered sufficiently safe anymore. Therefore a new, more powerful cipher called AES (Advanced Encryption Standard) was standardized in 2000. It will likely replace DES as the most widely used symmetric encryption algorithm. RSA is probably the best known asymmetric encryption algorithm.

Unit 4

I. Переведите следующие интернациональные слова на русский язык

а) без словаря

human	fact	intellectual
process	situation	specific
idea	action	real
progress	experiment	natural
problem		

б) со словарем

absorb	original
intergrate	consensus
control	director
machine	realm

II. На основе словообразовательных элементов определите, к каким частям речи относятся следующие слова и переведите их на русский язык

define – definition, definite, indefinite
robot – roboticist, robotics, robotic
success – successful, unsuccessful
form - formation, inform – information, informative
direct – director, direction, indirect
science – scientist, scientific

comprehense – comprehension, comprehensible, comprehentibility
use – user, useful, useless, usage

III. Переведите следующие атрибутивные словосочетания. Определите способы перевода атрибутивных словосочетаний.

assembly line
limited realms
a handy tool
manual labor
daily life
higher reasoning
problem - solving
an unconventional control structure
physical robotic design
man-made machine
human thought process
health care and comunication

IV. Переведите следующие предложения на русский язык. Обратите внимание на перевод ing форм. Определите функцию слов с окончанием – ing, - ed.

1. Roboticist are nowhere near achieving this level of artificial intelligence, but they have to make a lot of progress with more limited A I.
2. Computers can already solve problems in limited realms.
3. The computer predicts which action will be most successful based on the collected information
4. It doesn't have any generalized analitical ability.
5. Learning robots recognize if a certain action (moving its legs in a certain way, for instance) achieved a desired result.
6. Some robots can learn by mimicking human actions.
7. In Japan, roboticists have taught a robot to dance by demonstrating the moves themselves.
8. They operate using an unconventional control structure.
9. Instead of directing every action using a central computer, the robots control lower-level actions with low-level computers.
10. Phusical robotic design is a handy tool for understanding animal and human anatomy.
11. Developing AI isn't like building an artificial heart.

V. Выполните полный письменный перевод следующего текста. Обратите внимание на перевод инфинитива и инфинитивных оборотов, причастия и причастных оборотов, герундия.

Текст

Artificial Intelligence

Artificial intelligence (AI) is arguably the most exciting field in robotics. It's certainly the most controversial: Everybody agrees that a robot can work in an assembly line, but there's no consensus on whether a robot can ever be intelligent.

Like the term "robot" itself, artificial intelligence is hard to define. Ultimate AI would be a recreation of the human thought process — a man-made machine with our intellectual abilities. This would include the ability to learn just about anything, the ability to reason, the ability to use language and the ability to formulate original ideas. Roboticists are nowhere near achieving this level of artificial intelligence, but they have had made a lot of progress with more limited AI. Today's AI machines can replicate some specific elements of intellectual ability.

Computers can already solve problems in limited realms. The basic idea of AI problem-solving is very simple, though its execution is complicated. First, the AI robot or computer gathers facts about a situation through sensors or human input. The computer compares this information to stored data and decides what the information signifies. The computer runs through various possible actions and predicts which action will be most successful based on the collected information. Of course, the computer can only solve problems it's programmed to solve — it doesn't have any analytical ability. Chess computers are one example of this sort of machine.

Some modern robots also have the ability to learn in a limited capacity. Learning robots recognize if a certain action (moving its legs in certain way, for instance) achieved a desired result (navigating an obstacle). The robot stores this information and attempts the successful action the next time it encounters the same situation. Again, modern computers can only do this in very limited situations. They can't absorb any sort of information like a human can. Some robots can learn by mimicking human actions. In Japan, roboticists have taught a robot to dance by demonstrating the moves themselves.

Some robots can interact socially. Kismet, a robot at MLT's Artificial Lab, recognizes human body language and voice inflection and responds appropriately. Kismet's creators are interested in how humans and babies interact, based of only on tone of speech and visual cue. This low-level interaction could be the foundation of a human-like learning system.

Kismet and other humanoid robots at the MLT AI Lab operate using an unconventional control structure. Instead of directing every action using a central computer, the robots control lower-level actions with lower-level computers. The program's director Rodney Brooks, believes this is a more accurate model of human intelligence. "We do most things automatically, we don't decide to do them at the highest level of consciousness."

The real challenge of AI is to understand how natural intelligence works. Developing AI isn't like building an artificial heart — scientists don't have a simple, concrete model to work from. We do know that the brain contains billions and billions of neurons, and that we think and learn by establishing electrical connections between different neurons. But we don't know exactly how all of these connections add up to higher reasoning, or even low-level operations. The complex circuitry seems incomprehensible.

Scientists hypothesize on how and why we learn and think, and they experiment with their ideas using robots. Brooks and his team focus on humanoid robots because they feel that being able to experience the world like human is essential to developing human-like intelligence. It also makes it easier for people to interact with the robots, which potentially makes k easier for the robot to learn.

Just as physical robotic design is a handy tool for understanding animal and human anatomy, AI research is useful for understanding how natural intelligence works. For some roboticists, this insight is the ultimate goat of designing robots. Others envision a world where we live side with intelligent machines and use a variety of lesser robots for manual labor, health care and communication. A number of robotics expert predict that robotic evolution will ultimately turn us into cyborgs - humans intelligent with machines. Conceivably, people in the future could load their minds into a sturdy robot and live for thousands of years!

In any case, robots will certainly play a larger role in our daily lives in the future. In the coming decades, robots will gradually move out of

the industrial and scientific worlds and into daily life, in the some way that computers spread to the home in the 1980s.

Unit 5

I. Переведите следующие интернациональные слова на русский язык.

а) без словаря
Basic, illustration, sensor, version, effectively, extraordinary.

б) со словарем
Controller, autonomous, navigate, marker, maneuver, adaptability, niche, camera.

II. Переведите на русский язык сочетания слов, пользуясь «правилом ряда».

Bumper sensor
Stereo vision
Animal echolocation
Image recognition software
Certain terrain patterns
An alternative robot design
Robot developer kits
Fairly specific purpose

III. Определите по суффиксу, к какой части речи относятся следующие слова и переведите их на русский язык.

Independent, basic, based, finally, bumper, direction, advanced, version, smarter, effectively, familiar, adaptability, vision, visual.

IV. Образуйте прилагательные от следующих слов. Переведите их на русский язык, обращая внимание на перевод словообразовательных префиксов.

Extra- сверх-, особо-, вне-, экстра-;
Infra- ниже-, под-, инфра-;
Multi- много-;
Over- сверх-, над-, чрезмерно-, пере-;
Ultra- сверх-, крайне-, ультра-;
Under- ниже-, под-, недо-, ниже чем-;

Extraordinary	Ultrasensitive
Extrasensory	Ultrasound
Extra-violet	Ultrasonic
Infrared	Overcharge
Infrastructure	Over-estimate
Multicolored	Overload
Multiform	Undervalue
Multinational	Undercooling

V. Образуйте множественное число от следующих существительных и переведите их на русский язык.

Formula, class, property, basis, stimulus, depth, analysis, datum, apparatus, index, phenomenon, medium, radius.

VI. Составьте сочетания из данных прилагательных и существительных и переведите словосочетания на русский язык.

Human	Idea
Artificial	Action
Intellectual	Abilities
Limited	Realms
Modern	Capacity
Basic	Experiment
Autonomous	Result

VII. Переведите следующие предложения, содержащие модальные глаголы. Постарайтесь правильно передать их модальность.

1. They can act on their own, independent of any controller.
2. Robots can effectively navigate a variety of environments.
3. Robots might also use microphones and smell sensors.
4. These robots may associate certain terrain patterns with certain actions.
5. Today it has to be taken seriously because scientists and engineers are indeed developing computers that can "think" in ways that humans do.
6. Most of todays computers can focus on only one thing at a time.
7. An office-cleaning robot might need a map of the building.
8. A rover robot might construct a map of the land based on its visual sensors.

VIII. Выполните полный письменный перевод следующего текста. Найдите в тексте модальные глаголы, сохраните модальность при переводе.

Текст

Autonomous Mobility

Autonomous robots can act on their own, independent of any controller. The basic idea is to program the robot to respond a certain way to outside stimuli. The very sample bump-and-go robot is a good illustration of how this work.

This sort of robot has a bumper sensor to detect obstacles. When you turn die robot on, it zips along in a straight line. When it finally hits an obstacle, the impact pushes in its bumper sensor. The robot's programming tells it to back tip, turn to the right and move forward again, in response to every bump. In this way, tire robot changes direction any time it encounters an obstacle.

Advanced robots use more elaborate versions of this same idea. Roboticists create new programs and sensor systems to make robots smarter and more perceptive. Today, robots can effectively navigate a variety of environments.

Simpler mobile robots use infrared or ultrasound sensors to see obstacles. These sensors work the same way as animal echolocation. The robot sends out a sound signal or a beam of infrared light and detects the signal's reflection. The robot locates the distance to obstacles based cm how long it takes the signal to bounce back.

More advanced robots use stereo vision to see the world around them. Two cameras give these robots depth perception, and image-recognition software gives them the ability to locate and classify various objects. Robots might also use microphones and smell sensors to analyze the world around them.

Some autonomous robots can only work in a familiar, constrained environment. Lawn-mowing robots, for example, depend on buried border markers to define the limits of their yard. An office-cleaning robot might need a map of the building in order to maneuver from point to point.

More advanced robots can analyze and adapt to unfamiliar environments, even to areas with rough terrain. These robots may associate certain terrain patterns with certain actions. A rover robot, for example, might construct a map of the land in front of it based on its visual sensors. If the map shows a very bumpy terrain pattern, the robot knows to travel another way. This sort of system is vary useful for exploratory robots that operate on other planets (check put JPL Robotics to learn more).

An alternative robot design takes a less structured approach - randomness. When this type of robot gets stuck, it moves its appendages every which way until sometimes works. Force sensors work very closely with the actuators, instead of the computer directing everything based on a program. This is something like an ant trying over an obstacle — it doesn't seem to make a decision when it needs to get over an obstacle, it just keeps trying things until it gets over it.

IX. Выполните реферативный перевод следующего текста, соблюдая требования, предъявляемые к данному виду перевода.

Текст

Adaptable and Universal

The personal computer revolution has been marked by extraordinary adaptability. Standardized hardware and programming languages let computer engineers and amateur programmers mold computers to their own particular purposes. Computer components are sort of like art supplies — they have an infinity numbers of uses.

Most robots today have been more like kitchen appliances. Roboticists build them from the ground up for a fairly specific purpose. They don't adapt well to radically new applications.

This situation may be changing A company called Evolution Robotics is pioneering the world of adaptable robotics hardware and software. The company hopes to carve out a niche for itself with easy-to-use "robot developer kits."

The kits come with an open software platform tailored to a range of common robotic functions. For example, roboticists can easily give their creations the ability to follow a target, listen to voice commands and maneuver around obstacles. None of these capabilities are revolutionary from a technology standpoint, but it's unusual that you would find them in one simple package.

The kits also come with common robotics hardware that connects easily with the software The standard kit comes with infrared sensors, motors, a microphone and a video camera. Roboticists put all these pieces together with a souped-up erector set — a collection of aluminum body pieces and sturdy wheels.

These kits aren't your run-of-the-mill construction sets, of course. At upwards of $700, they're not cheap toys. But they sore a big step toward a new sort of robotics. In the near future, creating a new robot to clean your house or take care of your pets while you're away might be as simple as writing a BASIC program to balance your checkbook.

Unit 6

I. Переведите следующие интернациональные и псевдо-интернациональные слова на русский язык. Определите случаи расхождения значения слов – ложных друзей переводчика.

Instruction, generation, endoscope, machine, correct, goal, console, design, technology, manufacture, camera, human, scale, locate, patient, manipulate, operation, apparatus, test, realise, examine.

II. Образуйте с помощью суффиксов слова, однокоренные с данными, определите, какой частью речи они являются и переведите их на русский язык.

