

Polytechnic and the University of Aachen held the second joint workshop for young scientists “Smart Algorithms in Production”

SPbPU and RWTH Aachen Technical University (RWTH Aachen, Germany) held a joint workshop for young scientists on “Smart Algorithms in Production.” The event was a logical continuation of [a workshop on smart robotics in manufacturing](#), which took place in June 2020.

Innovative technologies, based on unique “smart” algorithms of information processing, are becoming more and more important in everyday life and solve problems in a wide variety of industries every year. The main goal of the workshop “Smart Algorithms in Production” was to establish new research contacts between young scientists and to identify the potential for joint projects and research.



Acting Director of the Institute of Computer Science and Technology Professor Lev UTKIN, researchers and graduate students of the Higher School of Cyberphysical Systems and Control, the Higher School of Applied Mathematics and Computational Physics, the Higher School of Biomedical Systems and Technologies Laboratory Industrial Data Stream Processing Systems” and Laboratory “Process Modeling and

Power Equipment Design” of the SPbPU NTI Center, representatives of international services took part in the seminar.

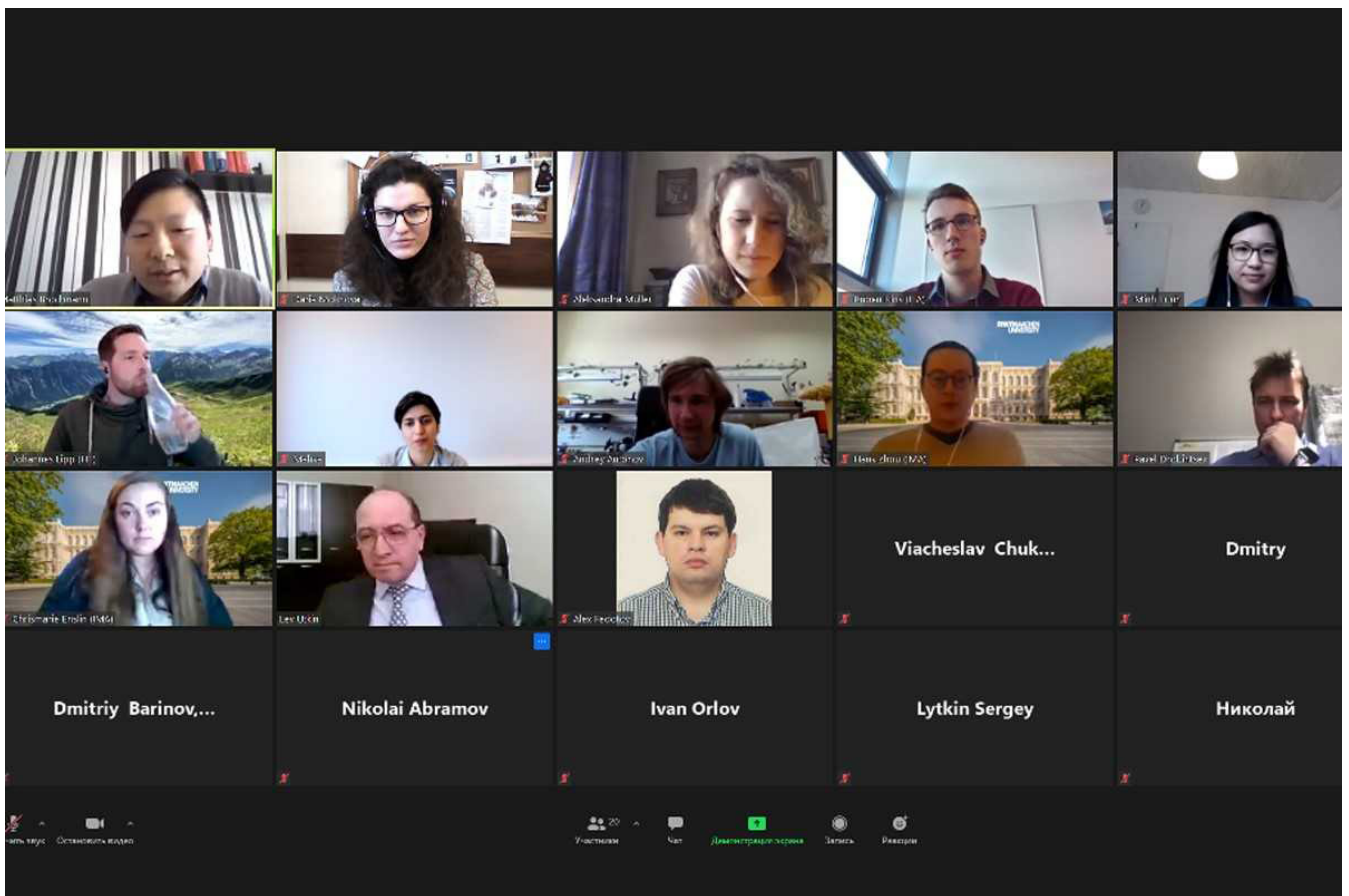
Aachen University was represented by Dr. Matthias BROCKMANN, head of an advanced cluster of Internet Manufacturing, researchers of the Department of Control and Automation Technologies, Department of Information Systems, Institute of Textile Engineering, Institute of Information Management in Mechanical Engineering, representatives of the Process and Data Science Group.

