

Peter the Great St. Petersburg Polytechnic University and LUT Identified a Development Strategy for the Next Five Years

Peter the Great St. Petersburg Polytechnic University and LUT (Finland) signed a new strategic partnership agreement for the next five years. To celebrate the 5th anniversary of strategic partnership, a two-day International SPbPU - LUT Partnership Forum was held. Leading professors and scientists from both universities got together to share impressive results of the collaboration.



On September 26, an official meeting was held in the SPbPU New Research Building. The participants shared the results of the two universities' long-term partnership. The universities' leaders - SPbPU Rector, Academician of the Russian Academy of Sciences Andrei RUDSKOI and LUT Rector Juha-Matti SAKSA - welcomed the research groups. *"For many years, we have been conducting effective joint research in the framework of European international programs. Together, we have implemented more than a dozen of large-scale projects, published many joint articles based on the results achieved, and developed new technologies. It is especially significant that our projects are aimed at saving nature - our home - the North-West region,"* Andrei Rudskoi emphasized.

LUT Rector Juha-Matti SAKSA agreed with his Russian colleague, noting that one of the most global and large-scale projects in which the two universities are participating is the preservation of peace in the world. *“This is one of the most important tasks. We solve it using all our extensive scientific potential, involving key scientists from various fields, cooperating with leading world companies and training new generations of students. Today, we will see the results of our strategic partnership and discuss opportunities for future cooperation,”* added the Rector of LUT.



A series of reports was opened by a group of scientists who had conducted a joint research in the field of mathematical modeling. The group is moderated by professors Jari HÄMÄLÄINEN and Sergey LUPULYAK. Scientists spoke about hydrodynamic modeling of wind energy and wind generators, i.e., units that convert the kinetic energy of air masses into electric energy. Using the methods of computational fluid dynamics, you can accurately calculation of the most optimal location of the wind farm can be found to make the operation of wind generators as efficient as possible. It is noteworthy that for the calculations, scientists used the resources of the Supercomputer Center of Polytechnic University.

The following research results were presented by a scientific group working in the field of intelligent control systems. At SPbPU, the group is supervised by Professor Vyacheslav SHKODYREV, in LUT by Professor Heikki KÄLVIÄINEN. Cooperation between the universities in this area has been lasting for nearly 20 years. Today,

universities are implementing two Double Degree Master's programs, participate in joint projects in robotics and information technology, publish articles in highly rated journals, and invite professors to deliver lectures at partner universities. In addition, in last summer, an international conference on “Cyber-Physical Systems and Control” was held at SPbPU, where colleagues from LUT and other European universities took part.

A research group led by professors Paul KAH and Sergey PARSHIN presented the results of the joint research in the field of welding. “*Welding technologies are just everywhere,*” - Professor KAH underlined. A group of scientists conducted joint research on underwater welding. They studied the features of welding in low-temperature conditions: robotic welding technology, as well as comparing steel standards in Russia and Finland. One of the most difficult and interesting areas was the study of welding production based on artificial intelligence.



Professors Heikki HANDROOS and Andrei VOLKOV are supervisors of a working group that is studying various water treatment technologies. In particular, the researchers spoke about a unique device for complex water treatment that could replace the chlorine disinfection process. Water purification is carried out by making use of an innovative substance - sodium ferrate. It can decompose many toxic chemicals and have a purifying effect. These studies are carried out as part of the Cross-Border Cooperation Program “Russia - Southeast Finland 2014-2020”.

The supervisors of the group on electronics, nanomaterials, telecommunications and physics Valentina ZHURIKHINA and Erkki LÄHDERANTA talked about their work in the field of spintronics, photonics, nanophysics and nanotechnology. Based on the results of the research, scientists published over 20 joint articles, conducted a series of scientific seminars, and implemented a Double Degree Master's program.

An educational platform in the field of innovation in industry was introduced by a group of scientists led by professors Leonid CHECHURIN and Sergei REDKO. This project is implemented on the CEPHEI platform, which universities, authors, students and companies can work together on. Today, along with SPbPU and LUT, 7 Russian and foreign universities are present on the platform.



New areas of cooperation in the field of advanced digital technologies were presented by the scientific group comprising professors Aki MIKKOLA and Valery LEVENTSOV. The scientists talked about real-time simulations. Software based on this technology can carry out thousands of solutions made during the development process. Thus, engineers receive real-time feedback about their project, can significantly reduce development time, and choose the most optimal development paths.

The leaders of the scientific group in the field of software development - professors Pavel DROBINTSEV and Jussi KASURINEN also spoke about the prospects for Russian-Finnish cooperation. LUT and the Institute of Computer Science and

Technology are implementing a joint undergraduate program in Software Engineering. Research projects in Computer Science will be carried out, in particular in the field of artificial intelligence. Additionally, the parties confirmed the development of promising programs and research in the field of joint PhD programs.



Presentation of joint international educational programs and projects was made by Olga EMELYANOVA. The universities are especially proud of the Triple Master's Degree program in mechanical engineering, which SPbPU and LUT are implementing in cooperation with Leibniz University of Hanover. This is a unique experience not only for Russia and Finland, but also for the entire European educational space. Plans for the near future include the development of joint PhD programs, the launch of a Joint Student Project Marathon, and the work to increase the number of participants in academic mobility programs.

At the end of the series of reports, SPbPU and LUT Rectors signed a new Strategic Partnership Agreement and an Agreement on a Double Degree Master's program in physics, technical physics, electronics and nanoelectronics, information and communication technologies, and communication systems.

"I wish our universities to be able to say after the next five-year period: our strategic partnership is not just productive, it is MEGA productive! We all understand how important it is to be on the go, and how valuable it is to find

support from our partners and friends. I wish Peter the Great St. Petersburg Polytechnic University and LUT many years of successful cooperation and strong friendship, ”summarized Andrei RUDSKOI, SPbPU Rector.

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