A surgeon	To activate
To operate	Manufacture
To require	Manipulate
To instruct	Generate

III. Переведите следующие атрибутивные словосочетания. Определите способы перевода атрибутивных словосочетаний.

An input instruction	A surgical arm unit
A voice activation	A mechanical helping hand
An operating room	A robotic surgery field
A conventional surgery	A viewing and controle console
Optimal positioning robotic system	

IV. Переведите на русский язык названия изолированно и в предложениях.

- da Vinci Surgical System
- Zeus Robotic Surgical System
- AESOP Robotic System
- 3-D image

1. da Vinci Surgical System is the first robotic system allowed to be used in American operating room.
2. da Vinci uses technology that allows the human surgeon to get closer to the surgical site.
3. Zeus Robotic Surgical System has a similar set up, a computer workstation, a video display and hand controls.
4. Zeus Robotic Surgical System employs the assistance of the Automated Endoscopic System for Optimal Positioning Robotic System.
5. AESOP Robotic System was the first robot to be cleared by the FDA for assisting surgery.

V. Проанализируйте все – ing формы и определите функции слов с окончанием – ed. Переведите предложения на русский язык.

1. The first generation of surgical robots are already being installed in a number of operating rooms around the world.
2. They are lending a mechanical helping hand to surgeons.
3. There are some methods by which these surgical robots are controlled.
4. The goal is to design a robot that can be used to perform closed-chest beating-heart surgery.
5. Sitting at the control console, the surgeon looks into a viewfinder to examine the 3-D images being sent by the camera inside the patient.
6. Joystick-like controls, located underneath the screen, are used by the surgeon.

VI. Выполните полный письменный перевод следующего текста. Обратите внимание на способы перевода названий.

Текст

Robotic Surgeons

The first generation of surgical robots are already being installed in a number of operating rooms around the world. These aren't true

autonomous robots that can perform surgical tasks on their own, but they are lending a mechanical helping hand to surgeons. These machines still require a human surgeon to operate them and input instructions. Remote control and voice activation are the methods by which these surgical robots are controlled.

Robotics are being introduced to medicine because they allow for unprecedented control and precision of surgical instruments in minimally invasive procedures. So far, these machines have been used to position an endoscope, perform gallbladder surgery and correct gastroesophogeal reflux and heartburn. The ultimate goal of the robotic surgery field is to design a robot that can be used to perform closed-chest, beating-heart surgery. According to one manufacturer, robotic devices could be used in more than 3.5 million medical procedures per year in the United States alone. Here are three surgical robots that have been recently developed:

- da Vinci Surgical System
- ZEUS Robotic Surgical System
- AESOP Robotic System

On July 11, 2000, the U.S. Food and Drug Administration (FDA) approved the **da Vinci Surgical System,** making it the first robotic system allowed to be used in American operating rooms. Developed by Intuitive Surgical, da Vinci uses technology that allows the human surgeon to get closer to the surgical site than human vision will allow, and work at a smaller scale than conventional surgery permits. The $1 million da Vinci system consists of two primary components:

- A viewing and control console
- A surgical arm unit

In using da Vinci for gallbladder surgery, three incisions — no larger than the diameter of a pencil — are made in the patient's abdomen, which allows for three stainless-steel rods to be inserted. The rods are held in place by three robotic arms. One of the rods is equipped with a camera, while the other two are fitted with surgical instruments that are able to dissect and suture the tissue of the gallbladder. Unlike in conventional surgery, these instruments are not directly touched by the doctor's hands.

Sitting at the control console, a few feet from the operating table, the surgeon looks into a viewfinder to examine the 3-D images being sent by the camera inside the patient. The images show the surgical site and the

two surgical instruments mounted on the tips of two of the rods. Joystick-like controls, located just underneath the screen, are used by the surgeon to manipulate the surgical instruments. Each time one of the joysticks is moved, a computer sends an electronic signal to one of the instruments, which moves in sync with the movements of the surgeon's hands.

Another robotic system that is close to being cleared by the FDA is the ZEUS System, made by Computer Motion, which is already available in Europe. However, both the da Vinci and ZEUS systems must receive governmental approval for each procedure that a surgeon plans to use it for. The $750,000 ZEUS has a similar set up to that of the da Vinci. It has a computer workstation, a video display, and hand controls that are used to move the table-mounted surgical instruments. While the ZEUS system has not yet been cleared for American use beyond clinical trials, German doctors have already used the system to perform coronary bypass surgery.

The ZEUS system employs the assistance of the Automated Endoscopic System for Optimal Positioning **(AESOP)** Robotic System. Released by Computer Motion in 1994, AESOP was the first robot to be cleared by the FDA for assisting surgery in the operating room. AESOP is much simpler than the da Vinci and ZEUS systems. It's basically just one mechanical arm, used by the physician to position the endoscope - a surgical camera inserted into the patient. Foot pedals or voice-activated software allow the physician to position the camera, leaving his or her hands free to continue operating on the patient.

Unit 7

I. Переведите следующие интернациональные слова на русский язык и обратите внимание на их перевод.

1) без словаря

an anesthesiologist, automation, personnel, delicate, react, trauma, compensate, ignore

2) со словарем
fatigue, tremor, interaction, abnormality, correct, major, tele-surgery

II. Переведите следующие атрибутивные словосочетания на русский язык. Обратите внимание на способы их перевода.

a delicate surgery
a major obstacle
a doctor's hand movements
health care
cost efficiency
enhanced precision
heart bypass surgery
a 1-foot long incision
a human guidance

III. Определите по суффиксу, к какой части речи относятся слова и переведите их на русский язык.

simpliest, automation, surgical, eventually, eleminate, need, only, empty, outside, delicate, possible, console, movement, nearly, ability, lower, conventional.

IV. Подберите к данным глаголам соответствующие существительные, переведите сочетания на русский язык.

perform	fatique
decrease	andvantages
offer	operations
correct	surgery
require	abnormalities
accomplish	possibility
involve	precision
eliminate	computer console

V. Проанализируйте все – ing формы, определите функции слов с окончанием – ed.

1. In today's operating rooms, you'll find two or three surgeons, an anesthesiologist and several nurses, all needed for even the simplest of surgeries.
2. Taking a glimpse into the future, surgery may require only one surgeon, an anestheologist and one or two nurses.
3. The doctor will sit at a computer console, using the surgical robot for an operation.
4. The next step would be performing surgery from locations that are farther away.
5. Having fewer personnel in the operating room and allowing doctors the ability to operate on a patient long – distance could lower the cost of health care.
6. Robotic surgery has other advantages, including enhanced precision and reduced trauma to the patient.
7. It is possible to operate on the heart by making small incisions in the chest.

VI. Переведите следующие предложения, содержащие модальные глаголы. Постарайтесь правильно передать модальность при переводе.

1. In future, surgery may require only one surgery, an anestheologist and one or two nurses.
2. The doctor doesn't have to stand over the patient to perform the surgery, and can control the robotic arms a few feet from the patient.
3. The doctor must be in the room with the patient for robotic systems to react instantly to the doctor's hand movements.
4. Fewer personnel and the ability to operate on a patient long – distance could lower the cost of health care.
5. Surgeons can become exhausted during those long surgeries, and can experience hand tremors as a result.
6. Even the steadiest of human hands cannot match those of a surgical robot.

7. It could be that in this century a robot will be designed that can locate abnormalities in the human body, analyze them and operate them without any human guidance.

VII. Выполните полный письменный перевод. Обратите внимание на перевод модальных глаголов.

Текст

Advantages of Robotic Surgery

In today's operating rooms, you'll find two or three surgeons, an anesthesiologist and several nurses, all needed for even the simplest of surgeries. Most surgeries require nearly a dozen people in the room. As with all automation, surgical robots will eventually eliminate the need for some of that personnel. Taking a glimpse into the future, surgery may require only one surgeon, an anesthesiologist and one or two nurses. In this nearly empty operating room, the doctor will sit at a computer console, either in or outside the operating room, using the surgical robot to accomplish what it once took a crowd of people to perform.

The use of a computer console to perform operations from a distance opens up the idea of **tele-surgery,** which would involve a doctor performing delicate surgery miles away from the patient. If the doctor doesn't have to stand over the patient to perform the surgery, and can remotely control the robotic arms at a computer station a few feet from the patient, the next step would be performing surgery from locations that are even farther away. If it were possible to use the computer console to move the robotic arms in **real-time,** then it would be possible for a doctor in California to operate on a patient in New York. A major obstacle in tele-surgery has been the movements. Currently, the doctor must be in the room with the patient for robotic systems to react instantly to the doctor's hand movements.

Having fewer personnel in the operating room and allowing doctors the ability to operate on a patient long-distance could lower the cost of health care. In addition to cost efficiency, robotic surgery has several other advantages over conventional surgery, including enhanced precision and reduced trauma to the patient. For instance, heart bypass surgery now requires that the patient's chest be "cracked" open by way of a 1-foot (30.48-cm) long incision. However, with the da Vinci or ZEUS

systems, it is possible to operate on the heart by making three small incisions in the chest, each only about 1 centimeter in diameter. Because the surgeon would make these smaller incisions instead of one long one down the length of the chest, the patient would experience less pain and less bleeding, which means a faster recovery.

Robotics also decrease the fatigue that doctors experience during surgeries that can last several hours. Surgeons can become exhausted during those long surgeries, and can experience hand tremors as a result. Even the steadiest of human hands cannot match those of a surgical robot. The da Vinci system has been programmed to compensate for tremors, so if the doctor's hand shakes the computer ignores it and keeps the mechanical arm steady.

While surgical robots offer some advantages over the human hand, we are still a long way from the day when autonomous robots will operate on people without human interaction. But, with advances in computer power and artificial intelligence, it could be that in this century a robot will be designed that can locate abnormalities in the human body, analyze them and operate to correct those abnormalities without any human guidance.

VIII. Выполните аннотационный перевод следующего текста, соблюдая требования, предъявляемые к данному виду перевода.

Аннотация – это короткая, сжатая характеристика содержания и перечень основных вопросов статьи.

Структура аннотации:

1. Вводная часть, включающая название статьи, фамилию и имя автора, название журнала, место издания и т.д.
2. Описательная часть, называющая тему и содержащая перечень основных положений статьи или сжатую характеристику материала.
3. Заключительная часть – подытоживающая изложение автора.

Текст

Homebrew Robots

In the last couple of sections, we looked at the most prominent fields is the world of robots — industry robotics and research robotics. Professionals in these fields have made most of the major advancements in robotics over the years, but they aren't the only ones making robotics. For decades, a small but passionate of band of hobbyists has been creating robots in garages and basement all over the world.

Homebrew robotics is rapidly expanding subculture with a sizeble Web presence. Amateur roboticists cobble together their creations using commercial robot kits, mail order components, toys and even old VCRs.

Homebrew robots are as varied as professional robots. Some weekend roboticists tinker with elaborate walking machines, same design their own service bots and others create competitive robots. The most familiar competitive robots are remote control fingers like you might see on "BattleBots." These machines aren't considered "true robots" because they don't have reprogrammable computer brains. They're basically souped-up remote control cars.

More advanced competitive robots are controlled by computer. Soccer robots, for example, play miniaturized soccer with no human input at all. A standard soccer bot team includes several individual robots that communicate with a central computer. The computer "sees" the entire soccer field with a video camera and picks out its own team members, the opponent's members, the ball and the goal based on their color. The computer processes this information at ever second and decides how to direct its own team.

Unit 8

I. Переведите следующие интернациональные слова на русский язык. Определите случаи расхождения значений слов – «ложных друзей переводчика».

Bulldozer, situation, bomb, miniature, compass, role, configuration, chassis, detector, temperature, package, radiation, sort, reason, film, tank.

II. Переведите следующие а трибутивные группы слов, используя разные способы перевода.

Ground vehicle, assault robot, tank treads, miniature tank treads, surveillance data, audio and video surveillance, audio and video surveillance system, robot sensor, robot sensor package, base configuration parameters, four-wheel all-terrain vehicle, fire department, safety officials, staff member.

III. Переведите следующие слова на русский язык, обращая внимание на перевод отрицательных приставок.

Un – human, detected, manned, controllable, developed, exploded, available, capable, reliable, realized, successful, common.
In – exact, essential, experienced, famous, explainable, explosive, discriminate.
Dis – quiet, comfort, connect, courage, continue.

