МІНІСТЕРСТВО ОСВІТИ І НАУКИ УКРАЇНИ
НАЦІОНАЛЬНИЙ АВІАЦІЙНИЙ УНІВЕРСИТЕТ
Навчально-науковий Гуманітарний інститут
Кафедра англійської філології і перекладу

МАТЕРІАЛИ ДО ПРАКТИЧНИХ ЗАНЯТЬ

з дисципліни «Практика перекладу галузевої літератури»
за напрямом підготовки 6.020303 «Філологія»

Укладач:
канд. філол.н. Галій Л.Г.

Матеріали до практичних занять
розглянуті та схвалені на засіданні
кафедри англійської філології і перекладу
Протокол № ____ від «___»_____2016 р.
Завідувач кафедри _____ Сидоренко С.І.

Module 1
Translation of inverted predicate

1. Translation of inverted predicate using sense inversion.
2. Translation of inverted predicate using analytical form of the verb predicate
3. Translation of inverted predicate using notional form of the verb-predicate.

Recommended literature

1. Карабан В.І., Мейс Дж. Переклад з української мови на англійську мову : [навчальн. пос.-довідник для студентів вищих навч. закладів] / В. І. Карабан, Дж. Мейс. – Вінниця : Нова книга, 2003. – 608 с.

2. Максімов С. Є. Практичний курс перекладу (англійська та українська мови). Теорія та практика перекладацького аналізу тексту : [навч. пос.]. – К. : Ленвіт, 2012. – 203 с.

1. Translation of inverted predicate using sense inversion.

Translation of subordinate concession clauses using sense inversion of the complex nominal predicate (*переклад підрядних речень поступки із застосуванням інверсії смислової частини складного іменного присудка*)

These concession clauses are started by the help of conjunction "хоча" and word combination "як(им) ... не":

Хоча це може видатися дивним, цьому певну увагу приділило Міністерство оборони. **– Odd as it may seem,** some attention has been given to this by the Defense Ministry.

Прояви жорстокості закладені в природі людини, **хоча дуже неприємно з цим погоджуватися.** – Cruelty is inherent in human nature, **unpleasant as it may be to accept this.**

Організації тісного співробітництва між народами та державами сприяв, **як це не парадоксально,** другий прихід радянської номенклатури. – The organization of close cooperation among the peoples and states has been facilitated, **paradoxical** as **it may be,** by the second advent of the Soviet nomenklatura.

Як не банально це звучить, Німеччина дуже боїться фашизму, а з ним – і інфляції. **– Trite as it may sound,** Germany has a strong fear of fascism, and with it inflation.

Subordinate clause **"як би, там не було"** is translated like **"be that as it may"**:

Як би там не було, у найближчому майбутньому можна очікувати цілу низку судових позовів – з одного боку, між власниками-комуністами і новими власниками, а з другого боку – між самими комуністичними партіями. – **Be that as it may,** a whole series of law suits – both between communist and new proprietors, on the one hand, and among the communist parties themselves, on the other – may be expected in the immediate future.

Як би там не було, обидва судові процеси показують, що існує суттєва різниця не тільки юридичного характеру. – **Be that as it may**, but both trials have shown considerable differences not only of a legal nature.

Inversion of the nominal part of a complex nominal predicate (*інверсія іменної частини складного іменного присудка*)

Such type of inversion is used for sentence patterns such as "Настільки/більш важливим є ..." and for that starting with "особливо + Прикметник"; "*Серед* + Іменна група"; "Ось...":

- "Настільки/більш важливим є ..." / "особливо + Прикметник"

Значно більше політичне значення має ідея про те, щоб міністр був підзвітний Палаті громад за проведення політики міністерства. – **Of much more political significance** is the idea that a minister is responsible to the House of Commons, for the conduct of departmental policy.

Навіть **ще важливішою** є логіка принципів. – Even **more important is** the logic of principles.

Виключне становище серед колишніх радянських республік мали три маленькі прибалтійські країни. **– Exceptional among the former всіх Soviet states were** the three small Baltic countries,

Особливо сподобається студентам у книзі широкий набір навчальних засобів. – **Of particular appeal** to students – will be the book's range of learning aids.

Тут йдеться про такі фундаментальні питання, як кордони Ірландії і Об'єднаного королівства, національна ідентичність і легітимність британського правління. – **At issues are** such fundamental questions as the borders of Ireland and the United Kingdom, national identity and the legitimacy of the British rule.

- "*Серед* + Іменна група"

Серед них – дослідження В. Полохало та О. Дергачова в галузі політичних партій, поведінки виборців та груп тиску, С. Павленка в галузі лобістських груп та В. Геслі про вибори в Україні. – **Among these are** the studies of V. Polokhalo and O. Derhachov in the field of political parties, voter behaviour, and pressure groups, S. Pavlenko on interest groups, and V. Hesley on Ukrainian elections.

Серед гостей фестивалю – чоловічий балет Михайловського та блискучий литовський актор Масальскіс. – **Among the guests of the festival are** Mikhailovsky's male ballet and brilliant Lithuanian actor Masalskis.

Серед таких поселень був і Київ, розташований на високому правому березі ріки Дніпро. – **Among such early settlements** was **Kyiv** on the high right bank of the Dnipro River.

- "Ось..."

Ось деякі додаткові факти, вибрані з мого дослідження. – **Here are** some additional facts culled from my research.

Ось вам нафтогін, ним потече нафта, і ви отримаєте гроші. – **Here is** a pipeline for you, oil will flow through it, and you will receive money.

2. **Applying the inversion of the analytical form of the verb-predicate** *(застосування інверсії частини аналітичної форми дієслова-присудка)*

To discharge a large group of the subject and to ensure coherence with the previous sentence you can use inversion of the main or subordinate *(службова)* part of the analytical form of the verb-predicate:

Ось типова розмова із західним високопосадовцем. **– Here is** a typical conversation with a high-placed Western official.

В Україні зараз **створюється** театральна антологія "Обличчя XX сторіччя". – Currently **being compiled** in Ukraine **is** a theater anthology, "The Face of the 20th Century."

На сидінні автомобіля **лежав** маршрут, який свідчив про те, що водій їхав зі Львова до Києва. **– Lying** on the car seat **was** an itinerary showing that the driver was traveling from Lviv to Kyiv.

Рухає всім цим ідея покласти Інтернет вам на долоню. – **Driving** all this is the idea of putting the Internet on the palm of your hand.

Inversion of the subordinate part of the analytical form of the verb-predicate in English sentence is used to translate Ukrainian sentences that start with words *лише* or *ніколи*:

Лише у 1989 році засідання Палати громад **транслювалися** по телебаченню. – Only in 1989 were proceedings in the House of Commons **televised**.

Лише починаючи з 1970-х років більшість українців **живе** у містах. –Only since the 1970s **have** a majority of Ukrainians **been** city dwellers.

Лише тоді **видається** документ на дозвіл продажу цього виробу в Україні. – Only then is a document **issued** allowing the sale of this product in Ukraine.

Ніколи ще за минулі 23 року у світі так гостро не **відчувалася** потреба в реальній владі, спроможній вирішувати глобальні проблеми і справлятися з міжнародними кризами. – Never before in the past 23 years **has the world felt** such a strong need for a real power capable of resolving global problems and handling international crises.

Ніколи раніше вибір місця проведення Олімпіади не **привертав** такої уваги у світі, як зараз. – Never before **has** the choice of the Olympic host-city **evoked** such a worldwide interest as now.

3. Applying the inversion of the notional verb-predicate *(застосування інверсії повнозначного дієслова-присудка)*

Inversion of the predicate in English sentences is used in translation of Ukrainian sentences that often have a large group of subject and where the circumstance takes the first position *(обставина)*:

Для того, щоб збільшилися надходження інвестицій, споживання повинно зменшитися. **У цьому полягає** політична дилема. Проте **у цьому** також **полягає** й реальна можливість для політичного керівництва. – In order for investment to go up, consumption must come down. **Herein lies** the political dilemma. But **herein also lies** the opportunity for political leadership.

У північно-тихоокеанському регіоні відбувається одна із значних геостратегічних подій наших часів. – **In the North Pacific region is happening** one of the great geostrategic events of our times.

Таким чином утворилася потреба у величезній військовій машині. –**Thus** was created the need for a huge military machine.

На центральному місці по руч із ним сидів Микола – молодий чоловік, який одним із останніх увійшов до космічного корабля. – **In the center seat next to him sat** Mykola – a young man, one of the last to enter the spaceship.

Predicate inversion in translation also occurs when a Ukrainian sentence predicate is expressed by the verb of speaking or message:

Ймовірність того, що теперішній парламент буде достроково розпущений, зараз висока, як ніколи, **кажуть офіційні особи у парламенті. –** The chances that the current Parliament will be dissolved early are as high as ever, **say officials** in the Parliament.

У будь-якому випадку, **відзначив представник** британського прем'єра, перегляд боргів не починатиметься раніше 2004 року. – At any rate, **noted a representative** of the British premier, the revision of the debts will not begin any sooner than in the year 2004.

