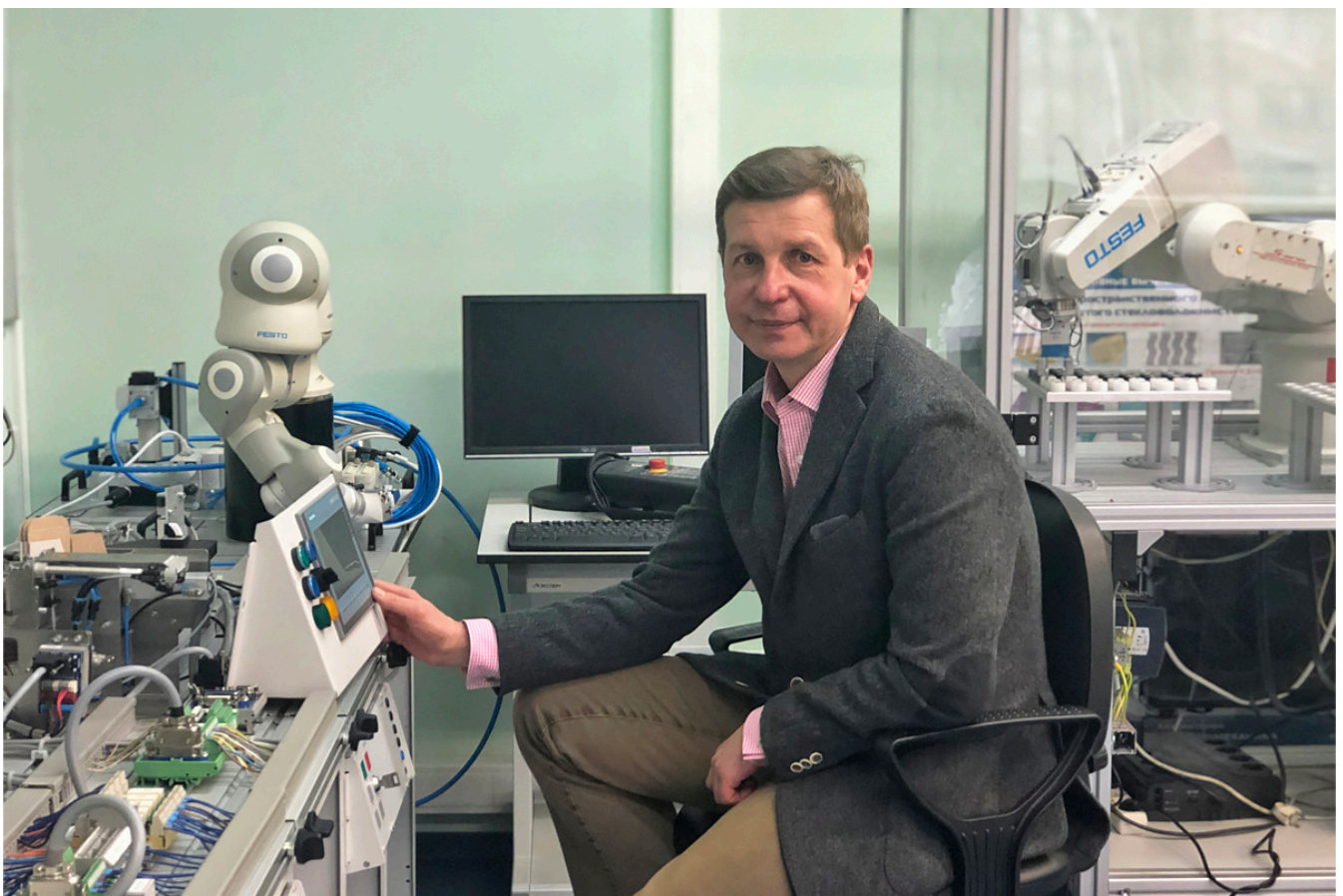# The head of the IT department of the International Polytechnic Winter School talked about the key trends in the programs

 In 2021, the [International Polytechnic Winter School](#) focuses heavily on the topic of information technology. Nearly 60 international students are enrolled in programs devoted to big data, machine learning, and cyber-physical systems. We met with Vyacheslav POTEKHIN, the head of the IT section of the International Polytechnic Winter School, associate professor of the Higher School of Cyber-physical Systems and Control, director of the SPbPU-FESTO MSC to find out what skills students need to have to participate in the programs, how the practical training takes place and what projects participants work on, what they will become familiar with after training and what professions they can master in the future. Read about this and more in our interview.