IV. На основе словообразовательных элементов , переведите слова, образованные от одного корня:

1. Locate, locality, location, local, localize, localization, locally.
2. Decide, decision, decisive, decisively, decided, decidedly.
3. Port, portable, portal, portability, portage.
4. Maneuver, maneuverable, maneuverability, maneuvering.

V. Переведите следующие терминологические словосочетания, состоящие из существительного, причастия II и существительного на русский язык:

Manipulator-controlled device.
Object-oriented architecture.
Knowledge-based robot.
Time-shared system.
Computer-aided design.
Sketcher-based features.

VI. Переведите следующие терминологические словосочетания, состоящие из существительного, причастия I (герундия) и существительного на русский язык:

List-processing language.
Path-following motion.
Motion-planning computer.
Chess-playing machine.
Path-tracking velocity.

VII. Переведите следующие терминологические словосочетания, состоящие из существительного, прилагательного и существительного на русский язык:

Man-portable robot.
Graphics-capable terminal.
Pressure-sensitive tablet.

VIII. Переведите предложения, обращая внимание на многозначность слова «term». Существительное «term» может переводиться - срок, семестр, условие. Сочетание in terms of переводится – «в понятиях», «на языке», «на основе», «в зависимости от», «в значениях».

1. Using this robot one can get more in terms of effectiveness.
2. There are two terms in each academic year.
3. In correct usage the term "computer" usually refers to high speed digital computers.

4. The President is elected for a four-year term.
5. We could not accept these terms. They were not to our advantage.
6. We should change our technique in terms of new requirements.
7. In terms of upgrading, high-performance systems have a key advantage.
8. In the long term, the facility that game players develop with computer graphics could help much in their future career.

IX. Переведите следующие словосочетания на русский язык,постарайтесь выбрать правильные значения многозначных слов с помощью узкого контекста.

1. regular intervals, regular features, regular army, regular work, regular readers, regular staff member.
2. primitive people, primitive art, primitive operations, primitive cause, primitive colors, primitive ideas, primitive tools.

X. Подберите к существительному в правой колонке соответствующее прилагательное в левой. Переведите сочетания на русский язык.

Chemical	Applications
Hostile	Sensors
Aerial	Uses
Difficult	Detection
Civilian	Buildings
Possible	Vehicle
Military	Terrain
Various	Task
Dangerous	Configurations

XI. Переведите следующие предложения, содержащие инверсию. Перевод таких предложений следует начинать со слов, стоящих после вынесенной на первое место части сказуемого, а затем перейти к переводу самого сказуемого.

1. ***Shown in this picture*** is a new rescue robot.

2. ***Associated with the processor*** is the computer's memory.
3. ***Of primary importance to us at present are*** ecological problems.
4. ***Disquieting to many people is*** the thought that the robot will go out of control.
5. ***Described in this chapter is*** the architecture of a new processor.
6. ***Also of interest commercially is*** the development of expert systems.

XII. Проанализируйте придаточные условные предложения. Обратите внимание на инверсию. Переведите предложения на русский язык.

a)

1. If they describe the process in greater detail, it will be easier to make a correct conclusion.
2. If someone could program a computer robot (like the ones in a Star Wars) to do five tasks for you on a regular basis, what would you like the robot to do and why?
3. It would be rather unexpected if he did the work by himself.
4. They could have shown us their results provided they had done the work.
5. You wouldn't succeed in carrying out the experiment unless you took into consideration every detail.
6. Even if a robot with a gun were allowed to operate on its own and it did go out of control, the push of a button on the control unit is all that would be needed to reboot the robot to the safe mode.

b)

1. Had they foreseen this error, they would have tried to avoid it.
2. Had they more reliable equipment they would supply us with better devices.
3. Were the computers able to foresee possible mistakes, the task of the programmer would be much simpler.

4. Were you allowed to visit the laboratory, you would see wonders in the field of holography.
5. Had I had this information before, I would have used it in my report.

XIII. Переведите следующие предложения, содержащие инфинитив. Определите, в какой функции используется инфинитив.

1. Drivers may soon be able to use the computer in their cars to avoid endless traffic jams.
2. For years scientists have used computers to try and create artificial intelligence by mimicking a human brain electronically.
3. In Europe, plans to create a continent wide database that would contain information about terrorists, criminals and illegal immigrants have triggered objections from civil rights groups and others.
4. Criminal cases against hackers are often lost because although it is easy to prove intentional access, it is almost impossible to prove intentional damage.
5. Today's personal computing world is very different from the world of only 10 years ago. No one wants to be left behind watching everyone else move up to the new technology standards.
6. To master these software packages one should be a skillful designer.
7. Automotive and aerospace companies were the first to use CAD.
8. To choose a good Internet Service Provider can be difficult.

XIV. Проанализируйте предложения с инфинитивным оборотом «сложное дополнение» и переведите их на русский язык.

1. The distinctive feature of this invention was that it allowed the designer to interact with (the) computer graphically.
2. Multiple data pipelines let the microprocessors do more than one thing at a time.

3. A great variety of choices being offered required you to know enough about microcomputers to make an intelligent choice.
4. CAD enables companies to produce better designs that are almost impossible to do manually.
5. The results obtained do not permit any conclusion to be drawn.
6. The prospect of this competition made some teams upgrade their robot designs.
7. Increasing dependence of people and events on both a national and international scale forced us to create systems that can respond immediately to dangers, enabling appropriate defensive or offensive actions to be taken.
8. The introduction of analytical methods allowed the solution of a number of complicated mathematical problems to be greatly simplified.

XV. Выполните полный письменный перевод текста, обращая внимание на употребление условных придаточных предложений:

Текст

How Military Robots Work

Everyone knows that being a soldier is a dangerous job, but some of the tasks that soldiers are required to do are more dangerous than others. Walking through ***minefield***, deactivating unexploded bombs or clearing out ***hostile*** buildings, for example, are some of the most dangerous tasks a person is asked to perform in the line of ***duty***.

What if we could send robots to do these jobs instead of humans? Then, if something went wrong, we'd only lose the money it cost to build a robot instead of losing the human life. And we could always build more robots. Described in this text are robot soldiers and sorts of jobs they can do.

The military doesn't use the kinds of humanoid ***assault robots*** we've come to expect from films like "The Terminator". Whether or not a robot looks like a human doesn't matter much in today's military applications. Robots come in many shapes and sizes, and although there isn't really

any single definition of a robot, one common definition is this: a machine that is controlled in whole or in part by an onboard computer.

Robots also have sensors that allow them to get information from their surroundings, some form of locomotion and a power ***source***.

The shapes of military robots depend on the kinds of jobs they are built to carry out. Robots that have to ***negotiate*** difficult ***terrain*** use tank ***treads***. Flying robots look pretty much like small airplanes. Some robots are the size of ***trucks***, and they look very much like trucks and bulldozers. Other, smaller robots have a very low profile to allow for great ***maneuverability***. Today's military robots don't do much on their own. Their computer brains aren't very sophisticated ***in terms of*** artificial intelligence. Instead of independent AI, most military robots are ***remote-controlled*** by human operators. The military doesn't usually use the term Robot – it calls them ***unmanned ground vehicles*** (UGVs) or ***unmanned aerial vehicles*** (UAVs).

One other important thing to remember about military robots: robots designed to help soldiers on the battlefield have to be carried onto the battlefield by those soldiers. For that reason robot builders try to design ***man-portable*** robots. A man-portable robot can be carried by a single soldier, usually in a special backpack.

The most common robots currently in use by the military are small, flat robots mounted on miniature tank treads. These robots are ***tough***, able to ***tackle*** almost any terrain and usually have a variety of sensors built in, including audio and surveillance and chemical detection. These robots are versatile with different sensor or weapon packages available that mount to the main chassis. The Talon is one of such robots. It weights 5 kg in its ***base configuration***. Talon is designed to be very durable, besides, it is amphibious. Talon is operated with a joystick control, has seven speed settings (top speed is 1, 8 meters per second and can use its treads to climb stairs, maneuver through rubble and even take on snow. Versatility has been designed into the Talon as well with multiple possible configurations available that adapt the robot to the situation at hand. The basic Talon includes audio and video listening devices and mechanical arm. All Talons are now equipped with chemical, gas, temperature and radiation sensors.

The military is even running tests on Talons that carry guns. The Packbot is another man-portable robot which is designed to fit into a standard pack. Controlled by a Pentium processor that has been designed

specially to withstand rough treatment, Packbot's chassis has a GPS system, an electronic compass and temperature sensors built in.

The thought of robots motoring around with deadly weapon systems mounted on them is disquieting to many people. Could a robot ***go berserk*** and start shooting at people indiscriminately? Military officials and robot designers say this is almost impossible. The robots don't operate autonomously very often, relying on remote human operators most of the time. Even if a robot with a gun were allowed to operate on its own, and it did go out of control, the push of a button on the console unit is all that would be needed to reboot the robot to the safe mode.

Military robots have civilian uses as well. Law enforcement agencies, safety officials and fire departments use such robots to disarm and detonate explosives. Industrial fires can be deadly for firefighters because they can never be sure if there are explosive chemicals involved. Sending in a robot to check it out can save lives. There is a good chance to make a robot a regular staff member.

XVI. Выполните реферативный перевод текста в соответствии с требованиями, предъявляемыми к этому виду перевода.

Текст

Robots to the Rescue with the Aid of a Dummy That Can Feel Our Pain

The adult-sized doll, which is named "Damitaro" and resembles an elderly Japanese man, will be used to develop a breed of robots capable of rescuing human beings after natural disasters without injuring them further.

The mannequin, which has a rubber skin covered in 850 ultra-sensitive pads, is the centerpiece of this year's meeting of Japan's Robotics Society and a critical part of Japan's International Rescue Systems (IRS) project — a program aimed at preparing Japan for a massive earthquake that many seismologists consider to be inevitable. Japan remains haunted by the quake that devastated Kobe in 1995, claiming more than 6,000 lives.

The pain sensors are just a few hundredths of a millimeter thick and register even the slightest pressure on the skin, or twisting of the bones. The readings are sent to a computer and are compared with normal

human reactions to the same forces. An image of Damitaro's body appears on the screen, with the areas of most pain marked in the darkest colors.

The mannequin is the creation of Yasuhiro Masutani of Osaka University. It is a response to the success of Japan's robotics engineers, who have built robots that can make their way through rubble and assist human rescue workers by locating survivors.

Machines such as the snake-shaped IRS Soryu can work its way into pockets of wreckage where people would not be able to go. It can be equipped with cameras, heat detectors and even a device to seek out mobile phone signals.

More recently the IRS's arsenal has developed metallic creatures with names such as Elastor, Ninja and Titan — robots that should eventually be able to delve independently into ruined buildings and retrieve survivors. Tests have begun on rescue robots capable of carrying a human in their arms and on a robotic "power suit" that will assist rescuers in moving heavy obstacles.

Damitaro's role will be to lie among the twisted girders of a mock ruin and educate his mechanical saviors in how much wrenching an injured human being can take when he is being rescued. Doctors will evaluate whether Damitaro has been handled too violently, or whether the new robot recruits are simply too clumsy to be useful.

The IRS has pinned its hopes on robot rescuers because of the experience of Kobe. The first three days after a big quake or disaster are known as the "72 golden hours" and represent the time that it takes for survival rates among those trapped under a collapsed building to be reduced dramatically. The sense of urgency has been fuelled by a recent Cabinet Office report, which estimated that 30per cent of the country's 44 million houses would not survive a quake as big as Kobe.

Unit 9

I. Переведите следующие интернациональные слова на русский язык. Определите случаи расхождения значений слов – «ложных друзей переводчика».

Analysis, assembly, evolution, space, virtual, complex, panel, direction, reflection, animation, formulas, parameter, section, group, mass, automatically, panel, manufacture

II. Переведите следующие атрибутивные группы слов, используя разные способы перевода.

Design evolution, assembly model, solid modeling, mass property multitask modeling, surface description, software package, curvature change, curvature change rate, reference surface description, key body positions, solid modeling software package

III. Переведите следующие слова:
с приставкой *semi-*, соответствующей русской приставке *полу-*, с приставкой *self-*. В сложных словах *self-* выражает направленность действия на самого себя или автоматический характер действия.

a. Semi-automatic, semicircle, semiconductor, semi diameter

b. Self-acting, self-adjusting, self-feeding, self-regulating

IV. При помощи следующих суффиксов образуйте прилагательные от существительных и глаголов и переведите их на русский язык.