Agriculture

Text A

Fill in the gaps according to the context and translate the texts

Each year, many Kenyans _____ from a college or university. Yet many graduates are unable find a job in the country after finishing their studies. The reason: large numbers of young Kenyans are already _____.

Now, some university graduates are _____ agriculture as a way to fight unemployment. They think that farming can be as _____ as any other business or job.

Thirty-three-year old Caleb Karuga is the _____ and _____ of Wendy Farms. He grows vegetables, and keeps farm animals, including _____ cows and _____.

Three years ago, he began training for an agricultural business, or _____. He signed a _____ to use land owned by other people. He now has four pieces of _____.

Caleb Karuga says many young people are going into agribusiness. He says the business does not require a lot of money to start.

"Many are times people think you need a lot of money to get into agribusiness; with 100 dollars you're good to lease some land, really in Kenya. In any part of the country, one acre you are good to go."

Increasing numbers of young people are turning to farming, and the industry is growing.

Diana Kuya is studying _____ at the University of Nairobi. She has _____ some land that is _____ for lease. She plans to launch an agribusiness once she is done with her studies.

"Knowledge is important but it's not everything you know. You have to be wise, you want to wait for that white collar job so that you start getting your own money so that you become independent and all that stuff. And an amazing thing about agriculture is that you can start it at whatever age."

Jacob Natu, an economist at Kenyatta University, agrees. He says this is one reason why the Kenyan government is adding billions of dollars into the _____. He says it wants to push agriculture from _____ farming to business.

"People are _____ seeing agriculture as a way for those who cannot make it, but instead it's becoming a sector which can attract each and every one of us. So it can solve the very big unemployment problem that we are _____ facing."

Agricultural experts say there has been a change in thinking about farming. They say many Kenyans now understand that the agricultural sector can be _____ if done right. They also say people new to farming, like Diana Kuya, will need advisors to _____ them.

Text B

Fill in the gaps according to the context and translate the texts

Now that the United States and Cuba have _____ relations, American farmers are exploring ways to sell their _____ to the island nation.

Wendell Shauman operates a farm in the U.S. state of _____. Corn and _____ from his farm soon may be sold in Cuba.

Mr. Shauman spoke to VOA as he moved some of his corn crop from a ____ _____ building to a truck. The Illinois farmer hopes more of his crops will be going to Cuba. He says the re-establishment of relations is good for American agriculture. He says American farmers should be successful in Cuba because the island is close to the United States, making _____ _____ low. He also says U.S. farmers are producing the crops Cubans need.

Cuba now imports about _____ percent of its food, paying about _____ a year. Some of that food comes from the United States. American farmers have been selling crops to Cuba since 2000, when _____ _____ were ___. Last year, they sold about _____ tons of chicken to Cuba.

But the U.S. _____ of the Cuban market has _____ recently because of increased _____ from other countries. In those areas, farmers are not legally barred from _____ credit to Cuba.

That is why Wendell Shaumann wants the U.S. to _____ its ___ on trade with Cuba, and soon. He says U.S. farmers are _____ competition in Cuba from _____ countries, _____ and even _____. He says it _____ _____ to sell crops in a market that is so close to the United States.

But not everyone wants to increase trade with Cuba. Roger Noriega is a former U.S. _____ to the Organization of American States. He says the possible economic _____ from freer trade with Cuba are not as great as some believe. Mr. Noriega says companies want to do business with trustworthy people. In his words, “you can’t trust a dictatorship.”

Much of the corn and soybeans that Mr. Shauman grows are taken by _____ to a _____ _____ center next to the Mississippi River. The crops are then placed on river _____, which bring the crops to _____, _____. From there, they are shipped around the world.

Gary LaGrange is the president of the Port of New Orleans. He says an end to the trade ban with Cuba would increase business at the port and create more jobs there, especially in transportation. He says there would be an increase in the number of ships sailing between Cuba and New Orleans.

Mr. LaGrange says there has already been an increase in business at the port because of a law signed in 2000. It is called the *Trade Sanction Reform and Export Enhancement Act*. The measure permitted sales of some agricultural products, medicines and medical devices in Cuba.

Mr. LaGrange notes that as a result of that law, the port has been _____ goods to Cuba. He believes the _____ of the trade sanctions will result in an increase in business of 10 to 15 percent. He says exports from the U.S. to Cuba will increase, but so will imports to the U.S. from Cuba. He adds that before the sanctions were put in place, Cuba's largest _____ partner was the port of New Orleans.

Mr. Noriega, the former OAS ambassador, says he opposes the end of the _____ on Cuba for both moral and economic reasons. He says he does not believe the United States should trade with Cuba because the island continues operating under a communist dictatorship. He says the Cuban government will use _____ from trade to continue to _____ its people. He says that is not something Western nations should support.

But farmer Wendell Shauman says old Cold War _____ between the East and West have ended. He says U.S. farmers just want to sell their crops to Cuba. He says farmers should let political leaders worry about the politics.

Agriculture experts say an end to the sanctions could increase U.S. exports to Cuba by as much as 200 percent within the next four years.

Biology

Translate the text using the topical vocabulary

Найдавніша система біологічної класифікації була розроблена давньогрецьким філософом Аристотелем, який класифікував тварин, базуючись на способі їхнього пересування (землею, водою чи повітрям).

Сучасна класифікація побудована на засадах, запропонованих Карлом Ліннеєм, який перший згрупував види живих істот на основі спільних анатомічних характеристик. Пізніше ця класифікація було скорегована з огляду на філогенетику (науку, що засновується на теорії еволюції Чарльза Дарвіна), з метою відображення еволюційних зв'язків між організмами.

В останній час набула значного поширення так звана *молекулярна систематика*, побудована на аналізі генетичного матеріалу (ДНК або РНК). Ця система класифікації виявила численні еволюційні зв'язки між організмами, які до того не були відомі. Таким чином, завдяки впровадженню молекулярної систематики, існуюча класифікація живих істот вже багато в чому скорегована і буде корегуватись в майбутньому. Одним з прикладів груп, що використовують цей підхід, є APG — міжнародний колектив ботаніків-систематиків.

Computer science

Translate the texts

Text A

Latest Technology Inventions

Analysts predict that the latest technology inventions in cloud computing will significantly influence how we use our computers and mobile devices.

Cloud computing is where tasks and file storage on your computer are performed and stored elsewhere.

By using an internet connection you can connect to a service that has the architecture, infrastructure and software to manage any task or storage requirement at less cost.

The advantages of cloud computing is that it eliminates the difficulty and expense of maintaining, upgrading and scaling your own computer hardware and software while increasing efficiency, speed and resources.

Your computer's processing speed, memory capacity, software applications and maintenance requirements are minimized.

You could store and access any size or type of file, play games, use or develop applications, render videos, word process, make scientific calculations, or anything you want, by simply using a smart phone.

As a comparison, let's say you had to generate your own electricity. You would need to maintain, upgrade and scale these resources as required to meet your demands. This would be expensive and time consuming.

Cloud computing could be compared to how a utility provides electricity. It has the architecture, infrastructure, applications, expertise and resources to generate this service for you. You just connect to their grid.

Microsoft, IBM and Google are some of the companies that are investing heavily into the research and development of cloud technology.

Text B

This digital pen is a computer invention that transmits writing into digital media.

Although touch screen devices represent a movement away from paper, approximately eighty-percent of businesses still use paper based forms.

Many professions hand-write their notes, tables, diagrams and drawings instead of using tablets or other devices.

The computer pen is comparable to a regular ink pen (even uses refillable ink) that writes on regular paper, except it has an optical reader that records motion, images and coordinates. The recorded data is then transmitted to a computer via a wireless transmitter.

You can browse and edit your written notes, diagrams, tables, or drawings.

Another useful feature of this computer invention is that hand-written digital files can be easily converted into text fonts for use in word documents or emails.

Digital pen technology was first developed by the Swedish inventor and entrepreneur Christer Fåhraues.

Fåhraues is a physician and has an honorary doctorate degree in technology from Lund University in Sweden, and a M.Sc. degree in Bioengineering from the University of California San Diego.

Fåhraues served as the Chief Executive Officer and Chairman of Anoto Group AB, a company he originally founded in 1996 as C Technologies to license his digital pen technology.

This computer invention has been licensed to companies around the world for various commercial products. Applications include data/signature capture, completing forms, mapping, surveying, document management, paper replay, whiteboards, toys and education.

There are great expectations for digital pen technology over the next few years.

Text C

Academics from the University of Bristol will present new breakthroughs on two fundamental problems in Computer Science. These results will be presented at the world's leading international conference in computer science this week.

The 56th annual IEEE symposium on Foundations of Computer Science (FOCS 2015) will take place in California from Oct. 18-20 .

One of the most challenging questions in computer science is whether there exist problems that are provably hard to solve. This is most famously shown in an unsolved computer science question of whether P=NP, for which anyone who solves the problem would be awarded a prize of $1,000,000.