Dr. Matthias BROCKMANN opened the seminar. He spoke about the work of the advanced Internet manufacturing cluster, about the transfer of the Internet of Things into the manufacturing world, and about the joint work between SPbPU and the University of Aachen during the past year, which, despite the epidemiological situation and the inability to meet in person, is actively developing.

On behalf of SPbPU, the participants were welcomed by Professor Lev Utkin, Acting Director of IKNT. Lev Utkin presented the main activities of the institute and the areas of developments and projects in such areas as artificial intelligence, machine learning, cyber-physical systems, etc., and also gave an overview of the current projects of the Research Laboratory of Neural Network Technologies and Artificial Intelligence. “Meetings like today’s workshop are a great opportunity for young scientists to get to know each other, to present and discuss the intermediate results of their projects in a variety of fields, from light industry and construction to medicine and many other interesting fields. Direct communication of our scientists and postgraduate students with young researchers from Aachen is a guarantee of long-term scientific friendship,” said Lev Utkin.

The working part of the workshop was held in a pitch session format. Researchers and young scientists from Polytechnic University and Aachen University made presentations of their research and projects in a wide range of areas and topics, united by the common theme of smart algorithms.

SPbPU scientists presented their projects on studying changes in neural network activity caused by neurodegenerative diseases using artificial intelligence methods, told about [the development of methods and software and hardware for defect detection](#) in the textile industry using neural network methods, presented a report on how to achieve high-precision object synchronization of distributed systems, discussed artificial intelligence methods for analyzing an unstructured point cloud, visualization methods and deep learning for medical visualization, and touched upon the topics of information modeling in real estate management system and hybrid neural network model of industrial facility management and condition monitoring.



“The possibility of interaction with the University of Aachen is very important. The past seminars and meetings showed a great variety of directions for international scientific cooperation and the high activity of young researchers in Russia and Germany. I see here great prospects for the development of projects in many industries, including the light industry, construction, and medicine. Also, in my opinion, it is very useful for young polytechnic researchers to discuss their technology solutions with their colleagues from Aachen, it will allow them to look at their developments with fresh eyes and improve them,” said Marina BOLSUNOVSKAYA, Head of the Industrial Systems for Streaming Data Processing Laboratory at the SPbPU NTI Center.

RWTH Aachen scientists in their presentations shared their experience and developments in dynamic modeling of industrial robots using neural networks with physical plausibility, discussed methods and components for semantic web services, transfer learning capabilities for image-based quality control, self-optimizing machines for nonwoven production, promising mining technologies in manufacturing, and other topics.

“Our next joint workshop between Polytechnic University and the advanced Internet manufacturing cluster was a great success. We have a full year of sustained partnership under our belt. I would like to emphasize that interdisciplinary and international cooperation is especially important in the field of smart algorithms in manufacturing. SPbPU scientists and researchers are leaders in

the field of smart algorithms at the international level, and I very much appreciate and welcome our professional exchange,” emphasized Dr. Matthias BROCKMANN, Head of Advanced Internet Manufacturing Cluster at Aachen University.

At the end of the workshop, the participants showed mutual interest in each other’s research and projects and agreed to continue discussing a number of research areas on the presented topics. At the end of the seminar, all participants will receive certificates prepared by Aachen University. Besides, the parties defined other joint activities for the nearest future: thus, colleagues from Aachen University will take part in the [International Conference on Cyber-Physical Systems and Controls](#), which the Polytechnic University is holding jointly with Leibniz University of Hanover (Germany) and City, University of London (UK) at the end of June.

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