-able	program, afford, apply, change
-ible	vision, access
-ive	production, creation, intuition, description, progress, repetition, reflection
-ous	continue, vary

-ful power, skill

V. Переведите следующие слова на русский язык, обращая внимание на значения приставки "–pre". *Приставка pre- соответствует русским приставкам до-, пред-, слову «заранее».*

Set, establish, arrange, determined, revolutionary, stressed, war, computed.

VI. При помощи суффикса "–ify" образуйте глаголы от следующих существительных и переведите их на русский язык.

Solid, electricity, purity, simplicity, intensity, satisfaction, magnification, liquid, identity

VII. На основе словообразовательных элементов переведите слова, образованные от одного корня:

1. assemble, assembly, assemblage, assembling, assembler, assembled
2. depend, dependence, dependent, dependency, dependability, dependable, independence
3. apply, application, applicant, applicable, applicator, applicatory, applied, applicative
4. excel, excellence, Excellency, excellent, excellently
5. continue, continuity, continuing, continuously, discontinuity

VIII. Образуйте глаголы от следующих существительных, обратите внимание на ударение. Переведите эти части речи на русский язык.

Transfer, permit, decrease, increase, contact, excess, progress, contract, present, export, import, update

IX. Переведите следующие словосочетания на русский язык. Постарайтесь выбрать правильные значения многозначных слов при помощи узкого контекста.

1. Solid block, solid ground, solid man, solid line, solid foundation, solid engine, solid geometry, solid argument, solid animation, solid party, solid firm
2. advanced ideas, advanced opinions, advanced technology, advanced software, advanced age, advanced English course, advanced student

X. Составьте сочетания из данных глаголов и существительных и переведите их на русский язык.

To modify	a hub
To create	a surface
To relocate	animation
To define	features
To add	changes
To rebuild	models
To describe	parameters
To maintain	a new cut
To master	a software package
To reflect	a mental 3D image

XI. Переведите предложения на русский язык, обращая внимание на многозначность слова "case". Существительное "case"переводится – «дело», «случай», «довод», «обстоятельство. This is the case – это имеет место, это происходит.

1. The firm will not expand its staff as it was the case last year.
2. Early people thought that the Earth was flat but that was not the case.
3. In case of earthquakes, rescue robots will be very helpful.
4. It was not an easy task for the police to investigate the case.
5. Once atom was considered to be indivisible, but it is not the case.
6. Scientists predicted bewildering development of information technologies and it is really the case.

7. In any case you should insist on your terms.

XII. Переведите следующие предложения на русский язык, обращая внимание на многозначность слова "involve". Глагол "to involve" переводится – «влечь за собой», «включать в себя», «подразумевать», «предполагать».

1. Computer-aided design involves both software and special purpose hardware.
2. This chapter deals with the general principles involved in the operations of sensors.
3. Engineers tried to take into consideration all the factors involved in the development of new chips.
4. The research involved aims at searching for cost-effective technologies.
5. The problem involved required thorough consideration.
6. The first assignments of the technical committee involve coming up with standards for 200 GB recordable disc and 100 GB read-only disc.

XIII. Проанализируйте предложения с инфинитивным оборотом «сложное подлежащее». Переведите предложения на русский язык.

1. Today's CAD software systems are considered to be founded on Euclid's postulates and axioms.
2. Most robots are believed to have not very sophisticated brains.
3. Because of high cost of early computers and the unique mechanical engineering requirements of aircraft and automobiles large airspace and automotive companies are stated to have been the earliest users of CAD software.
4. Information technologies are certain to be changing all the spheres of our life.
5. The explosion of information now available to us is sure to expand our view of the world.
6. The trend of increased computer power at lower cost is likely to continue.

7. Microprocessors are known to perform all necessary calculations and manipulations to transform data into meaningful information.
8. Laptops were found to be the third most popular gadget in Britain after digital cameras and mobile phones.
9. Leonardo da Vinci is said to have built a mechanical lion to greet the king of France on his visit to Milan in 1507
10. Computers were supposed to create the paperless office, but they don't seem to have worked that way.

XIV. Выполните полный перевод текста, обращая внимание на употребление инфинитивного оборота «сложное подлежащее».

Текст

Solid Modeling CAD

Solid modelers have become commonplace in engineering departments in the last ten years due to faster PCs and ***competitive*** software pricing.

Solid modeling software creates a Virtual Reality for machine design and analysis. Interface with the human operator is highly optimized and includes programmable macros, keyboard shortcuts and dynamic model manipulation. The ability to dynamically re-orient the model, in Real-time shaded 3-D, is emphasized and helps the designer maintain a mental 3-D image.

The designer generally has access to models that others are working on concurrently. For example, several people may be designing one machine that has many parts. New parts are added to an assembly model as they are created. Each designer has access to the assembly model, while the work is ***in progress***, and while working in their own parts. The design evolution is certain to be visible to everyone ***involved***.

A solid model generally consists of a group of features, added one at a time, until the model is complete. Engineering solid models are built mostly with ***sketcher-based features***; 2-D sketches that are swept along a path to become 3-D. These may be cuts or extrusions for example.

Another type of modeling technique is ***'surfacing'***. Here, surfaces are defined, trimmed and merged, and filled to make solid. The surfaces are usually defined with datum curves in space and a variety of complex

commands. Surfacing is more difficult, but better applicable to some manufacturing techniques, like ***injection molding.*** Solid models for injection molded parts usually have both surfacing and sketcher based features.

Another example of where surfacing ***excels*** is automotive body panels. If two curved areas of the panel have different ***radii*** of curvature and are blended together, maintaining tangential continuity (meaning that the blended surface doesn't change direction suddenly, but smoothly) won't be enough. They need to have a continuous rate of curvature change between the two sections, or else their reflections will appear disconnected.

Engineering drawings are created semi-automatically and reference the solid models. To master these software packages is rather difficult but a fluent machine designer who can do it is highly productive.

Parametric Solid Modeling

A revolution in 3-D cad began in 1989 when the first parametric modeler, T-FLEX was released for the pc. Most solid modelers are now parametric.

Parametric modeling is known to use parameters to define a model (dimensions, for example). The parameter may be modified later, and the model will update to reflect the modification.

Example: A shaft is created by extruding a circle 100mm. A hub is assembled to the end of the shaft. Later, the shaft is modified to be 200mm long (click on the ***shaft***, select the length dimension, modify to 200). When the model ***is updated*** the shaft will be 200mm long, the hub will relocate to the end of the shaft to which it was assembled, the engineering drawings and mass properties will reflect all changes automatically.

Examples of parameters are: dimensions used to create model features, material density, formulas to describe swept features, imported data (that describe a reference surface, for example).

Parametric modeling is obvious and intuitive. But for the first three decades of cad this was not the case. Modification meant re-draw, or add a new cut or protrusion on top of old ones. ***Dimensions*** on engineering drawings were *created*, instead of *shown*.

Parametric modeling is considered to be very powerful, but requires more skill in model creation. A complicated model for an injection

molded part may have a thousand features, and modifying an early feature may ***cause*** later features to fail. Skillfully created parametric models are easier to maintain and modify.

Parametric modeling also lends itself to data re-use. A whole family of cap screws can be contained in one model, for example.

Animation of a computer generated character is sure to be an example of parametric modeling. Characters in ***animated cartoons*** are often described by parameters which ***locate*** key body positions. The models are then built of these locations. The parameters are modified, and the models rebuilt for each frame to create animation.

XV. Сравните два текста, найдите в переводе ошибки.

An Imaginary Tour.	**Воображаемое путешествие.**
Architects can now "walk" clients through a new building long before the foundation is even poured – thanks to the new computer-aided design programs. Clients have the opportunity to make changes and to see the results almost instantly. Want three windows rather than two? Wonder what the room would look like if the door was a little to the left? How would the room "feel" if the walls were brick rather than wood? Today it's no problem.	Архитекторы могут теперь «гулять» вместе с клиентами по новому зданию задолго до закладки фундамента – благодаря новым ПАП. Клиенты имеют возможность вносить изменения и почти немедленно видеть результат. Хотите три окна? Интересно, как выглядела бы комната, если дверь немного переместить влево? Как бы комната «чувствовалась», если бы стены были кирпичные, а не деревянные? Сегодня это не проблема.
The process of building a model of a room on a computer has several stages. First the architect sets the objects in space and defines their characteristics, such as a shape of surface finish. Then a perspective of the room is	Процесс создания модели комнаты на компьютере имеет несколько стадий. Сначала архитектор устанавливает объекты в пространстве и определяет их характеристики, например тип отделки поверхности. Когда перспектива комнаты выбрана, компьютер может показать, как

chosen so the computer can orient the view it will create. What can and cannot be seen must be calculated, as well as angle reflections, color, and intensity of light. The result can either be viewed on a computer screen, printed, or put directly onto a color slide. The program can let people "walk" through famous buildings on the other side of the world.	будет выглядеть созданная им комната. Что можно и что нельзя увидеть должно быть рассчитано точно также как угол, отблески, цвет и интенсивность света. Результат можно посмотреть на экране компьютера, напечатать или поместить прямо на цветной слайд. Программа также позволяет людям «гулять» по знаменитым сооружениям, даже если они расположены на другом конце света.

Unit 10

I. Переведите следующие интернациональные слова на русский язык. Определите случаи расхождения значения слов «ложных друзей переводчика».

a) без словаря:
laboratory, copy, mass, telemedicine, present, deformation, risk, stop, intuitively, scale, phase, metal, address, tactile, patient, contour.

b) со словарем:
object, probe, accurate, complex, clay, sensation, simulate, examine.

II. Переведите на русский язык атрибутивные группы, используя различные способы перевода.

Object deformation, model features, surface texture, surface texture simulation, surface texture simulation process, user performance, user

performance enhancement, clay and foam modeling skill, force feedback, entertainment software industry.

III. Определите, что объединяет эту группу существительных, образуйте от них глаголы и переведите их.

Mirror, point, scale, force, cause, move, sense, touch, hop, land, arm, trace, dimension, benefit.

IV. Переведите следующие глаголы на русский язык, обратите внимание на то, что перевод словообразовательного префикса *re*, означает повторность действия (снова, заново, еще раз, по-новому). Дайте все варианты перевода.

Reform, refound, reorder, reorient, rescale, reoccupy, renumber, recreate, recharge, reorganize, reoccupy, reboot.

V. На основе словообразовательных элементов определите, к каким частям речи относятся следующие слова и переведите их на русский язык.

Operate, operation, operator, operating, operational, operationability, operative.
Represent, representation, representability, representativeness, representativity.
System, systematize, systemize, systematization, systematic, systematist, systematically, systemless.
Mechanics, mechanize, mechanism, mechanical, mechanically, mechanization.

VI. Переведите следующие словосочетания на русский язык, постарайтесь выбрать правильное значение многозначных слов при помощи узкого контекста.

1. **Special** feature, **special** interests, **special** reason, **special** training in some field, **special** privilege, **special** mission, **special** correspondent, **special** case.

2. **Sophisticated** tools, **sophisticated** taste, **sophisticated** research techniques, **sophisticated** traveller, **sophisticated** text, **sophisticated** manners.

VII. Переведите следующие предложения на русский язык, обращая внимание на выделенные части речи.

1. To deliver a more natural **experience** this technology engages a third sense - touch. Our plants **experience** great difficulties, because they lack up-to-date equipment. His life **experience** helped him to withstand a lot of hardships.
2. By exerting more pressure the user can cause deformation of the **object**. We **object** to his taking part in this research.
3. To locate and **clear** land mines is risky business. The **clear** advantage of this system is its novelty. 1 should make **clear** that my point of view is an unconventional one.
4. At the World Expo in Nagoya robot Wakamam will **address** visitors in four languages. 1 couldn't write to you because I had lost your **address**. After the president had delivered his opening **address**, the congress began its work.
5. He has made great **progress** in studying English. Preparations for a set of new experiments in our laboratory are in **progress**. The **progress** in the development of robotics all over the world is evident. How far has AI been able to **progress** to date?
6. The experimental **results** will soon be published in a new issue of this journal. An excellent agreement between the model calculations and actual parameters **results**. The progress in electronics has **resulted** in the inventions of computers. These achievements **result** from a complete change of methods of work of our research team.