In the first paper, New unconditional hardness results for dynamic and online problems, Dr Raphaël Clifford, Reader in Algorithm Design in the University's Department of Computer Science and colleagues from Aarhus University, have proved hardness results for versions of matrix vector multiplication, a fundamental tool in much of applied mathematics. The researchers go on to show further hardness results for problems where the data are dynamically changing.

The research team have studied the cell probe complexity of two fundamental problems: matrix-vector multiplication and a version of dynamic set disjointness known as Patrascu's Multiphase Problem. The researchers have presented improved unconditional lower bounds for

these problems as well as introducing new proof techniques of independent interest. These include a technique capable of proving strong threshold lower bounds of the following form: If we insist on having a very fast query time, then the update time has to be slow enough to compute a lookup table with the answer to every possible query. This is the first time a lower bound of this type has been proven.

The lower bounds the researchers have proved equal the highest that have ever been achieved and give the second ever example of such a mathematical proof that holds even when a potential solution is allowed to use random numbers.

In the second paper, Constructing linear-sized spectral sparsification in almost-linear time, Dr He Sun, Lecturer in Computer Science in the University's Department of Computer Science and Yin Tat Lee, a PhD student from MIT, have presented the first algorithm for constructing linear-sized spectral sparsifiers that runs in almost-linear time.

More and more applications from today's big data scenario need to deal with graphs of millions of vertices. While traditional algorithms can be applied directly in these massive graphs, these algorithms are usually too slow to be practical when the graph contains millions of vertices. Also, storing these practical massive graphs are very expensive.

Dr He Sun said: "Over the past decade, there have been intensive studies in order to overcome these two bottlenecks. One notable approach is through the intermediate step called spectral sparsification, which is the approximation of any input graph by a very sparse graph that inherits many properties of the input graph. Since most algorithms run faster in sparse graphs, spectral sparsification is used as a key intermediate step in speeding up the runtime of many practical graph algorithms, including finding approximate maximum flows in an undirected graph, and approximately solving linear systems, among many others."

Using spectral sparsification, the researchers ran many algorithms in a sparse graph, and obtained approximately the correct results as well. This general framework allowed them to speed up the runtime of a wide range of algorithms by a magnitude. However, to make the overall approach practical, a key issue was to find faster constructions of spectral sparsification with fewer edges in the resulting sparsifiers. There have been many studies looking at this area in the past decade.

The researchers have proved that, for any graph, they can construct in almost-linear time its spectral sparsifier, and in the output sparsifier every vertex has only constant number of vertices. This result is almost optimal respect to time complexity of the algorithm, and the number of edges in the spectral sparsifier.

Paper: New unconditional hardness results for dynamic and online problems by Raphael Clifford, Allan Grønlund, Kasper Green Larsen presented at the symposium on Foundations of Computer Science (FOCS 2015).

Paper: Constructing linear-sized spectral sparsification in almost-linear time by Yin Tat Lee, He Sun presented at the symposium on Foundations of Computer Science (FOCS 2015). Their paper has been invited to the special issue of SIAM Journal on Computing, which is dedicated to the best papers of the conference.

Text D

Scientists developed a new revolutionary system to help individuals with disabilities to control wheelchairs, **computers** and other devices simply by using their tongue.

Engineers at the Georgia Institute of Technology say that a new **technology** called **Tongue Drive system** will be helpful to individuals with serious disabilities, such as those with severe spinal cord injuries and will allow them to lead more active and independent lives.

Individuals using a tongue-based system should only be able to move their tongue, which is especially important if a person has paralyzed limbs. A tiny magnet, only a size of a grain of rice, is attached to an individual's tongue using implantation, piercing or adhesive. This technology allows a disabled person to **use tongue when moving a computer mouse or a powered wheelchair**.

Scientists chose the tongue to control the system because unlike the feet and the hands, which are connected by brain through spinal cord, the tongue and the brain has a direct connection through cranial nerve. In case when a person has a severe spinal cord injure or other damage, the tongue will remain mobile to activate the system. *"Tongue movements are also fast, accurate and do not require much thinking, concentration or effort."* said Maysam Ghovanloo, an assistant professor in the Georgia Tech School of Electrical and Computer Engineering.

The motions of the magnet attached to the tongue are spotted by a number of magnetic field sensors installed on a headset worn outside or an orthodontic brace inside the mouth. **The signals coming from the sensors are wirelessly sent to a portable computer** that placed on a wheelchair or attached to an individual's clothing.

The Tongue system is developed to recognize a wide array of tongue movements and to apply specific movements to certain commands, taking into account user's oral anatomy, abilities and lifestyle.*"The ability to train our system with as many commands as an individual can comfortably remember is a significant advantage over the common sip-n-puff device that acts as a simple switch controlled by sucking or blowing through a straw,"* said Ghovanloo.

The Tongue Drive system is **touch-free, wireless and non-invasive technology** that needs no surgery for its operation.

During the trials of the system, six able-bodied participants were trained to use tongue commands to control the computer mouse. The individuals repeated several motions left, right, up and down, single- and double-click to perform computer mouse tasks.

The results of the trials showed **100 percent of commands were accurate** with the response time less than one second, which equals to an information transfer rate of approximately 150 bits per minute.

Scientists also plan to test the ability of the system to operate by people with severe disabilities. The next step of the research is to **develop software to connect the Tongue Drive system to great number of devices** such as text generators, speech synthesizers and readers. Also the researchers plan to upgrade the system by introducing the standby mode to allow the individual to eat, sleep or talk, while prolonging the battery life.

Source: **National Science Foundation**

Text E

Innovations in science and technology: Computers

The world of computers has taken giant strides forward in the past 50 years, many of which are the direct result of research in physical areas like plasma physics, nanotechnology, quantum mechanics, superconductors and others. This research is ongoing, delivering even smaller devices that can perform billions of calculations in the palm of your hand.

By choosing a research career, this could be part of your legacy.

A brief history:

- **1940′s** – Researchers from Iowa State College develop the first electronic digital computer. ENIAC, the first large scale electronic computer, is built under a US Army contract. Bell Lab scientists John Bardeen, Walter Brattain and William Shockley invent the solid-state transistor (Nobel Prize, 1956).
- **1945** – John von Neumann of the Institute for Advanced Study publishes the design for the modern computer, in which software replaces ENIAC's hard-wired programs.
- **1950′s** – There are 10 computers in the US in 1951. UNIVAC, the first commercially available computer, is delivered to the Census Bureau. The first commercial magnetic hard-disk drive and the first microchip are introduced. Transistors are first used in radios.
- **1960-70** – Ken Olson, president, chairman and founder of Digital Equipment Corporation, maintains that "there is no reason why anyone would want a computer in

their home." The first microprocessor, soft "floppy disks," and personal computers are all introduced. Integrated circuits are used in watches.

- **1980′s** – The first Apple Macintosh and IBM PCs enter the marketplace. High-capacity hard drives get bundled with home computers. SEMATECH, a research consortium of US semiconductor companies and the government, is formed and helps to regain US leadership in the industry. The idea of quantum computers is first developed by Paul Benioff of Argonne National Laboratory and Richard Feynman of Caltech (Nobel Prize, 1965).
- **1990′s** – California builds more transistors in a year than the total number of raindrops that fall annually in that state. PDAs and digital cameras are among the new products that use computer chips. Very simple prototype quantum computers are built at MIT, Berkeley, NIST, IBM, Los Alamos and many other labs.
- **2002** – The first commercial quantum-cryptography products appear.
- **2006** – As conventional technologies reach their limits, new research areas such as molecular computing, spintronics, and quantum information science promise new ways to make computers even faster and more efficient.

Text F

Graduate programs for a career in computer innovation

If you are interested in doing cutting-edge research in computer technology, you might be surprised to learn that the relevant research areas go beyond computer science and engineering. You might explore graduate programs in the following fields:

- Computer science - Some possible areas of focus: computation, programming, designing systems and machine processes, scientific modelling, and software development.
- Condensed matter physics – Some possible areas of focus: semiconductors, optical properties of materials, innovations in CPU and chip design.
- Applied physics and applied math Some possible areas of focus: new programs and methodologies for data analysis, scientific software development, and scientific modelling.
- Atomic, Molecular and Optical Physics - Some possible areas of focus: quantum mechanics and quantum computing.
- Nanoscience and Technology - Some possible areas of focus: nanotechnology and nanoelectronics.

Text G

Crash-tolerant data storage

Formally verified working file system could lead to computers guaranteed never to lose your data.

In a computer operating system, the file system is the part that writes data to disk and tracks where the data is stored. If the computer crashes while it's writing data, the file system's records can become corrupt. Hours of work could be lost, or programs could stop working properly.

At the ACM Symposium on Operating Systems Principles in October, MIT researchers will present the first file system that is mathematically guaranteed not to lose track of data during crashes. Although the file system is slow by today's standards, the techniques the researchers used to verify its performance can be extended to more sophisticated designs. Ultimately, formal verification could make it much easier to develop reliable, efficient file systems.