 - Vyacheslav, how fast is the IT-section developing within the framework of summer and winter schools? What did you start with and what have you come to at the moment?

 - The section is in great demand, and it's developing rapidly. Our trial run was the "Smart Manufacturing and Digital Future" Program. It covered Industry 4.0 quite

extensively, and we began to receive requests to look at its individual components in more detail. So we created educational modules on machine learning, big data, and artificial intelligence.

 - How many educational modules in the field of IT are implemented as part of the International Polytechnic Winter School?

 - This year we launched four programs. First is the educational module ["Machine Learning: Theory and Application"](). Its introductory part was the ["Artificial Intelligence for Everyone"](), which took place in the fall of 2020. Second is the ["Big Data: Theory and Application"]() module, which was launched for the first time this year. And finally, the ["Cyber-Physical Systems and Technologies"]() program. It is one of the most numerous - 27 students from China study in it. They joined the International Polytechnic Winter School thanks to the activities of the official representative office of SPbPU in Shanghai.

 - What basic knowledge and skills do students need to have in order to participate in the programs?

 - It is highly desirable that students have a basic knowledge of mathematics and physics, so that they are closer to technical fields. Programming experience would be a significant advantage.

 - Why did Polytechnic University decide to implement the IT section within the framework of winter and summer schools? Did you take into account the experience of your foreign colleagues?

 - We are based on the knowledge that is required of students by potential employers - leading Russian and foreign companies. And, of course, we are in touch with our foreign partners; we regularly share successful practices and knowledge with each other and run joint programs. For example, Polytechnic University implements the "Cyberphysical Systems and Technologies" course with its partner from Germany, [Aachen University](). Our colleagues, [Aleksandra MÜLLER]() and Minh TRIN give lectures on promising directions in production processes.

 - Was recruiting difficult during the pandemic?

 - Surprisingly, during the pandemic the number of requests from international students increased. We tried to adapt the face-to-face format as much as possible into a distance learning format. A significant part of the students' educational activities is still taken up by internships.

- Can you tell us more about how the practical classes are held?

- Practical classes are organized at SPbPU on a high level. Participants have access to Polytechnic University equipment. More than 50% of the time students work with software products and complete complex projects. There are no significant problems with forming work groups and allocating roles in teams - we have long since worked everything out, this is a well-established process. In particular, we try to form teams in such a way that they include students with different backgrounds, so that they complement each other within their teams.

- What will students learn to do as a result of the programs?

- First, they can use what they learn to further their education. Secondly, they will be able to apply that in their future profession. The areas we work with are new and promising. This is our future, where automation and robotization processes will be implemented everywhere. Participants of the International Polytechnic Winter School acquire comprehensive knowledge and skills, as well as valuable experience of teamwork on a specific project. All in all, students master a good semester-long course in two weeks of the program - it is so eventful and intense.

- Can you give examples of professions that students will be able to master in the future?

- The range is quite large – it's an analyst, interface developer, control system developer, intelligent control system developer. In other words, these are practically all professions that will oversee production processes.

 - Are you planning any changes for programs in future seasons?

 - We don't stand still, and we incorporate innovations into our programs as they become available. Here's an example from the field of programming languages. In the middle of last year, a new standard appeared. This had an immediate impact on the content of our courses - we made changes to both our software products and the teaching process. In addition, every year, students work on new projects - we choose them according to current trends.

 - Thank you for the interesting interview! We wish you successful programs and motivated students!

<div align="right">Prepared by the SPbPU International Office</div>

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