VIII. Переведите следующие предложения на русский язык, обращая внимание на многозначность слова «once» (однажды, если, когда, как только, «at once» – сразу).

1. Once data is in a microcomputer it is processed by the microprocessor and its associated integrated circuit chip.

2. Once entered, data is moved to memory for processing.
3. It is surprising how simple many problems of physics become, once the meaning of each concept involved is completely understood.
4. His ideas seemed so strange at first that they were not accepted at once.
5. Once the goal was clear, the collaboration of scientists expanded.
6. Once the robot scientist had conducted initial tests it used the outcomes to make a subsequent set of guesses.
7. Once a bot has hardware that can see reliably, it needs software that can think and steer.

IX. Переведите предложения на русский язык, обращая внимание на многозначность слова «provide» (давать, обеспечивать, снабжать, представлять собой; provided (that) при условии, если только, при условии, что...)

1. We are going to discuss the results of the experiments provided by our research laboratories.
2. The internet provides a vast and diverse source of information.
3. The hard disk provides greater storage space than a floppy disk.
4. The provision for environment protection at present is a problem to be solved.
5. Provided the instruments are up-to-date and reliable, our experiments will be successful.
6. We could have given a proper answer to your question provided we had had more time.
7. With so many users in the Internet and their number is growing by 200 percent annually it certainly provides new challenges for the telephone companies.
8. Provided (that) there are no objections we'll go on our discussions.
9. Unix provides multitasking which allows simultaneous programs to be shared by several users at one time.

X. Проанализируйте следующие предложения, содержащие герундий и герундиальные обороты. Переведите предложения на русский язык.

a.

1. Moving along a surface provides tactile information about the surface texture.
2. Protecting data from electronic invaders is a very serious problem.
3. It is worth remarking that TouchSense technology is very unusual.
4. This device is capable of tracking changes in body temperature.
5. Planning is the single most important step in creating a successful database.
6. Microcomputers are the logical choice of computer studies today because they are capable of performing so many tasks that are relevant to modern workplaces, schools and houses.
7. Without having improved the properties of this material one can not expect getting better results.
8. There are a lot of ways of improving this project.

b.

1. It is evident that there is no hope of our finding a proper solution to the problem at present.
2. We know of Lobachevsky's having developed a new geometry different from that of Euclid.
3. We insisted on their following the usual procedure.
4. Besides its being used as an everyday word the term "work" has a special meaning in mechanics.

XI. Выполните полный письменный перевод текста, обращая внимание на перевод герундия и герундиальных оборотов.

Текст

TouchSense Fundamentally Changes the Way People Interact with Computers

When you sit down at a computer, you typically use two **senses**: sight and hearing. TouchSense technology engages a third sense—**touch**—to deliver a more natural **experience**. Instead of just **pointing at** elements on screen, the cursor becomes an extension of your hand. The world inside your computer takes on realistic textures to deliver sensations you can feel.

Game players are rewarded with a richer, more realistic experience. Shopping online? What if you could touch items before making your purchase? The applications of TouchSense technology are endless, with benefits for any computer user.

The scientists from Immersion Corporation began their research in TouchSense technology with 3D modeling and Computer Aided Design (CAD). Their first invention was a device that **traces** the contours of a physical object and then renders a 3D model of it on screen. Next, they decided to explore **tactile** communication in the other direction - from computer to human. The goal of the research was to make this breakthrough experience affordable for the average computer user. The work started by devising medical and scientific applications of TouchSense Technology that let doctors and medical students practice surgical procedures in a realistic, yet more cost-effective way. From there, it was a short hop to the entertainment software industry.

TouchSense devices are neither purely electronic nor simply mechanical. They're both. As electro-mechanical devices, they translate digital information into physical sensations. For example, when you push on a mouse or a joystick, the device pushes back—using magnetic actuators and sensors built into the device. Technically speaking, this process is called force feedback.

Touch is the human sense a computer can address. It's called **haptics**, from the Greek haptesthai, meaning to **grasp** or touch. The earliest haptic devices for computers were Braille readers. With them, a blind user can move his finger along a line of metal pins that form a Braille

representation of the current on-screen line of text. There are now a few more devices that use haptic technology. Among the earliest, developed a few years ago, were joysticks and similar gaming controls that employed force feedback.

The newest devices are haptic mice from Fremont, Calif.-based Logitech Inc. that use a vibration-generating motor to simulate different surface **textures** and materials.

But there are more sophisticated haptic tools available. Perhaps the best-known is the Phantom from SensAble Technologies Inc. in Woburn, Mass. This device employs a moving arm that ends in a stylus for the user to hold or a **thimble** into which the user inserts a finger.

These are used in conjunction with software called the FreeForm Modeling System. As the user moves the device's arm, a cursor moves around the screen. Using the device, if one encounters a "solid" object in the on-screen universe, the arm is stopped. Moving along a surface provides tactile information about the surface's texture, and the user can readily and intuitively sense curves and corners and, by exerting more pressure, cause deformation of the object.

Using "digital clay" as a sculpting medium, this system essentially does for clay and foam modeling what the word processor did for typing. The process may not be faster for creating the first object, but once that's captured, it can be manipulated, modified and rescaled digitally. The artist can copy and reuse model features, control the hardness and surface smoothness of the clay, and mirror and scale objects - and, of course, "undo" is just a keystroke away.

There are many potential practical applications for haptic devices in training people to develop and practice specific motor skills, such as in the field of medicine. One use is for training in surgical procedures. Another is in telemedicine, where a doctor can physically examine and palpate areas on a patient's body, receiving accurate and informative tactile feedback even though the patient and doctor are in different locations.

Locating and clearing land mines is risky business, but haptic technology can help significantly in training. The system presents the trainee with a basic representation of the area to be investigated, and, using a standard-issue military probe attached to the Phantom, he has to locate possible mines by gently inserting a virtual representation of the probe into the on-screen "ground."

Once a definite contact has been made, the trainee continues probing until a recognizable pattern of penetrations has been made. The clear advantage of the system is that it lets people make beginners' mistakes without being killed.

Haptics is also being investigated as a tool for analyzing data. Just as color and graphical representations have enhanced the ability to manipulate and understand masses of data, haptics may contribute to the ability to sense additional dimensions in a single view.

XII. Выполните аннотационный перевод текста, в соответствии с требованиями, предъявляемыми к данному виду перевода.

Текст

Smart Skin

One day, your baby monitor will alert you to a great deal more than a crying fit down the hall. Thanks to hundreds of tiny wireless sensors laced into your baby's clothing, you'll be alerted to the slightest changes in temperature, pulse, or movement. Whether your baby develops a fever or has trouble breathing, you'll know about it—in a matter of seconds.

At the University of Texas at Arlington, Zeynep Celik-Butler and Donald Butler are well on their way to creating that sort of all-knowing baby monitor. Just as other scientists are building flexible computer chips and displays, this husband and wife team is working to build flexible micro-sensors, tiny devices supple enough to sit inside a window curtain or an ordinary piece of clothing yet smart enough to detect changes in their immediate surroundings.

"We were watching all the work being done to build transistors and light-emitting diodes on flexible substrates," says Donald Butler, "and we thought, 'Why not put sensors on a flexible substrate as well?"

They call their project Smart Skin, and they've already demonstrated a prototype that monitors infrared radiation, which means it's also capable of tracking changes in body temperature. In the near future, they hope to build devices that respond to all sorts of other stimuli. "We plan to duplicate another sensing ability of the skin," says Zeynep Celik-Butler. "Creating devices that detect touch and pressure." Her husband envisions sensors that monitor changes in air flow, alerting you to, say, an open window or a gas leak.

Their prototype begins with a flexible polymer substrate that can withstand temperatures as high as 752° Fahrenheit. The higher the temperature, the easier it is to deposit the sensing materials on the substrate. In this case, the micro-sensors are made of yttrium barium copper oxide, a material that responds to infrared radiation.

The project, funded by the National Science Foundation, still has another five years to run. So we may be well into the next decade before such devices are commercialized. There are any number of places these sensors could reside, and any number of things they could monitor.

Woven into the uniform of a combat soldier, the sensors might detect toxic chemicals or bacterial agents floating through the air. Worn by a diabetic—just under the skin—they could track insulin and glucose levels. Donald Butler suggests they might soon find a home in the world of robotics. A NASA machine, for instance, could carefully track its surroundings as it moves across Mars or the moon. And then, of course, there's the baby monitor—with a capital M.

XIII. Сравните два текста, найдите ошибки в переводе.

It looks kind a familiar.	**Что-то знакомое...**
Imagine the Mona Lisa, the da Vinci painting with the tantalizing smile, with someone else's face. Imagine the image suddenly deconstructing electronically. By using an electronic scanner, artists can now incorporate images created by the great masters into their computer and then manipulate those images any way they wish - changing color, twisting the viewpoint. Artist Lillian Schwartz sometimes incorporates her own face into the picture, or she layers one image on top of another, resulting in a picture that is both familiar and	Представьте Мону Лизу, картину да Винчи, с загадочной улыбкой с чьим-то другим лицом. Представьте, что образ внезапно изменяется электронно. Используя электронный сканер, художник может сейчас включать образы, созданные великими мастерами, в свой компьютер и потом манипулировать этими образами любым образом, каким они хотят – менять цвет, изменять ракурс. Художница Лилиан Шварц иногда включает свое собственное лицо в картину, или она помещает одно изображение поверх другого,

strange. Some of her images are painted directly onto the computer by using a pressure-sensitive screen and stylus. These images are often superimposed on top of scanned images, when she merges her face with the faces of famous women, such as Nefertiti or Amelia Earhart. Would this computer art make Mona Lisa smile?	получая как знакомую, так и странную картину. Некоторые ее изображения нарисованы прямо в компьютере с использованием чувствительного к нажатию монитора и стилуса. Эти рисунки часто накладываются на отсканированные изображения, когда она сливает воедино свое лицо с лицами знаменитых женщин, таких как Нефертити или Амелия Эрхарт. Улыбнулась бы Мона Лиза такому компьютерному искусству?

Перевод заголовка

Перевод заголовка можно выделить в отдельный этап, чтобы подчеркнуть важность и своеобразный характер этой работы.

В художественной литературе заголовок не всегда несет достаточную информацию о содержании произведения. Назначение заголовка в научно-технической литературе совсем другое. Основными чертами заголовков технических статей является особый стиль, выразительная форма. Часто заголовок переводят после чтения или перевода текста с учетом всех особенностей содержания оригинала. И это естественно, так как из переводов заголовков статей, патентов, книг и т. д. составляются библиографические указатели, картотеки, каталоги, справочники, помогающие специалистам отобрать для практического использования материалы совершенно определенного содержания.

Заголовки англо-американских технических статей представляют известные трудности для перевода.

Основными чертами заголовков являются: особый стиль, яркая, броская форма, в которой они преподносятся читателю, и экспрессивность лексических и грамматических средств.

Для заголовков, как правило, характерна предельно сжатая форма изложения. В них могут быть опущены вспомогательные глаголы, глагол-сказуемое, союзы, артикли. В заголовках часто употребляются сокращения и сложносокращенные слова. Тем не

менее, заголовки научно-технических статей, как правило, дают понятие об основном содержании статьи. Например:

Student hackers arrested *– Арестованы учащиеся хакеры.*

В этом заголовке отсутствует глагол-связка.

В современном английском и американском языках можно встретить следующие виды заголовков.

1) Вопрос или косвенный вопрос

How computer viruses work. – Как работают компьютерные вирусы.

Can a robot think? – Может ли робот думать?

2) Употребление в заголовках разговорных форм и сленга, также служит средством привлечения внимания читателя

Why analog is cool again? – Почему аналоговая электроника снова в моде?