"What many people worry about is building these file systems to be reliable, both when they're operating normally but also in the case of crashes, power failure, software bugs, hardware errors, what have you," says Nickolai Zeldovich, an associate professor of computer science and engineering and one of three MIT computer-science professors on the new paper. "Making sure that the file system can recover from a crash at any point is tricky because there

are so many different places that you could crash. You literally have to consider every instruction or every disk operation and think, 'Well, what if I crash now? What now? What now?' And so empirically, people have found lots of bugs in file systems that have to do with crash recovery, and they keep finding them, even in very well tested file systems, because it's just so hard to do."

Proving ground

Zeldovich and his colleagues — Frans Kaashoek, the Charles A. Piper Professor in MIT's Department of Electrical Engineering and Computer Science (EECS); associate professor of computer science Adam Chlipala; Haogang Chen, a graduate student in EECS; and Daniel Ziegler, an undergraduate in EECS — established the reliability of their file system through a process known as formal verification.

Formal verification involves mathematically describing the acceptable bounds of operation for a computer program and then proving that the program will never exceed them. It's a complicated process, so it's generally applied only to very high-level schematic representations of a program's functionality. Translating those high-level schema into working code, however, can introduce myriad complications that the proofs don't address.

"All these paper proofs about other file systems may actually be correct, but there's no file system that we can be sure represents what the proof is about," Ziegler says.

What distinguishes the MIT researchers' work is that they prove properties of the file system's final code, not a high-level schema. To do that, they took advantage of a tool known as a proof assistant, which provides a formal language for describing aspects of a computer system and the relationships between them.

"This formal proving environment includes a programming language," Chlipala explains. "So we implement the file system in the same language where we're writing the proofs. And the proofs are checked against the actual file system, not some whiteboard idealization that has no formal connection to the code."

The proof assistant, known as Coq, provided the tools, but the MIT researchers still had to do the work. First, they had to describe the components of a file system using Coq's formal language. "You have to define, 'What is a disk?'" Zeldovich says.

"And 'What is a bit?'" Chlipala adds.

Next, they had to formally describe the relationships between the behaviors of these different components under crash conditions. Only then could they begin to construct a proof that a file system would behave the way it should. Finally, they had to write the corresponding file system. The part of the process that Coq automated was determining that the file system did, in fact, adhere to the logical relationships described in the proof.

Reproducibility

In the course of writing the file system, they repeatedly went back and retooled the system specifications, and vice versa. But even though they rewrote the file system "probably 10 times," Zeldovich says, Kaashoek estimates that they spent 90 percent of their time on the definitions of the system components and the relationships between them and on the proof.

"We've written file systems many times over, so we know exactly what it's going to look like," Zeldovich says. "Whereas with all these logics and proofs, there are so many ways to write them down, and each one of them has subtle implications down the line that we didn't really understand."

"No one had done it," Kaashoek adds. "It's not like you could look up a paper that says, 'This is the way to do it.' But now you can read our paper and presumably do it a lot faster."

"It's not like people haven't proven things in the past," says Ulfar Erlingsson, lead manager for security research at Google, who has observed the new work from a distance. "But usually the methods and technologies, the formalisms that were developed for creating the proofs, were so esoteric and so specific to the problem that there was basically hardly any chance that there would be repeat work that built up on it. But I can say for certain that Adam's stuff with Coq,

and separation logic, this is stuff that's going to get built on and applied in many different domains. That's what's so exciting."

Module 2
Construction

Translate the texts

Text A

Building Construction Techniques

Building construction is the process of adding structure to real property. The vast majority of building construction projects are small renovations, such as addition of a room, or renovation of a bathroom. Often, the owner of the property acts as laborer, paymaster, and design team for the entire project. However, all building construction projects include some elements in common - design, financial, and legal considerations. Many projects of varying sizes reach undesirable end results, such as structural collapse, cost overruns, and/or litigation reason, those with experience in the field make detailed plans and maintain careful oversight during the project to ensure a positive outcome.

Building construction is procured privately or publicly utilizing various delivery methodologies, including hard bid, negotiated price, traditional, management contracting, construction management-at-risk, design & build and design-build bridging. Trump International Hotel and Tower (Chicago) May 23, 2006 September 14, 2007

Residential construction practices, technologies, and resources must conform to local building authority regulations and codes of practice. Materials readily available in the area generally dictate the construction materials used (e.g. brick versus stone, versus timber). Cost of construction on a per square metre (or per square foot) basis for houses can vary dramatically based on site conditions, local regulations, economies of scale (custom designed homes are always more expensive to build) and the availability of skilled tradespeople. As residential (as well as all other types of construction and manufactured homes) can generate a lot of waste, careful planning again is needed here.

The most popular method of residential construction in the United States is wood framed construction. As efficiency codes have come into effect in recent years, new construction technologies and methods have emerged. University Construction Management departments are on the cutting edge of the newest methods of construction intended to improve efficiency, performance and reduce construction waste.

There are several foundation types we are using in constructions such as pile foundation, raft foundation, pad foundation, combined footing, rubble foundation and spread footing. The selection of foundation type depends on the soil condition and the load about to apply on it. We commonly use pile foundations where apply heavy load such as several stories building. For normal houses we use rubble works with pad foundation type. A column foundations we use spread footing type.

Text B

Modern methods of construction (MMC)

The concrete industry embraces innovation and modern methods of construction (MMC) by offering concrete solutions which can be used to reduce construction time and promote sustainable development, as well as offering cost savings.

Precast Flat Panel System

Floor and wall units are produced off-site in a factory and erected on-site to form robust structures, ideal for all repetitive cellular projects. Panels can include services, windows, doors and finishes. Building envelope panels with factory fitted insulation and decorative cladding can also be used as load-bearing elements. This offers factory quality and accuracy, together with speed of erection on-site.

3D Volumetric Construction

3D Volumetric construction (also known as modular construction) involves the production of three-dimensional units in controlled factory conditions prior to transportation to site.

Modules can be brought to site in a variety of forms, ranging from a basic structure to one with all internal and external finishes and services installed, all ready for assembly. The casting of modules uses the benefits of factory conditions to create service-intensive units where a high degree of repetition and a need for rapid assembly on-site make its use highly desirable.

This modern method of construction offers the inherent benefits of concrete, such as thermal mass, sound and fire resistance, as well as offering factory quality and accuracy, together with speed of erection on-site.

Tunnel Form

Tunnel form is a formwork system that allows the contractor to build monolithic walls and slabs in one operation on a daily cycle. It combines the speed, quality and accuracy of factory/offsite produced ready-mix concrete and formwork with the flexibility and economy of cast in-situ construction.

This fast-track method of construction is suitable for repetitive cellular projects, such as hotels, apartment blocks and student accommodation. It offers economy, speed, quality and accuracy, as well as utilising the inherent benefits of concrete, such as fire and sound resistance.

Further information can be found in the publication 'High Performance Buildings using Tunnel Form Concrete Construction' published by The Concrete Centre. Click here to download. To find out more click here.

Flat Slabs

Flat slabs are built quickly due to modern formwork being simplified and minimised. Rapid turnaround is achieved using a combination of early striking and flying formwork systems. Use of prefabricated services can be maximised because of the uninterrupted service zones beneath the floor slab; so flat slab construction offers rapid overall construction, as it simplifies the installation of services.

In addition to saving on construction time, flat slab construction also places no restrictions on the positioning of horizontal services and partitions. This offers considerable flexibility to the occupier, who can easily alter internal layouts to accommodate changes in the use of the structure. Post tensioning of flat slabs enables longer and thinner slabs, with less reinforcement, and hence offers significant programme and labour advantages.

Hybrid Concrete Construction

Hybrid Concrete Construction (HCC) combines all the benefits of precasting with the advantages of cast in-situ construction. Combining the two, as a hybrid frame, results in even greater construction speed, quality and overall economy. HCC can answer client demands for lower costs and higher quality by providing simple, buildable and competitive structures that offer consistent performance and quality.

Thin Joint Masonry

Thin Joint Masonry allows the depth of the mortar to be reduced from 10mm to just 3mm or less, resulting in faster laying and improved productivity, particularly on long runs of walling. Construction speed can be further increased by some 13.5 per cent using large-format concrete blocks, which have a face size equivalent to two traditional concrete blocks. The mortar cures rapidly, achieving full bond strength within one to two hours, eliminating the problem of 'floating' therefore enabling more courses to be laid per day.

Insulating Concrete Formwork

Insulating Concrete Formwork (ICF) systems consist of twin-walled, expanded polystyrene panels or blocks that are quickly built up to create formwork for the walls of a building. This formwork is then filled with factory produced, quality assured, ready-mixed concrete to create a robust structure. The expanded polystyrene blocks remain to provide high levels of thermal insulation and the concrete core provides robustness and good levels of sound insulation.

Precast Foundations

Precast concrete systems can be used to rapidly construct foundations. The elements are usually to a bespoke design and cast in a factory environment, giving assured quality for the finished product. The foundations are often supported by concrete piles and connected together.

These systems improve productivity, especially in adverse weather conditions, and reduces the amount of excavation required - particularly advantageous when dealing with contaminated ground.

