МІНІСТЕРСТВО ОСВІТИ І НАУКИ УКРАЇНИ
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ФАКУЛЬТЕТ ІНОЗЕМНОЇ ФІЛОЛОГІЇ
ТА СОЦІАЛЬНИХ КОМУНІКАЦІЙ

СОЦІАЛЬНО-ГУМАНІТАРНІ АСПЕКТИ РОЗВИТКУ СУЧАСНОГО СУСПІЛЬСТВА

МАТЕРІАЛИ ВСЕУКРАЇНСЬКОЇ НАУКОВОЇ КОНФЕРЕНЦІЇ ВИКЛАДАЧІВ, АСПІРАНТІВ, СПІВРОБІТНИКІВ ТА СТУДЕНТІВ

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The result of numerical studies which was implemented with the help of software Simple Photonic Crystals was the building up of the Brillouin diagrams that could define forbidden and permitted bands and two-dimensional distribution of electromagnetic energy density. The results gained during the research give reasons to state that a stacking factor increase of dielectric material while using the rod structure leads to significant field concentration at the latest rods and reducing of the forbidden zone width. This fact shows that forbidden and permitted zone width can be controlled by changing geometrical parameters, which in its turn, has a positive effect on the frequency bandwidth of material transmission.

The calculations done during the experiments have proved that replacement of the rod structures on the hole, does not lead to significant changes in the band structure, but electromagnetic field density increases in the hole area that may result in bigger energy loses. But it is evident that the hole structure is more simpler to design and implement.

BRAIN – COMPUTER INTERFACE

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Brain -computer interface - the interface that implements the connection between the human brain and the computer. The main idea is that when you think about action and do it, the same part of the brain is activated.In the middle of the XIX century, Emil Du Bois- Reymond showed the relationship between electric current and nerve impulses; in 1875. Richard ketone managed to register the electrical activity of the brain of animals. The psychiatrist Hans Berger in 1924 invented a method to record the electrical activity of the human brain. In 1967, psychiatrist Edmond Dewan published a paper in which he described the experiment where a man was trying to send a message to electroencephalogram by means of dot-and-dash,using brain activity.One of the first practically implemented IMC is considered a virtual keyboard made by Farwell and Donchyn which was created in 1988.

One part of BCI initiation is realization of a computer program that can convert activity of a brain into a computer code. It is difficult because our brain consists of billions of neurons and brain convolutions have an individual location for every person, even for relatives. It means that if one

person does something it will arouse one part of a brain and if another one does an equal thing, it will arouse another part of the brain. But the source of a signal can be equal.Another part is to create a convenient stand-alone device that can catch brain signals and may be used in everyday life. When we do electro-encephalogram our head is totally covered with sensors, and the device is large enough.The main area of IMC application is medicine. Scientists are trying to allow the blind to see or use artificial limbs as their own. It can also be used in a gaming industry. Not long ago, children dreamed of having cars, controlled by radio and in less than a few years they are likely to begin dreaming of machines, guided by thoughts. Military industry is also interested in this technology.

One of such technologies is Brain Gate. This brain implant has been designed to help people who are out of control over their limbs. Sensors are implanted in the brain of a patient. They intercept brain signals and convert them into a code. As the developers say"However, if the patient still has the ability to “think” about movement, BrainGate™ has the potential to interpret and re-connect those signals, thus allowing the patient to move those limbs simply by thinking about it."Another invention is Emotiv Insight. It is designed for everyday use. Insight looks like a thin hoop that is worn on the head. It has several sensors, but the developers have created a program that can simulate brain convolutions in expanded form to analyze where the signal came from.It can monitor brain activity and record it. Emotiv Insight can be used by athletes to create a more effective workout. Another application of this invention is games. A small toy helicopter that can move with your thoughts can be taken as an example.Scientists are working to create IMC for a hardsuit which they call exoskeleton. Such exoskeleton, made for the lower limbs, was introduced at the World Cup in 2014, where one person with a partly paralyzed body made an opening kick on the ball. Full body exoskeleton was designed by the engineerSteve Jacobsen and his company Sarcos. Its name is XOS Exoskeleton. The move of an artificial body is not late in comparison with the motion of a human body and users didn’t feel uncomfortable. XOS was worn by the police on World Cup too.

Hybrid Assistive Limb (HAL) is another exoskeleton, made by Cyberdyne. HAL can enhance human strength five times. It is made of a different type of control. HAL doesn’t not intercept signals of direction in the brain. It intercepts signals, sent by the brain to the limbs immediately in them. This technology does not work directly with the brain, but it realizes communication between the brain and the computer.Scientists hope that in the future we can use IMC for creating music or modeling certain systems on a

computer by just thinking. Some of them begin even thinking about telepathy. It means that currently we can only imagine the number of areas that this technology will cover.

ИЗ ОПЫТА РЕАЛИЗАЦИИ ПРОЕКТОВ ПО ОКАЗАНИЮ ОБРАЗОВАТЕЛЬНЫХ ЯЗЫКОВЫХ УСЛУГ ВНЕШНИМ ЗАКАЗЧИКАМ

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Кафедра иностранных языков СумГУ, ее Лингвистический и научно-методический центр в частности, имеет многолетний опыт сотрудничества с предприятиями и организациями города Сумы. Лишь за последние 5 лет усилиями преподавателей кафедры совместно с администрациями и отделами технической учебы таких ведущих промышленных предприятий как ПАО им. Фрунзе и концерна "Гидромашсервис" были успешно реализовали проекты по обучению профессиональному английскому языку. Общее количество тех, кто прошел курс делового и технического английского языка на двух данных предприятиях, составило более 140 человек. Преподавателям кафедры пришлось работать с представителями самых разных структурных подразделений предприятий: дирекцией и управленческим аппаратом, конструкторами и разработчиками, службами технического и информационного обеспечения, работниками бухгалтерии.

Самым недавним примером подобного рода сотрудничества стала реализация проекта по обучению профессиональному английскому языку сотрудников миграционной службы Сумской области в ноябре-декабре 2015г. Инициатива исходила от самой службы, сотрудники которой уже долгие годы профессионально связаны с СумГУ в части предоставлении миграционных услуг иностранным студентам. Проект был задуман и осуществлялся в соответствии с решением правительства Украины объявить 2016 год годом английского языка. Актуальность и целесообразность проекта были еще раз подтверждены новым законом о государственной службе, принятым в декабре 2015г. на этапе завершения процесса обучения.

Изначально сторонами было согласовано решение о проведении практических занятий без отрыва от работы на площадке заказчика. Была предоставлена и включена в контракт информация о группе обучающихся из 12 сотрудников. В ходе ознакомительной беседы было определено