3) Особую сложность при переводе представляет использование в заголовках фразеологизмов, игры слов и умышленно измененных устойчивых выражений, смысл которых является понятным лишь для тех, кто хорошо знает реалии и культуру англоязычных стран.

It's an Ad, Ad, Ad, Ad world – Этот рекламный, рекламный, рекламный, рекламный мир. – В заглавии перефразировано название известного фильма. (This is a mad, mad, mad, mad world.)

4) Заголовки могут быть представлены словосочетанием с причастием или герундием.

Talking to computers. – Беседа с компьютерами.

5) Чтобы привлечь внимание в заголовках используются двоеточия, вопросительные и восклицательные знаки.

Microsoft in peril: the nightmare begins – Майкрософт в опасности: кошмар начинается.

6) Восклицательные предложения

It's all on film! – Все можно снять!

XIV. Переведите следующие заголовки статей и аннотационные абзацы к ним. Определите встречающиеся особенности заголовков и трудности их перевода.

1. The Great Robot Race.

Unmanned aerial vehicles are for wimps. 20 driverless bots are about to get down and dirty in the pentagon's million-dollar rumble from LA to Las Vegas. Start your engines.

2. A Machine with a Mind of Its Own.

Ross King wanted a research assistant who would work 24/7 without sleep or food. So he built one.

3. High Score Education.

Games, not school are teaching kids to think.

4. Connecticut Teen Charged with Hacking into Air Force Computer System.

A 15-year old Connecticut youth faces charges of hacking into a government computer system that tracks the positions of US Air Force planes worldwide.

5. Intel Highlights Its Next-Gen Dual-Core Chips.

Intel President Paul Otellini announced three second-generation dual core processors and said first -generation prototypes are faring well.

6. Group Aims to Drastically up Disk Storage.

A few hundred moves on an optical disc? That's the goal of the Holographic Versatile Disc (HVD) Alliance.

7. New Java Looks to Shake up Desktop.

Sun Microsystems gave Java developers new ammo in their outgoing battle against Microsoft with the release of an anticipated Java update.

8. Smell, Taste Coming to the Web.

Elwood Ivey Jr's company, TriSenx, has obtained a patient for technology that uses a desktop like device to produce smells based on data programmed into a Web page.

9. Can't Get Enough TV.

Is TV addiction becoming a Britain's new problem? New figures from the National Office of Statistics suggest that this might be a case.

10. Electronic Invaders.

Computer viruses work the same way as biological viruses. Like a flue bug in a human being a virus spreads on contact and continues replicating itself in the new host.

Supplementary Reading

Текст

Good or Evil?

Increasing numbers of people in the United States and elsewhere in the world are the victims of computer game obsessions or addiction to Internet chat rooms. What's more, the problem is much more serious than the media would have us think. They're inclined to emphasize the positive side of computer games - that they're very entertaining - something almost no one would deny, journalists are right to point out that they can also help people develop skills, such as concentration and problem-solving. Unfortunately, however, for between six to ten per cent of users, games and Internet chat lines become a problem. They spend hours of their time sitting at their computers - in the worst cases users will play games non-stop for whole weekends. Sooner or later this begins to jeopardize their professional and personal lives, and even their physical health. In fact, a person who is unable to control their use of the computer is in a very similar situation to a drug user.

There are two main reasons that people become addicted to computer games and the Internet in this way. The first of these is what specialists term "avoidance": in this case the person is trying to ignore other problems, such as marital strife or financial trouble. Like drug addicts, they try to create a world free from stress, pain and worry. A second reason is fantasy: the person escapes, or gains self-esteem, by adopting online personalities. They can be an airline pilot one minute, and 15 minutes later the director of a company, or a warrior.

It's important to emphasize that being on the computer a lot doesn't make you an addict; just like drinking a lot doesn't necessarily make you an alcoholic. So, what are the warning signs? The number I symptom is a loss of control — an inability to stop yourself using the computer, even when there are negative consequences such as complaints from relatives or friends. Partly as a reaction to this, there's also often a tendency to be dishonest about or to minimize the amount of time spent on the computer

and to be defensive about your right to use it as much as you want. Experiencing a rush of adrenaline when connecting to the Internet or feeling guilty after periods of protracted use are also clear symptoms of addiction, along with signs of irritability when you are interrupted and, of course, dreams about computer games.

Once that point is reached then some kind of help is needed. In some cases the addicted player can break the addiction by stopping abruptly. Others need to be taught to set time limits on computer game sessions until they have got their behavior back under control. In the worst cases, they need to be admitted to a special clinic for a period of treatment.

Текст

Computer Games in Education.

Computer games have come a long way since Pong, a high tech version of table tennis, became the first to hit the screen in 1972. The vast majority of children now regularly play different games. One study has suggested that one teenager in fifteen devotes thirty hours a week to them, though the majority are moderate consumers.

What does it do to young minds?

For years concern has been expressed by parents and teachers about the effect of computer games on the moral and mental make-up of the next generation. Some have warned that a relentless diet of whizz-bang 'shoot-'em-ups' fosters antisocial behavior, even playground violence. Others believe that the age of the zombie is upon us.

But expert opinion is shifting radically. Psychologists in America and Britain now suggest that while computer games hold some dangers for children, they also provide opportunities their parents never enjoyed to amplify powers of concentration and memory. Researchers have also highlighted the positive response of children to the way computer games reward success, thereby spurring them on to look for greater challenges-a boon it the same attitude is applied to school work. A leading academic at the University of Washington has even claimed that children think differently when they play computer games, learning to deal with problems in parallel rather than in sequence. In effect, children are being trained to tackle problems in a fashion which is not only more rapid but also more effective. In the long term, the facility that game players develop with computer graphics could help much in future career. It

could, for example, be of particular benefit to children who go on to become engineers or scientists.

Games are also now being developed for preschool children to encourage reading and writing skills. At Lanterns, a private nursery in east London, computer games make up part of the syllabus. Each week its sixteen pupils- the youngest aged two-are treated to a whirlwind tour of cyberspace. Every day the pupils attend a special class, such as dance or drama, and on Tuesdays they have a computer work shop where they spend an hour playing games. All the children love it. There are no technophobes among them.

Текст

Computer Crime

The headlines tell us about computer crimes after they have been discovered. Hackers are arrested for using telephone and credit card numbers other than their own to acquire goods and money; someone with a distinctly different sense of humor infects software with a vims that causes fish to swim across the spreadsheet. Another someone changes all the scholarship information in the financial aid office, and yet another uses the company computer on company time to do a little freelance writing or software development for an outside client. These are not jokes. These are crimes.

Like most other technological advances, the computer is a tool one that can be used for good or ill. You can save time with computers, write better— or at least write better spelled and better typed - - papers. You can balance budgets, from the personal to the professional: input and store and process and output all kinds of information; and send it around the world as fast as telephone lines and satellites can carry it. You can also use computers frivolously, by typing up notes that would be better handwritten while co-workers mutter in the background. We can use our computers to spy. To lie and cheat. To steal. To do harm.

These last uses arc the uses that concern us in this text. As the power of even the smallest laptop microcomputer in creases, so does the danger of misuse in crease. We have an obligation to use computers responsibly — in ways that are not harmful to the society in which we live and work.

Although pecking at someone's private records may not seem a heinous crime, electronic trespass is a crime. Peckers who gain access to

a co-worker's personnel file or to a neighbor's checking account records are trespassing, just as they would be if they were physically in the bank. They have entered another's computer system or file with out permission - hence, illegally. Among its other provisions, the Computer Fraud and Abuse Act of 1986 makes it a felony to willfully access a computer without, or in excess of, authorization.

The problem of trespassing is compounded when data is altered or destroyed. Although there may sometimes be no intent to alter data and the changes are only the result of striking the wrong key, this is a very rare occurrence. Tn most cases, the trespasser has something to gain from the alterations. The gain may be real as in changing bank records to reflect a higher balance (discuss later), stealing company secrets, erasing long distance charges, or changing that grade from an "F" to an "A". The gain may be strictly personal and vengeful: changing hospital records or credit ratings, destroying social security records, or inserting false and defamatory information in a personnel file. These crimes are serious, and they are costly.

Electronic funds transfers (EFT) take money from one account and move it to another. Banks do this when authorized to do so by legitimate customers. But bank employees have also been known to do it without authorization, directing the funds into their own accounts or those of an accomplice. The transfer of a million dollars will be quickly noted, but the transfer of one — tenth of a cent from every customer's monthly interest will not - - and those fractional cents can quickly add up to many dollars.

Business and industry also have much to lose through electronic trespass. Information about new products, stock transfers, plans to acquire another company - - or to head off such an acquisition — and other proprietary information can be worth millions of dollars to the company or its competitors.

Data encryption - using a code - when transmitting information is one way to help stop would —be electronic thieves. The data encryption standard, a code that was considered unbreakable a dozen years ago, has been broken. It is still in use, how-ever, because the high cost of intercepting the coded data pushes would - be intruders into using less costly and more detectable methods. More recent advances offer codes based on the product of two large prime numbers and on the use of quantum theory7. The latter uses some aspects of the uncertainty

principle to encode messages; both new methods are currently considered unbreakable.

Текст

Robotic Filling Station Will Keep Spy Satellites Aloft

A ROBOT that can refuel and service America's spy satellites while they are in orbit is being developed by Department of Defense researchers. The new system could extend a satellite's life many times over, as it would no longer drop out of orbit and burn up once its fuel was all used.

The robot refueller, dubbed the autonomous space transporter and robotic orbiter (ASTRO), will shuttle back and forth between the spy satellite and fuel dumps stationed in holding orbits, says David Whelan, director of the tactical technology office at the Defense Advanced Research Projects Agency (DARPA).

With today's satellites, it is easy for an enemy to predict the craft's position, unless it changes course. But course changes use up the satellite's limited supply of hydrazine fuel and shorten its life. With a steady supply of fuel available to their satellites, controllers will be able to maneuver them at will, making their orbits more difficult to predict.

The development of ASTRO would revolutionize satellite operators' attitudes. "If an airplane runs out of fuel you don't throw it away," says Charles Miller of Constellation Services International in Dayton, Ohio. And yet, he says, that is precisely what happens with satellites costing as much as $1 billion apiece.

Miller believes a refueling infrastructure is inevitable. His company has been set up to develop a satellite retrieval and repair service along similar lines for commercial telecoms and broadcasting satellites. The DARPA program will rely on future military satellites being fitted with docking stations that allow them to be refueled.

DARPA has secured $5 million to begin designing ASTRO, and expects to commission aerospace contractors to start building prototypes next year. By building satellites with modular electronics systems, the robot could also be used to replace faulty or outdated on-board systems.

Текст

Robotic Helicopter May Offer New Option For Public Safety

NASA and the U.S. Army have developed a remote-controlled helicopter that could be used for a wide range of tasks, including precision crop spraying, border patrol, hazardous spill inspection, fire surveillance, crowd security and emergency medical delivery.

Called the Free Flight Rotorcraft Research Vehicle (FFRRV), the robotic helicopter can carry a movie camera, a still camera, video downlinks, night vision or infrared cameras. Artificial intelligence techniques keep the chopper stable in flight and allow it to be remotely controlled from the ground.

"An autonomous helicopter could help perform all of these jobs better, more quickly, at a lower cost while not exposing any humans to potentially dangerous situations," said Todd Hodges, an Army employee at NASA's Langley Research Center, Hampton, VA, and manager of the helicopter project.

The helicopter contains adaptive electronic flight controf systems that incorporate artificial intelligence techniques, small light-weight sophisticated sensors, and advanced telepresence-telerobotics systems.

According to Hodges, the robotic helicopters also could be used for pollution monitoring, law enforcement, bridge and building construction inspection, crop and forest monitoring, mine clearing and other public security tasks.

"It could even be used as a 'carrier pigeon' shuttling supplies and so forth between military locations," said Hodges. "The potential applications are pretty wide-ranging."

The project initially set out to develop a tool for testing flight dynamics. Hodges and his team were tasked to develop a suitcase-portable version, including a small helicopter and a ground control station comprised of a moving map and video monitor that could be set up in 20 minutes.

The prototype helicopters are powered by a modified gasoline engine and are about six feet long, including the rotor diameter. They can fly at speeds up to 60 mph.