Military technology

Text A

9 Amazing Military Technologies of the Future

The technological revolution in modern warfare isn't just a matter of super-lightweight uniforms, night goggles, and ultra-computerized weaponry. Consider the unmanned aerial vehicles better known as drones. Barely a blip on military blueprints a decade ago, drones now make up half of the U.S. Air Force fleet. And with the next generation of drones will come an eye-popping array of weapons and equipment designed to support and protect troops on the battlefield and on secret missions. **Here are nine military technologies being developed through the Defense Advance Research Projects Agency (DARPA)** and other parts of the military, working with defense contractors and other private companies. They all have the potential to change the face of war.

Robot Mules

From Massachusetts-based Boston Dynamics, which works closely with DARPA, an amazingly agile "pack mule" robot will one day be commonplace on military missions in the field.

The robot will carry gear, such as heavy backpacks that can slow down ground forces. The four-legged "mule" easily negotiates rocks and divots in the road and field. It is intended to follow a military unit of soldiers autonomously, catching up with the unit on field forays with supplies, including food and ammunition. Refinements have made the robot surprisingly quiet, an important characteristic on a secret mission. Future versions of the pack mule will be able to interpret verbal and visual commands.

Meshworm

One of the tiniest robots in development -- about the size of a fingertip -- the Meshworm moves and acts like a small earthworm. It propels itself inch by inch, using artificial muscles that mimic the way an earthworm moves, by stretching one part of itself forward, then pulling the rest of its body along behind it. The Meshworm can move silently into the tiniest places to report back data, such as temperatures inside a confined space. It can also record audio and maybe even video in future versions. Made entirely of synthetic fibrous material, it's nearly indestructible. You can step on it or hit it with a hammer and it will keep going because the fibers are not damaged by impact. Working alongside DARPA on the Meshworm are the Massachusetts Institute of Technology, Harvard University and South Korea's Seoul National University.

Microwave Ray Gun

This weapon is designed to inject blasts of sound directly into a person's head from a couple of hundred yards away. Microwaves enter the head directly through the skull, not the ear, so protective earplugs are useless. The inner ear will sense the microwave and recognize it as sound. And the microwave blast can be adjusted to create different kinds of sounds. Versions being developed include bulk microwave-emitting systems for the Army and small, rifle-style versions for the Marines and special operations forces. Some early versions have been field-tested in Iraq and Afghanistan. It's also envisioned that police could use versions of the gun for crowd control -- "sound bullets" instead of nonlethal rubber pellets. Sierra Nevada Corp., headquartered in Sparks, Nev., is working on a version of the microwave ray gun under a U.S. Navy research contract.

Live-Fire Trainers

In the near future, soldiers will receive their live-fire training and marksman training with the aid of special, robotically controlled Segway personal transport devices. Specially armored Segways, adapted by Marathon Targets of Sydney, Australia, are called "smart targets." They can move in a lifelike manner with unpredictable turns, stops and sprints, as would a real live target. Lifelike hardened plastic dummies on the Segways can be made up to look like enemies in uniform, terrorists or assassins. Such smart targets resemble live-fire combat much more than the old wooden pop-up targets that have been used for a century. Marathon is currently conducting tests with the U.S. Marines and other parts of the military as well as with Segway. Robotic live-fire training is sure to become routine in a few years.

Microwave Ray Gun

Though international agreements bar the militarization of space, researchers are nevertheless working on weapons that could be used in space – just in case. Existing agreements could someday expire and a space laser deployment would be seen as necessary if any other country moves toward deploying its own. As envisioned by scientists, a space-based laser could send a powerful destructive beam at, say, an enemy's ballistic missile site a few thousand miles away. Another possible application would be to use a space laser to provide protection against attacks made on U.S. satellites in orbit. Working on the space laser are the Sandia National Laboratory, the Massachusetts Institute of Technology and a number of defense contractors, including Northrop Grumman and Lockheed Martin.

Rock 'Em, Sock 'Em Robots

PAL Robotics in Barcelona, Spain, is developing advanced bipedal robots that can recognize people, enter buildings, avoid obstacles and pick up objects in their "hands." They also have voice recognition systems that can take verbal commands. The military envisions using these robots to enter buildings in danger zones or to bring emergency medical supplies across battle zones to help wounded soldiers. Consumer versions of the REEM line of robots are also coming. For peace time, they'll include robots that can serve drinks and snacks at public receptions, trade shows, parties, etc. Some will even be able to carry on limited conversations.

Robots that Mimic Human Movement

This robot, surprisingly agile and eerily anthropomorphic, is able to simulate the stress that soldiers put on their protective clothing, helping biohazard and other battle-wear makers refine their designs. Petman, also designed by Boston Dynamics, can walk, crawl and do calisthenics while wearing test suits and being exposed to chemical warfare agents in secure lab settings. The latest version of the robot, which will be phased into use in 2015, can even climb stairs, a huge engineering advance, considering the complexity and weight distribution required for that act.

Flybot

With the look and size of a lightning bug, this tiny robotic fly will be sent on reconnaissance missions in areas too dangerous for soldiers, including places contaminated by chemical or biological weapons. It weighs less than a pin and can be remotely controlled in flight. Developed at Harvard with support from DARPA, the Flybot engineers say it could also be used to find hidden chemical bombs. Later incarnations of the Flybot may also be able to rely on tiny solar power cells for propulsion.

Super Drone

The current generation of drones has already revolutionized warfare. Now imagine an unmanned ultra-high speed aerial surveillance drone that can reach speeds of 4,000 miles-per-hour and fly at altitudes of up to 100,000 feet with intercontinental range. Such a plane is currently in development at Lockheed Martin and Northrop Grumman under a classified contract from the Pentagon. The drone, alternately known as Aurora and SR 72, is expected to debut sometime after 2020.

Text B

Think of the translation for the movie into Ukrainian

New Drone Movie Trailer Asks Ancient Question With Modern Technology

Will Helen Mirren and Aaron Paul kill a child to save dozens of innocent people?

By Kelsey D. Atherton Posted December 4, 2015

A Reaper In *Eye In The Sky*

Napoleonic battlefields were smoky, smoggy places, covered in the blackpowder clouds that were the by-product of musket volleys. Dubbed "fog of war," the term persists in military circles--even after the literal fog itself was engineered away with smokeless powder--as a way to describe the uncertainty of what is happening in a battlefield. The first trailer for *Eye In The Sky*, a new film about drone warfare starring Helen Mirren and Aaron Paul, bypasses the fog of war and gives us instead a different moral quandary: What if we have perfect information about a battlefield, and still make the wrong choice?

The film, a British production directed by Gavin Hood (who also helmed *Ender's Game*), focuses on a fictional counter-terror operation in Kenya. The operation is commanded by Helen Mirren's Colonel Katherine Powell, who sets it up as a capture mission. Assisting her are American drone pilots (from the creatively named "Drone Ops Command" in Nevada), specifically the cautious Steve Watts, played by *Breaking Bad* alumni Aaron Paul. Alan Rickman is also there.

They are joined by an array of robots, including a camera drone disguised as a bird and one that is the size and shape of a tiny beetle. These are various stages of real, with bird drones further along than insect drones. (Hummingbird-sized tiny drone helicopters are much further along than both, with the British military already using them and American special forces testing them out.) Above them all in *Eye In The Sky* flies an MQ-9 Reaper at 22,000 feet, armed with just two hellfire missiles.

When the beetle drone reveals a bed covered in suicide bomb best parts, the drama changes from coordinating a capture to debating a drone strike. This is complicated further by the presence of a child playing within the missile's blast radius. Such is the moral conflict presumably at the heart of the film: Even with perfect knowledge, is it worth killing one innocent person to save likely dozens of others?

It's the military equivalent of the "trolley problem" frequently posed by philosophers: Given a trolley on a path to kill five people, the question asks, would you instead pull a lever that sends the trolley onto a different path, where it would kill a single person? It's a question that the makers of driverless cars are wrestling with, and it's likely one that military commanders struggle with regularly, especially in the targeted killing campaign. In real life, there is never perfect knowledge, so the characters in *Eye In The Sky* get to handle the debate with more information than any military has ever had in history.

Whether or not this question makes for a compelling film, or if the titular Eye goes from a camera to a killer remains to be seen. The film is set to premiere March 11th, 2016, so audiences can find out for themselves then. In the meantime, why not watch *The Fog Of War: Eleven Lessons from the Life of Robert S. McNamara* on Netflix, which is a masterwork in exploring the hubris of someone commanding a war, and the deep misgivings of decades spent wondering if they judged the situation wrong.

Text C

Can A Smarter Gun Prevent A Massacre?

This one has been gathering dust for a decade

By Matt Giles Posted December 4, 2015

Smart gun prototype

In the wake of another mass murder in the United States, which left 14 people dead at a holiday party in San Bernardino, California, plenty of smart people are asking: What can we do to stop the shooting?

Any mention of gun control is met with Second Amendment outrage. Criminal background checks have proved fallible (as in the Charleston, South Carolina church shooting this summer).

And no amount of mental health screening seems to work either. One solution to gun violence, however, has been sitting in a cabinet in a New Jersey lab for nearly a decade.

Michael Recce, a former Intel engineer, designed one of the most novel smart guns ever conceived in the early 2000s. It relies on what's called reflexive behavior. Our brains are wired to perform certain tasks the same way each time, whether it's swinging a golf club or signing our names. We unwittingly apply the same pressure, the same stroke, the same follow-through.

Recce's technology recognizes those factors for each gun owner, along with biometrics like the size of your hand and the distribution of length among your fingers, to make a gun that will only fire when its owner is holding it. With the help of the New Jersey Institute of Technology (NJIT), he and a few others have been trying to get it made ever since.

"We proved that your pressure the gun grip, when pulling the trigger, is the summation of brain and physical activity, and that it happens the same way every time," says Donald Sebastian, NJIT's senior vice president of research and development. and the man tasked with bringing Recce's gun to consumers.

Gun owners have balked at other smart guns because of their fallibility in emergencies. A weapon that requires an owner's fingerprint to fire may not line up when faced with a home intruder and an unsteady hand. Guns that use radio frequency identification technology require the owner to wear an RFID chip on a wrist band, which might get lost or be hard to find in a crisis. But Recce's gun actually knows it's owner.

And that type of technology would have prevented Adam Lanza from firing his mother's Bushmaster AR-15 rifle inside the Sandy Hook elementary school in 2012. It could have stopped Dylan Klebold and Eric Harris from gunning down 15 fellow students at Columbine in 1999 with guns bought by a friend. It would have left two New York City cops alive instead of executed in their squad car, in 2014, by a career criminal using a stolen handgun.

And it might have prevented the California slaughter, carried out by a couple using two assault rifles bought by another person. (It is still not clear how the couple obtained those guns.)

Illegal guns are used in one third of all mass shootings, according to *Mother Jones*, which looked at 62 such incidents that took place between 1982 through 2012. It found that less than a quarter of the 143 weapons used in the killings were legally-obtained guns. The majority, of course, were legal.

While no reliable figures exist on the number of illegal guns on America's streets, consider just one city: Chicago. In the first six months of this year, cops took 3,470 illegal guns off the street. Two years ago, in a special report on gun violence, the Department of Justice noted that 40 percent of state and federal inmates told researchers in 2004 that they had obtained their guns on the black market, from drug dealers, or by stealing them.

Smart gun technology

The technology in Recce's gun, which can be fitted to assault rifles, would make those guns useless to those criminals. Even if privately re-sold, Sebastian says the weapon, in theory, would require reauthorization through a licensed dealer.

That the technology isn't already on gun store shelves is a problem of politics and money. After the NJIT received $1.5 million a decade ago to develop the biometric sensors, and another $250,000 to create the control system that blocks the firing mechanism during unauthorized use, the money has dried up.

"We lost all the public [funding] and we can't get private funding because no one believes pro-gun activists would ever allow this smart gun to see the light of day," says Sebastian. It's happened before. In 2014, German gunmaker Armatix introduced a .22 caliber smart gun that uses RFID technology and found dealers in California and Maryland willing to sell it. That is, until protests and death threats forced those same stores to remove the iP1 from their shelves (Armatix filed for a chapter 11-style restructuring earlier this year).

Still, with the proper funding, Sebastian believes, NJIT could produce a field-tested, evaluated, and ready-for-market smart gun in two years. It could also produce grips and firing

mechanisms that could be retroactively installed on other guns. And it's the type of personalized technology that gun owners might actually find palatable.

But until the cash flows from investors or donors, the smart gun's disassembled parts continue to sit in a cabinet drawer. It doesn't even have a production name. "I don't care if you call it Aunt Sally," says Sebastian. He just wants to see it get made.

Ecology

Text A

Pay attention to translation of international agreements and organizations

The climate negotiations so far

The United Nations Framework Convention on Climate Change (UNFCCC) was adopted during the Rio de Janeiro Earth Summit in 1992. This Framework Convention is a universal convention of principle, acknowledging the existence of anthropogenic (human-induced) climate change and giving industrialized countries the major part of responsibility for combating it.

The adoption of the **Kyoto Protocol** at the Earth Summit in Rio de Janeiro, Brazil, in 1992 was a milestone in the international negotiations on tackling climate change. For the first time, binding greenhouse gas emissions reduction targets were set for industrialised countries. The protocol, which entered into force in 2005, was intended to cover the period 2008-2012.

A longer-term vision was introduced by the **Bali Action Plan** in 2007, which set timelines for the negotiations towards reaching a successor agreement to the Kyoto Protocol, due to expire in 2012. It was expected that an agreement would be reached by December 2009.

Although **Copenhagen** , Denmark, did not result in the adoption of a new agreement, COP15/CMP5 recognised the common objective of keeping the increase in global temperature below 2°C. Furthermore, industrialised countries undertook to raise $100 billion per year by 2020 to assist developing countries in climate-change adaptation and mitigation. Cancún, Mexico, in 2010 made the 2°C target more tangible by establishing dedicated institutions on key points, such as the Green Climate Fund.

The willingness to act together was reflected in the establishment, in 2011, of the **Durban** Platform for Enhanced Action (ADP), whose mandate is to bring all countries, both developed and developing, to the table to develop "a protocol, another legal instrument or an agreed outcome with legal force" applicable to all the States Parties to the UNFCCC. This agreement should be adopted in 2015 and implemented from 2020.

In the interval until a legally binding multilateral agreement is implemented in 2020, the **Doha Conference** (Qatar) in 2012 established a second commitment period of the Kyoto Protocol (2013-2020), which was ratified by a number of industrialised countries, and terminated the Bali track.

The Climate Change **Conferences in Warsaw** , Poland, in 2013 and **Lima** , Peru, in 2014 enabled essential progress towards COP21 in Paris in 2015. All the States were invited to submit their Intended Nationally Determined Contributions (INDCs) towards reducing greenhouse gas emissions ahead of COP21.

One year of negotiations

In order to reach a new universal climate agreement that is applicable to all, the delegates of the 195 States Parties to the United Nations Framework Convention on Climate Change (UNFCCC) have held regular meetings to make progress on the text that will be voted on in Paris in December.

During the first **session of negotiations**, from 8 to 13 February in Geneva (Switzerland), they built on the work carried out during COP20 in Lima (Peru), from 1 to 14 December 2014. After a week of work, the delegates agreed on an 86-page text that would serve as a basis for the following four sessions. The last session was held from 19 to 23 October in Bonn (Germany), where the UNFCCC is based. The 1300 delegates finalized the text that will be discussed at COP21.

In parallel to the negotiation process, the French Minister of Foreign Affairs and International Development and future president of COP21, Laurent Fabius, held two rounds of **informal ministerial consultations**, in July and September, in Paris. The aim of these work sessions was to reach compromises to enable the negotiations to move forward. Each of these meetings was attended by over fifty ministers.

This year of negotiations was marked by the publication on 7 October of the **climate finance report by the OECD and the think tank Climate Policy Initiative**. According to this report, $62 billion were raised in 2014 by developed countries to help developing countries cope with climate change. This news showed that the commitment made by developed countries in Copenhagen in 2009 to raise $100 billion per year by 2020 is within reach.

In addition to the financial aspect, the other highlight was the publication of the **UNFCCC synthesis report on national contributions** on 30 October. Countries had until 1 October to publish their road maps on their greenhouse gas (GHG) emission reduction policies if they were to be included in the synthesis report. The UNFCCC studied the impact of 146 national contributions. As things stand, the global GHG emission pathway based on the published contributions would mean that by 2030 we would be heading for a rise of around 3°C, that is between 2.7°C and 3.5°C, by the end of the century. The worst-case scenario, with a rise of 4.5°C or even 6°C, which corresponds to current emission pathways and was until now considered the most probable scenario by scientists, is growing less likely. Thanks to these contributions, the target of 2°C by 2100 may be reached, provided we speed up the process. One of the challenges of the Paris agreement will be to establish a periodic – ideally five-year – review mechanism to raise the ambition of each Party and progressively improve our collective pathway.

The last stage before COP21 was the pre-COP, from 8 to 10 November in Paris. More than 60 ministers from around the world answered Minister of Foreign Affairs and International Development Laurent Fabius' invitation for the **pre-COP**, which was the largest, most productive one in the history of the UNFCCC. These three days of work helped achieve major progress ahead of Paris.

Module 3
Economics

Text A

Translate the text

For over a week, investors have been closely watching sharp changes in share prices on China's stock market. Some investors say the wild movements have intensified because of concerns about the truthfulness of that nation's economic reports. Critics say the reports can fool investors by presenting an unrealistically-strong picture of the economy.

An expert on China says the government is not inventing the economic information. But, he believes that the economy is changing quickly from traditional industries to services. He says the ways of measuring this new economic activity are unable to keep up with the changes.

China is the world's second-largest economy, a huge trading nation and major importer of everything from machinery to oil and other natural resources. For this reason, its economic problems affect trading partners and stock markets around the world.

Stock prices in Shanghai and overseas markets have been in the news, in part, because of fears that China's economy is not growing as fast as some investors expect.