Hodges said inquiries about the technology have come in from various government agencies, the film industry, as well as power and pipeline companies and local fire departments.

Текст

The History of Computer Programming Languages

Liver since the invention of Charles Babbage's difference engine in 1822, computers have required a means of instructing them to perform a specific task. This means is known as a programming language. Computer languages were first composed of a series of steps to wire a particular program; these morphed into a series of steps keyed into the computer and then executed; 1 ater these languages acquired advanced features such as logical branching and object orientation. The computer languages of the last fifty years have come in two stages, the first major languages and the second major languages, which are in use today.

In the beginning, Charles Babbage's difference engine could only be made to execute tasks by changing the gears which executed the calculations. Thus, the earliest form of a computer language was physical motion. Eventually, physical motion was replaced by electrical signals when the US Government built the ENIAC in 1942. It followed many of the same principles of Babbage's engine and hence, could only be "programmed" by presetting switches and rewiring the entire system for each new "program" or calculation. This process proved to be very tedious.

In 1945, John Von Neumann was working at the Institute for Advanced Study. He developed two important concepts that directly affected the path of computer programming languages. The first was known as "shared-program technique" (www.softlord.com). This technique stated that the actual computer hardware should be simple and not need to be hand-wired for each program. Instead, complex instructions should be used to control the simple hardware, allowing it to be reprogrammed much faster.

The second concept was also extremely important to the development of programming languages. Von Neumann called it "conditional control transfer" (www.softlord.com). This idea gave rise to the notion of subroutines, or small blocks of code that could be jumped to in any order, instead of a single set of chronologically ordered steps for the computer to take. The second part of the idea stated that computer code should be able to branch based on logical statements such as IF (expression) THEN, and looped such as with a FOR statement.

"Conditional control transfer" gave rise to the idea of "libraries," which are blocks of code that can be reused over and over.

In 1949, a few years after Von Neumann's work, the language Short Code appeared (www.byte.com). It was the first computer language for electronic devices and it required the programmer to change its statements into O's and I's by hand. Still, it was the first step towards the complex languages of today. In 1951, Grace Hopper wrote the first compiler, A-0 (www.byte.com). A compiler is a program that turns the language's statements into O's and I's for the computer to understand. This lead to faster programming, as the programmer no longer had to do the work by hand.

In 1957, the first of the major languages appeared in the form of FORTRAN. Its name stands for FORmula TRANslating system. The language was designed at IBM for scientific computing. The components were very simple, and provided the programmer with low-level access to the computers innards. Today, this language would be considered restrictive as it only included IF, DO, and GOTO statements, but at the time, these commands were a big step forward. The basic type^of data in use today got their start in FORTRAN, these included logical variables (TRUE or FALSE), and integer, real, and double-precision numbers.

Though FORT AN was good at handling numbers, it was not so good at handling input and output, which mattered most to business computing. Business computing started to take off in 1959, and because of this, COBOL was developed. It was designed from the ground up as the language for businessmen. Its only data types were numbers and strings of text. It also allowed for these to be grouped into arrays and records, so that data could be tracked and organized better. It is interesting to note that a COBOL program is built in a way similar to an essay, with four or five major sections that build into an elegant whole. COBOL statements also have a very English-like grammar, making it quite easy to learn. All of these features were designed to make it easier for the average business to learn and adopt it.

In 1958, John McCarthy of MIT created the LISt Processing (or LISP) language. It was designed for Artificial Intelligence (AI) research. Because it was designed for such a highly specialized field, its syntax has rarely been seen before or since. The most obvious difference between this language and other languages is that the basic and only type of data is the list, denoted by a sequence of items enclosed by

parentheses. LISP programs themselves are written as a set of lists, so that LISP has the unique ability to modify itself, and hence grow on its own. The LISP syntax was known as "Cambridge Polish," as it was very different from standard Boolean logic (Wexelblat, 177) :

x V y - Cambridge Polish, what was used to describe the LISP program

OR(x,y) - parenthesized prefix notation, what was used in the LISP program

x OR y - standard Boolean logic

LISP remains in use today because its highly specialized and abstract nature.

The Algol language was created by a committee for scientific use in 1958. It's major contribution is being the root of the tree that has led to such languages as Pascal, C, C++, and Java. It was also the first language with a formal grammar, known as Backus-Naar Form or BNF (McGraw-Hill Encyclopedia of Science and Technology, 454). Though Algol implemented some novel concepts, such as recursive calling of functions, the next version of the language, Algol 68, became bloated and difficult to use (www.byte.com). This lead to the adoption of smaller and more compact languages, such as Pascal. Pascal was begun in 1968 by Niklaus Wirth. Its development was mainly out of necessity for a good leaching tool. In the beginning, the language designers had no hopes for it to enjoy widespread adoption. Instead, they concentrated on developing good tools for teaching such as a debugger and editing system and support for common early microprocessor machines which were in use in teaching institutions.

Pascal w as d esigned i n a v ery o rderly approach, i t c ombined m any o f the best features of the languages in use at the time, COBOL, FORTRAN, and ALGOL. While doing so, many of the irregularities and oddball statements of these languages were cleaned up, which helped it gain users (Bergin, 100-101). The combination of features, input/output and solid mathematical features, made it a highly successful language. Pascal also improved the "pointer" data type, a very powerful feature of any language that implements it. It also added a CASH statement, that allowed instructions to to branch like a tree in such a manner:

```
CASE    expression    OF
possible-expression-value-1:
statements to execute...
```

possible-expression- value-2:
statements to execute...
END

Pascal also helped the development of dynamic variables, which could be created while a program was being run, through the NEW and DISPOSE commands. However, Pascal did not implement dynamic arrays, or groups of variables, which proved to be needed and led to its downfall (Bergin, 101-102). Wirth later created a successor to Pascal, Modula-2, but by the time it appeared, C was gaining popularity and users at a rapid pace.

C was developed in 1972 by Dennis Ritchie while working at Bell Labs in New Jersey. The transition in usage from the first major languages to the major languages of today occurred with the transition between Pascal and C. Its direct ancestors are B and BCPL*, but its similarities to Pascal are quite ob\ ions. All of the features oi" Pascal, including the new ones such as the CASE statement are available in C. C uses pointers extensively and was built to be fast and powerful at the expense of being hard to read. But because it fixed most of the mistakes Pascal had, it won over former-Pascal users quite rapidly.

Ritchie developed C for the new Unix system being created at the same time. Because of this, C and Unix go hand in hand. Unix gives C such advanced features as dynamic variables, multitasking, interrupt handling, forking, and strong, low-level, input-output. Because of this, C is very commonly used to program operating systems such as Unix, Windows, the MacOS, and Linux.

In the late 1970's and early 1980's, a new programing method was being developed. It was known as Object Oriented Programming, or OOP. Objects are pieces of data that can be packaged and manipulated by the programmer. Bjarne Stroustroup liked this method and developed extensions to C known as "C With Classes." This set of extensions developed into the full-featured language C++, which was released in 1983.

C+H was designed to organize the raw power of C using OOP, but maintain the speed of C and be able to run on many different types of computers. C++ is most often used in simulations, such as games. C++ provides an elegant way to track and manipulate hundreds of instances of people in elevators, or armies filled with different types of soldiers. It is the language of choice in today's AP Computer Science courses.

In the early 1990's, interactive TV was the technology of the future. Sun Microsystems decided that interactive TV needed a special, portable (can run on many types of machines), language. This language eventually became Java. In 1994, the Java project team changed their focus to the web, which was becoming "the cool thing" after interactive TV failed. The next year, Netscape licensed Java for use in their internet browser, Navigator. At this point, Java became the language of the future and several companies announced applications which would be written in Java, none of which came into use.

Though Java has very lofty goals and is a text-book example of a good language, it may be the "language that wasn't". It has serious optimization problems, meaning that programs written in it run very slowly. And Sun has hurt Java's acceptance by engaging in political battles over it with Microsoft. But Java may wind up as the instructional language of tomorrow as it is truly object-oriented and implements advanced techniques such as true portability of code and garbage collection.

Visual Basic is often taught as a first programming language today as it is based on the BASIC language developed in 1964 by John Kemeny and Thomas Kurtz. BASIC is a very limited language and was designed for non-computer science people. Statements are chiefly run sequentially, but program control can change based on IF..THEN, and GOSUB statements which execute a certain block of code and then return to the original point in the program's flow.

Microsoft has extended BASIC in its Visual Basic (VB) product. The heart of VB is the form, or blank window on which you drag and drop components such as menus, pictures, and slider bars. These items are known as "widgets." Widgets have properties (such as its color) and events (such as clicks and doubleclicks) and are central to building any user interface today in any language. VB is most often used today to create quick and simple interfaces to other Microsoft products such as Excel and Access without needing a lot of code, though it is possible to create full applications with it.

Perl has often been described as the "duct tape of the Internet," because it is most often used as the engine for a web interface or in scripts that modify configuration files. It has very strong text matching functions which make it ideal for these tasks. Perl was developed by Larry Wall in 1987 because the Unix sed and awk tools (used for text

manipulation) were no longer strong enough to support his needs. Depending on whom you ask, Perl stands for Practical Extraction and Reporting Language or Pathologically Eclectic Rubbish Lister.

Programming languages have been under development for years and will remain so for many years to come. They got t heir s tart w ith a l ist o f s teps t o w ire a c omputer t o p erform a t ask. T hese s teps eventually found their way into software and began to acquire newer and better features. The first major languages were characterized by the simple fact that they were intended for one purpose and one purpose only, while the languages of today are differentiated by the way they are programmed in, as they can be used for almost any purpose. And perhaps the languages of tomorrow will be more natural with the invention of quantum and biological computers.

Текст

COMMUNICATIONS NETWORKS: CONNECTIVITY

Information and resources gain in value if they can be shared. A network is simply a collection of data communications hardware, computers, communications software, and communications media connected in a meaningful group to allow users to share information and equipment. The three most common types of networks are private, public, and international.

A private network i s specifically designed to support the communications needs o f a particular b usiness o rganization. M any o rganizations w ith g eographically s eparated facilities and a need for a large volume of data and voice communications implement or install their own private communications networks. The Southern Pacific Railroad was one of the first organizations to develop its own comprehensive microwave communications network to facilitate communication along all its railways. Its microwave towers can be seen along any of the major rail lines.

A public network, in contrast, is a comprehensive communications facility designed to provide subscribers (users who pay a fee) with voice and/or data communications over a large geographical area (in some cases coast to coast). Public networks such as Bell Telephone and AT&T Communications are sometimes referred to as common carriers. Some public communications networks offer teleconferencing services - -

electronically linking several people by phone, computer, and video (Figure 1).

The term international network is used to describe a communications network specifically designed to provide users with intercontinental voice and data communications facilities. The majority of these networks use undersea cable or satellite communications. Western Union and RCA provide international networks.

Текст

NETWORK CONFIGURATIONS

A number of different network configurations, or shapes, are used to satisfy the needs of users in different situations. The basic types of configurations are star (and hierarchical) network, bus network, and ring (and token ring) network. Although each network configuration i s actively u sed today by private, public, and international communications networks, you will most likely come into contact with one in the context of a local area network.

A local area network (LAN) is a private communications network, connected by a length of wire, cable, or optical fiber, and run by special networking software that serves a company or part of a company that is located on one floor or in a single building (Figure 2). A LAN is similar to a telephone system in that any telephone connected to the system can send and receive data. The LAN is generally owned by the company that is using it. It is estimated hat, by 1993, more than 20 million PCs in North America will be attached to LANs. Chances are that the microcomputer you will be using in your office will be part of a local area network. LANs allow office workers to share hardware (such as a laser printer or storage hardware), to share software and data, and to essentially make incompatible units compatible. The LAN also provides a communications link to outside communications systems, and it can be connected to other local area networks in different locations, either by public communications l ines o r by leased d edicated lines. Note that modems are not always needed within a local area network; special hardware and software are used instead.

Текст

STAR NETWORK

The star network, a popular network configuration, involves a central unit that has a number of terminals tied into it. These terminals are often referred to as nodes. Both point-to-point and multidrop lines are used to connect nodes to the central computer. This type of network configuration is well suited to companies with one large data processing facility shared by a number of smaller departments, and it is often used by airline reservation systems. The central unit in the star network acts as the traffic controller between all the nodes in the system. The central unit is usually a host computer or a file server. The host computer is a large computer, usually a mainframe. A file server is usually a microcomputer with a large-capacity hard disk storage device that stores shared data and programs.