Weakness worries investors. And when many frightened investors sell stocks, it drives down prices. The fears intensify when financial experts worry that China's economy is weaker than the official reports show.

Ben Willis is a trader on the New York Stock Exchange.

"The Chinese economy, we thought, was growing at seven percent. It's probably only growing at half that. So a 50 percent reduction means you need to re-price, and that's what you're seeing going on in the stock markets and in the **commodity** markets."

Expansion of major industries was part of economic growth in China.

Nick Lardy is an expert on the Chinese economy. He works for the Peterson Institute for International Economics in Washington, D.C. He says China is better than most developing economies at measuring industrial production, especially from state-owned businesses. But he says much of the economic growth is now coming from the service industry, which is made up largely of smaller, private companies.

"Everything from **retail** and **wholesale**, **restaurants** and hotels, financial services, including banking**, insurance**, **securities**, asset **management**…"

Nick Lardy says restaurants are a good example of the growing services sector.

"When I first went to China, there were practically no restaurants. Now there are millions and millions of restaurants. Collecting the data on all these small firms in the restaurant business is very, very labor intensive. "

He adds that better, more detailed records would help Chinese leaders make better-informed decisions on economic issues. But he says the group of workers collecting economic **data** in China is very small in comparison to the size of its huge, fast-changing economy.

Text B

Fill in the gaps with topical vocabulary

China's economy again has made news as the country works to deal with a **volatile** _____ and slowing exports. Those _____ have influenced markets around the world.

China's **benchmark** _____, the Shanghai Composite Index has been _____ since June when it reached a high of over 5,000 points. As of Wednesday, the index had decreased more than 40 percent. Stock prices have _____ and _____ _____ sharply.

Financial markets around the world have shown increased _____ in recent weeks, in part, influenced by events in China. Indexes for _____ in Japan, Hong Kong, and South Korea have all shown volatility. And share prices in major European indexes in _____, _____ and _____ have decreased in the last month.

China has taken several steps to try to put a halt to slipping _____. The government made billions of dollars in _____ _____ to banks and money market funds. In July, stock exchanges halted trading of 1,400 listed stocks in an effort to stop prices from falling.

On Tuesday, China's central bank again moved to make borrowing easier in an effort to support the economy and stop sharp decreases in the country's stock markets. The bank reduced a main _____ by .25 percent to 4.6 percent. China also reduced the amount of money banks must hold in reserve giving banks more money to lend. The People's Bank of China also provided more than $23 billion in _____ _____ to increase money available to banks and investors.

Earlier this month, Chinese officials _____ the country's currency, the yuan. Within two days, the yuan lost more than three percent in value. That _____ years of slow increases in the _____ of China's currency. The devaluation came on growing evidence that China's economy is slowing.

In early August, China reported that its exports _____ by 8.3 percent in July compare to the year before. That was more than expected and added to concerns about China's economy.

Slowing growth in China, the world's second biggest economy, is not unexpected. Kevin O'Leary of O'Shares Investment says growth predictions for China may have to change.

"Instead of thinking of China growing at 8 percent, we think, it's going to grow 5 or 6 percent," he said. "That's 20 percent less growth than **anticipated**."

Economist Nicholas Lardy is with the Peterson Institute for International Economics. He is a leading expert on China's economy.

"I think the main reason China matters so much is it's the second biggest economy in the world. It's the second largest trading economy, so if China's economic performance suffers, the rest of the world is going to pay a price."

Text B

China is Vietnam's biggest _____ partner. However, the two countries are _____ in international trade. Now, Vietnam is taking steps to _____ China's surprise decision to _____ its _____. Vietnam is also making an effort to _____ its _____ in a very competitive part of the world.

In August, the value of China's money fell by 3.5 percent against other currencies in foreign _____. In recent months, the value of the Japanese yen, the Korean won and other Asian currencies also fell. That made exports from those countries less _____.

Vietnam let the value of its currency, the dong, go down two times earlier this year. The idea was to _____ more foreign _____ in the country.

_____ is an important part of Vietnam's economy. In fact, the manufacturing **sector** grew by nearly nine percent last year. However, Vietnam faces strong competition from its trading partners. Vietnam also could _____ a _____ of Chinese imports as China seeks new markets for its _____. The reason for those imports: slowing _____ for goods in China.

Pham Luu Hung is with SSI Research in Hanoi. He says low _____ and problems in China are resulting in more shipments of Chinese trucks and steel to Vietnam.

"We share a border with China, so we import a lot from China, so if the economy is slowing down, I think **cheap** Chinese products would be easier to come in to flood the market here."

Infrastructure investment is becoming a major trade issue

Some Asian countries are _____ roads, air and sea ports, and other _____ in an effort to increase trade. The Philippines has _____ work on infrastructure this year. Philippine _____ note that the country has an English-speaking _____, which can _____ to foreign investment.

Like many Southeast Asian nations, Vietnam is seeking money for infrastructure projects. The planned improvements are to meet the demands of international _____.

Vietnam has accepted _____ _____ from Japan to build a new airport terminal in Hanoi. The building is expected to open this year. More aid has gone to help build Ho Chi Minh City's public transportation system, which has yet to open.

With better infrastructure and _____ _____, Vietnam hopes to develop _____ manufacturing industries to replace the clothing industry. Major technology companies, such as Intel in the U.S. and Samsung in South Korea, have invested billions of dollars in Vietnam since 2010.

Sandeep Mahajan is an economist with the World Bank. He says Vietnam needs to do more to make land and financing _____ to private businesses. That way, he says, local companies can join the factory _____. Today, investors from other Asia countries _____ factories that receive parts and _____ _____ in China,

An increase in private investment could raise _____ in a country where 12 percent of people live in _____. Vietnam's trade relationship with China is _____ at $50 billion in trade a year.

Engineering

Text A

Female engineers are few

Not enough American students want to be engineers, mathematicians, or scientists. The Obama administration wants to change that. They are spending money to do it. The government will invest three billion dollars in the education of young Americans in science, technology, engineering, and math. The four areas together are known as **STEM**.

Many jobs in the STEM fields will open in the coming years. The U.S. government's investment aims to increase the number of Americans who can take those jobs.

Yet girls appear far less interested in STEM subjects than boys. Only 25 percent of STEM students are girls.

Camsie McAdams is at the U.S. Education Department. She says girls simply do not feel welcomed in STEM subjects. Ms. McAdams says young women look at industries such as engineering and computer science and see most of the leaders are men.

"We, as women, want to have people that look like us, people that we can relate to. A lot of times what distracts people from entering the field, or, even when they get the degree, keeps them from wanting to work in the field, is because they don't feel welcomed."

Debbie Sterling is an engineer. She invented a **construction** toy for girls. The name of the toy is "Goldie Blox." Ms. Sterling hopes Goldie Blox will help girls develop **spatial** skills. Spatial skills help engineers and builders to think about objects in three **dimensions**.

To interest girls, Sterling created the character "Goldie." Goldie does not care about beauty or clothes. Goldie tells stories, solves difficult problems and creates **pretend** worlds.

Mia is a seven-year-old girl who likes science. In her room, she has no fashion dolls. Instead, she has a pegboard, wheels, blocks and an inventor's journal to write her observations. Mia received a set of Goldie Blox from her grandmother. She learned to make a machine with the blocks.

"When my grandmother first sent me the present, a spinning machine, I was really excited. I knew it had to do with engineering, so I grabbed the box and opened it. Then I went for more -- I went to the web site; I went on YouTube to find more videos. My mom asked me why I was just watching videos instead of building. I told her I didn't have enough pieces. She got me the builder survival kit."

Experts say parents should do more than just buy toys to interest their girls in STEM subjects. They should also provide a good education. At school, girls should participate in projects that require teamwork and creative thinking.

Women in scientific and **technical** jobs are also working to encourage young women to explore STEM. One is Anu Tewary. She studied Applied Physics and worked for technology companies. After she had a daughter, she started Technovation Challenge. The challenge is an international competition for young women from 10 to 18 years old.

Technovation offers girls the opportunity to learn how to start a company and become high-tech **entrepreneurs**. Since 2009, over 2,500 girls from 28 countries have developed 650 mobile phone applications. They learned to launch start-up companies through Technovation.

There's a good chance that soon, more young women using mobile phones will also be developing programs for them.

Text B

Fill in the gaps with topical vocabulary

Inventions that save lives!

This is Science in the News, in VOA Special English. I'm June Simms. Today Shirley Griffith and Bob Doughty tell about two recent inventions that have helped to save lives. We will also tell about the people who developed them. **History of Seat Belts** Most cars have seat belts as part of their _____. Seat belts protect drivers and passengers in case of accident. They also _____ the effect of a crash on the body. Safety experts estimate that the _____ devices save thousands of lives a year in the United States alone. Worldwide, some experts, say the _____ have protected up to a million people. The first _____ _____ was said to have been created in the 1800s by George Cayley of England. He is remembered for many inventions, especially for early "flying machines." The United States first _____ the invention of an automobile seat belt in 1849. The government gave a patent to Edward J. Claghorn of New York City so that others would not copy his invention. Claghorn called the

device a _____. It was said to include hooks and other _____ for securing the person to a _____ object. **Modern Seat Belt Developed in Swede**n. Other _____ followed with different versions of the seat belt. But more than 100 years passed before the _____, widely used seat belt was developed. It _____ from the work of a Swedish engineer, Nils Bohlin. His three-point, lap and shoulder seat belt first appeared on cars in Europe 50 years ago. Bohlin was born in Sweden in 1920. After completing college, he designed seats for the _____ _____ industry. The seats were built for the pilot to _____ from an airplane in case of disaster. Bohlin's work with planes showed him what could happen in a crash at high speed. In 1958, Bohlin brought that knowledge to the Swedish car _____ Volvo. He was the company's first chief _____ _____. At the time, most safety belts in cars crossed the body over the _____. A buckle held the restraints in place. But the position of the buckle often caused severe _____in bad crashes. Nils Bohlin recognized that both the upper and lower body needed to be held securely in place. His invention contained a cloth _____ that was placed across the chest and another strap across the hips. The design _____ the straps next to the hip. Volvo was the first automobile manufacturer to offer the modern seat belt as a _____ addition to its cars. It also provided use of Nils Bohlin's design to other car-makers. The Swedish engineer won many honors for his seat belt. He received a gold medal from the Royal Swedish Academy of Engineering Sciences in _____. He died in Sweden in _____.

Sociology

Text A

Translate into English

Основним елементом суспільства, будь-якої форми соціальності є людина. Оскільки особистість є продуктом соціуму, то особливе місце серед соціально-психологічних дисциплін посідає соціологія особистості.

Соціологія особистості — це галузь соціології, яка вивчає особистість як об'єкт і суб'єкт соціальних відносин крізь призму суспільно-історичного прогресу, ціннісних суспільних систем, взаємозв'язків особи і соціальних спільнот.

Об'єктом даної галузі є соціальний суб'єкт, зокрема людина й особистість, а предметом — соціальна сутність людини та закони становлення і змін особистості у процесі життя.

Особистість є об'єктом вивчення багатьох гуманітарних дисциплін — філософії, психології, антропології, соціології та ін. Специфіка соціологічного підходу до особистості полягає в тому, що соціологія намагається дослідити людину як найважливіший елемент суспільного життя, виділити її соціальні характеристики, визначити весь спектр її взаємодії з суспільством, з соціальними спільнотами, з іншими індивідами. Інакше кажучи, у соціології особистість розглядається не як продукт природи, а передусім як сукупність суспільних відносин, продукт суспільства Особлива увага у соціології особистості приділяється дослідженням взаємозв'язків параметрів соціальних структур та особистісних якостей людей у відповідних соціальних групах. Без дослідження системи особистості, без вивчення процесів, які охоплюють повсякденні міжособистісні відносини, неможливо зрозуміти соціальні процеси, які управляють складними структурами суспільств.

Anatomy

Text A

Translate into English

Перші згадки про будову людського тіла зустрічаються в Стародавному Єгипті. У XIX столітті до н.е. єгипетський лікар Імхотеп описав деякі органи та їх функції, зокрема головний мозок, діяльність серця, поширення крові по судинах. У старокитайської книзі "Нейцзин" (XI-VII ст. до н. е.) згадуються серце, печінка, легені та інші органи тіла

людини. В індійській книзі "Аюрведа" ("Знання життя", IX ст. до н.е.) міститься великий обсяг анатомічних даних про м'язи, нерви, типи статури і темпераменту, головного і спинного мозку.

Протягом XVII-XVIII ст. з'являються не тільки нові відкриття в області анатомії, але і починає виділятися ряд нових дисциплін: гістологія, ембріологія, порівняльна і топографічна анатомія. Після відкриття Гарвея ще залишалося незрозумілим, як кров переходить з артерій у вени, але Гарвей передбачив існування між ними непомітних анастомозів, що і було підтверджено пізніше Марчелло Мальпігі (1628-1694), коли був винайдений мікроскоп. Мальпігі зробив багато відкриттів в області мікроскопічного будови шкіри, селезінки, нирок і ряду інших органів. Мальпігі відкрив передбачені Гарвеєм капіляри, але він вважав, що кров з артеріальних капілярів потрапляє спочатку в "проміжні простори" і лише потім в капіляри венозні. Тільки Шумлянський (1748-1795), вивчив будова нирок, довів відсутність проміжних просторів" і наявність прямого зв'язку між артеріальними і венозними капілярами. Таким чином, Шумлянський вперше довів, що кровоносна система замкнута.

Нормальна (систематична) анатомія людини — розділ анатомії людини, що вивчає будову "нормальної", тобто здорової людини по системах органів, органах і тканинах. Орган - частина тіла певної форми та будови, що має певну локалізацію в організмі та виконує певну функцію (функції). Кожен орган утворений певними тканинами, що мають характерний клітинний склад. Органи, об'єднані анатомічно і функціонально, що мають спільне походження і спільний план будови, утворюють систему органів.

Розділами нормальної (систематичної) анатомії людини є: остеологія — вчення про кістки, синдесмологія — вчення про сполучення частин скелету, міологія — вчення про м'язи, спланхнологія — вчення про внутрішні органи травної, дихальної та сечостатевої систем, ангіологія — вчення про кровоносну й лімфатичну системи, анатомія нервової системи (неврологія) — вчення про центральну й периферичну нервові системи, естезіологія — вчення про органи чуттів.

Linguistics

Text A

Translate the text

Мовознавство вивчає не лише мови, які існують (існували чи можливі в майбутньому), але й людську мову взагалі. Мова не доступна лінгвістові для прямого спостереження; безпосередньо спостережні лише факти мовлення, або мовні явища, тобто мовленнєві акти носіїв живої мови разом з їхніми результатами (текстами) або мовний матеріал (обмежений масив письмових текстів мертвою мовою, якою вже ніхто не користується як основним засобом спілкування).

Об'єкт і суб'єкт вивчення

Як гуманітарна наука, мовознавство не завжди відокремлює суб'єкт пізнання (психіку лінгвіста) від об'єкта пізнання (мови, що вивчається), особливо якщо лінгвіст вивчає свою рідну мову. Лінгвістами часто стають люди, які поєднують тонку мовну інтуїцію (чуття мови) із загостреною мовною рефлексією (здатністю замислюватися над своїм мовним чуттям). Опора на рефлексію для здобуття мовних даних називається інтроспекцією.

Environmental protection

Text A

Translate into English

Охоро́на довкі́лля (англ. *environmental protection / control / conservation*, нім. *Umweltwissenschaften*) — система заходів щодо раціонального використання природних ресурсів, збереження особливо цінних та унікальних природних комплексів і забезпечення екологічної безпеки. Це сукупність державних, адміністративних, правових, економічних, політичних і суспільних заходів, спрямованих на раціональне використання, відтворення і

збереження природних ресурсів землі, обмеження негативного впливу людської діяльності на навколишнє середовище.

Це більше ніж наукова дисципліна, перш за все — екологія, з якою її найчастіше розуміють чи плутають. Визначною особливістю є *практичний* напрям діяльності і широкий спектр соціально-культурних і природних відносин, яких вона стосується. В колишньому СРСР перший університетський курс на цю тему більше 30 років читав Кавтарадзе Дмитро Миколайович, який також був засновником і керівником однойменної лабораторії в МДУ ім. М. В. Ломоносова. На її базі були розроблені і впроваджені у навчальний процес по всьому СРСР ділові та імітаційні ігри, які дозволяють на практиці відчути характер природоохоронної діяльності, побачити цілісність і взаємопов'язаність світу.

Text B

Мета охорони навколишнього середовища — протидія негативним змінам у навколишньому середовищі, які мали місце в минулому, відбуваються зараз або можуть бути.

Актуальність охорони навколишнього середовища, що перетворилася в глобальну проблему, пов'язана головним чином зі зростанням антропогенного впливу. Це зумовлено демографічним вибухом, урбанізацією, що прискорюється, і розвитком гірничих розробок і комунікацій, забрудненням навколишнього середовища відходами, надмірним навантаженням на орні землі, пасовища, ліси, водойми. У результаті гірничо-технічної діяльності у світі порушено не менше 15 — 20 млн га земель, з них 59% площі використано під різні гірничі виробки, 38% — під відвали пустої породи або відходів збагачення, 3% — місця осідання, провалів та інших порушень поверхні, пов'язаних з підземними розробками. Інколи порушення правил ведення гірничих робіт чи масштабна аварія призводить до катастрофічних незворотних наслідків.

Заходами, спрямованими на охорону довкілля можуть бути:

- Обмеження викидів в атмосферу та гідросферу з метою поліпшення загальної екологічної обстановки.
- Створення заповідників, заказників і національних парків з метою збереження природних комплексів.
- Обмеження лову риби, полювання з метою збереження певних видів.
- Обмеження несанкціонованого викидання сміття. Використання методів екологічної логістики для тотального очищення від несанкціонованого засмічення території регіону.