The primary advantage of the star network is that several users can use the central unit at the same time - - the star is sometimes used to link microcomputers to a central database. However, its main limitation is that the whole network is affected if the main unit "goes down" (fails to function). Since the nodes in the system are not designed to communicate directly with one another, all communication stops. Also, the cost of cabling the central system and the points of the star together can be very high.

Hierarchical n etwork. This type of network c onfiguration is b asically a star n etwork with smaller star networks attached to some of the nodes.

When a number of star networks are configured into a single multilevel system, the resulting network is often referred to as a hierarchical, or tree, network. In this type of network a single host computer still controls all network activity. However, each (or some) of the computers connected into the main computer in the first level of the star has a star network of devices connected to it in turn.

Hierarchical network configuration is often used by large companies with a main communications center linked to regional processing centers. Each regional processing facility acts as a host computer to smaller offices or branch computer facilities within the region. The lowest-level computer facilities allow the users to do some stand-alone applications processing. The regional computer facilities are used to

manage large business information resources (usually in the form of regional databases) and to provide processing support that the smaller computers cannot handle efficiently.

Текст

Bus NETWORK

In a bus network, a number of computers are connected by a single length of wire, cable, or optical fiber. All communications travel along this cable, which is called a bus. There is no host computer or file server. The bus network is often used to hook up a small group of microcomputers that share data. The microcomputers are programmed to "check" the communications that travel along the bus to see if they are the intended recipients. The bus network is not as expensive as the star network, and, if one of the microcomputers fails, it does not affect the entire network. However, the bus network is not as efficient as the star network.

RING NETWORK A ring network is much like a bus network, except the length of wire, cable, or optical fiber connects to form a loop; each device is connected to two other devices. This type of configuration does not require a central computer to control activity nor does it use a file server. Each computer connected to the network can communicate directly with the other computers in the network by using the common communications channel, and each computer does its own independent, applications processing. When one computer needs data from another computer, the data is passed along the ring. The ring network is not as susceptible to breakdown as the star network, because when one computer in the ring fails, it does not necessarily affect the processing or communications capabilities of the other computers in the ring. The ring configuration is not used as frequently as the other configurations; however, it is often used to link mainframes over wide distances.

VOCABULARY

Unit 1

application (n)	заявление, применение
araficial intelligence	искусственный интеллект
avaibility (n)	доступность
computation (n)	вычисление
connect (v)	связывать
data (n)	данные
deliver (v)	доставлять
dependability (n)	надёжность
design (v)	предназначать, конструировать
hardware	аппаратура, аппаратное оборудование
incompass (v)	окружать
input (n)	вход, подвод
output (n)	продукция, выпуск
overlap (v)	частично покрывать
predict (v)	предсказывать
provide (v)	обеспечивать
software	программное обеспечение
support (n, v)	поддержка, поддерживать
voice (n)	голос

Unit 2

accrue (v)	увеличиваться
assurance (n)	уверенность
authorize (v)	уполномочивать
commensurate (adj)	соответственный
converse (adj)	перевёрнутый, обратный
define (v)	определять
denial (n)	отрицание
eradicate (v)	искоренять

guise (n)	облик
perfectible (adj)	способный к совершенствованию
proper (adj)	надлежащий
protect (n)	защищать
safeguard (n)	предосторожность
security (n)	безопастность
storage (n)	хранение

Unit 3

attempt (n, v)	попытка, пытаться, пробовать
befit (v)	подходить
benefit (n)	выгода
bind (v)	связывать
implement (n, v)	орудие, выполнять
improvement (n)	улучшение
inapropriate (adj)	неподходящий
link (n, v)	звено, соединять
stock-out (n)	израсходование запасов

Unit 4

appropriately (adv)	соответственно, присуще
argue (v)	доказывать, спорить
brain (n)	мозг
capacity (n)	объем
challenge (n)	вызов
circuitry (n)	кругооборот
conceivably (adv)	предположительно
consciousness (n)	сознание
controvercial (adj)	спорный, дискуссионный
cue (n)	реплика, намек
define (v)	определять
envision (v)	рассматривать
encounter (v)	сталкиваться, наталкиваться
execution (n)	исполнение, выполнение
hypothesize (v)	строить гипотезу

inflection (n)	интонация
incomprehensible (adj)	непонятный, непостижимый
interact (v)	взаимодействовать
obstacle (n)	препятствие
realm (n)	область, сфера
recreation (n)	воссоздание, создание заново
replicate (v)	повторять, копировать
signify (v)	значить, иметь значение
sturdy (adj)	стойкий, твердый
ultimate (adj)	элементарный, основной

Unit 5

advanced (adj)	передовой, продвинутый
appendage (n)	придаток, привесок
approach (n)	подход
bumper (n)	буфер, амортизатор
constrained (adj)	вынужденный, стесненный
depth (n)	глубина
elaborate (adj)	тщательно разработанный, сложный
exploratory (adj)	исследующий, исследовательский
impact (n)	удар, толчок, столкновение
perceptive (adj)	восприимчивый
random (adj)	случайный, сделанный наугад
rough (adj)	неровный, пересеченный
smart (adj)	быстрый, ловкий
smell (n)	обоняние, запах
stimulus (stimuli) (n)	влияние, стимул
terrain (n)	местность
zip (v)	быть энергичным, промелькнуть

Unit 6

abdomen (n)	брюшная полость
bypass (n)	шунт

gallbladder (n)	желчный пузырь
heartburn (n)	изжога
incision (n)	разрез, надрез
invasive (adj)	агрессивный
remote (adj)	дистанционный
site (n)	участок
surgeon (n)	хирург
suture (v)	накладывать шов, зашивать
sync (adv)	синхронно
tissue (n)	ткань
trial (n)	опыт, испытание
unprecedented (adj)	беспрецедентный

Unit 7

abnormality (n)	ненормальность, аномалия
accomplish (v)	совершать, выполнять
chest (n)	грудь, грудина
currently (adv)	общее, распространенное мнение
eliminate (v)	устранять, исключать
enhance (v)	увеличивать, повышать
eventually (adv)	в конце концов, со временем
fatigue (n)	усталость, утомление
pain (n)	боль
steady (adj)	твердый

Unit 8

amphibious (adj)	десантный
assault (adj)	штурмовой
assault robot (n)	штурмовой робот
berserk (adj)	неистовый
boot (v)	заряжать, загружать
deactivate (v)	обезвреживать
explosive (n)	взрывчатое вещество
go berserk	приходить в бешенство
hostile (adj)	вражеский

law enforcement agencies	правоохранительные органы
mode (n)	режим
mount (v)	устанавливать, монтировать
negotiate (v)	преодолевать
obstacle (n)	препятствие
rubble (n)	булыжник
surroundings	среда, окружение
surveillance (n) [sɜ:ˈveɪl(ə)ns]	наблюдение, надзор
tread (n)	колея, ширина хода

Unit 9

blend (v)	смешивать, соединять
concurrently (adv)	одновременно, согласованно
curvature (n)	кривизна
emphasize (v)	подчеркивать
extrusion (n)	выдавливание, экструзия
hub (n)	втулка
injection molding (n)	литье под давлением
macro (n)	макропрограмма
merge (v)	сливать (ся), соединять
modeler (n)	моделирующее устройство
protrusion (n)	выступ
shaft (n)	вал
shortcut (n)	комбинация клавиш для быстрого вызова
sketcher (n)	программное средство генерации изображений
solid modeler	устройство моделирования объемных деталей
surfacing (n)	выравнивание поверхности
sweep (v)	вычерчивать
tangential (adj)	направленный по касательной к кривой

Unit 10

capture (v)	захватывать

clay (n)	глина
deliver (v)	доставлять, подавать
engage (v)	занимать, привлекать
exert (v)	оказывать, прилагать
haptic (adj)	относящийся к осязанию
haptic devices	гаптические устройства
insert (v)	вставлять, вводить
palpate (v)	прощупывать
pattern (n)	образец, модель, шаблон
penetrate (v)	проникать, понимать
point at (v)	указывать на
probe (n)	щуп, контактный датчик
sensation (n)	ощущение
sense (n) (v)	чувство, чувствовать, осознавать
sight (n)	зрение, взгляд
stylus (n)	стилус
tactile (adj)	осязательный
texture (n)	строение, текстура
thimble (n)	наконечник
touch (n,v)	прикосновение, осязание; трогать; прикасаться
trainee (n)	стажер

Acronyms and Abbreviations

ACK (positive 'Acknowledgement')	знак подтверждения приема данных; квитанция
ADC (Analogue to Digital Converter)	преобразование из аналоговой формы в цифровую; аналого-цифровой преобразователь
AI (Artificial Intelligence)	искусственный интеллект
ALGOL (ALGOrythmic Language)	АЛГОЛ, алгоритмический язык программирования
ALU (Arithmetical Logical Unit)	арифметико-логическое устройство, АЛУ
ASCII (American Standard Code for Information Interchange)	стандартный американский код для обмена информацией
Bit (binary digit)	двоичная цифра, двоичный разряд; двоичный знак
Bps (bits per second)	(число) бит в секунду, бит/с
CAD (Computer-Aided Design)	автоматическое проектирование
CAM (Computer-Aided Manufacturing)	изготовление (производство) с использованием вычислительных машин, автоматизированное производство
COM (Computer Output Microfilm)	машинный микрофильм
Cps (1. characters per second)	1. (число) знаков в секунду (единица скорости работы печатающего устройства или скорости передачи данных);
(2. cycles per second)	2. период в секунду, Гц
CPU (Central Processing Unit)	центральный процессор, ЦП
CR (Carriage Return)	обратный ход каретки, возврат каретки
CRT (Cathode Ray Tube)	электроннолучевая трубка, ЭЛТ

CU (Control Unit)	устройство управления, блок управления
DAC (Digital to Analogue Converter)	цифро-аналоговое преобразование
DBMS (DataBase Management System)	система управления базой данных
DOS (Disk Operating System)	дисковая операционная система, ДОС
EAROM (Electrically Alterable Read Only Memory)	электрически перепрограммируемая постоянная память, запоминающее устройство, ЭППЗУ
GHz (Gigahertz)	гигагерц, Ггц
I/O (Input/ Output)	1. ввод-вывод; 2. устройство ввода-вывода; 3. данные ввода-вывода
IT (Information Technology)	информационная технология, техника обработки информации
k (kilo)	кило, К (единица ёмкости ЗУ)
KB (kilobyte)	Килобайт
LCD (Liqiud Crystal Display)	жидко-кристаллический индикатор; жидко-кристаллическое табло
LP (Linear Programming)	линейное программирование
MB (megabyte)	Мегабайт
MBPS (Megabytes per second)	мегабайт в секунду, миллион бит в секунду
MIPS (Million Instructions per second)	миллион (одноадресных) операций в секунду
Modem	модулятор-демодулятор, модем
MTBF (Mean Time between Failure)	средняя наработка на отказ, среднее время безотказной работы
NAK (Negative Acknowledgement)	отсутствие подтверждения приема
OCR (Optical Character Recognition)	оптическое распознавание знаков

OS (Operating System)	операционная система
PC (Personal Computer)	персональная вычислительная машина
PERT (Project Evaluation and Review Technique)	(система) ПЕРТ (система планирования и руководства разработками)
PROM (Programmable Read-Only Memory)	программируемая постоянная память, программируемое постоянное запоминающее устройство
RAM (Random Access Memory)	память (ЗУ) с произвольной выборкой
ROM (Read Only Memory)	постоянная память, постоянное ЗУ
TELEX (Teletypewriter EXchange)	телекс
TFT (Thin Film Transistor)	(тонко) пленочный транзистор
VDU (Tramiel Operating System)	устройство визуального отображения, дисплей
WP (Word Processor)	текстовый процессор

Contents

Учебное издание

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ЛАПИЦКАЯ Татьяна Николаевна
ЛЮБАВИНА Людмила Александровна

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для студентов II курса факультета
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