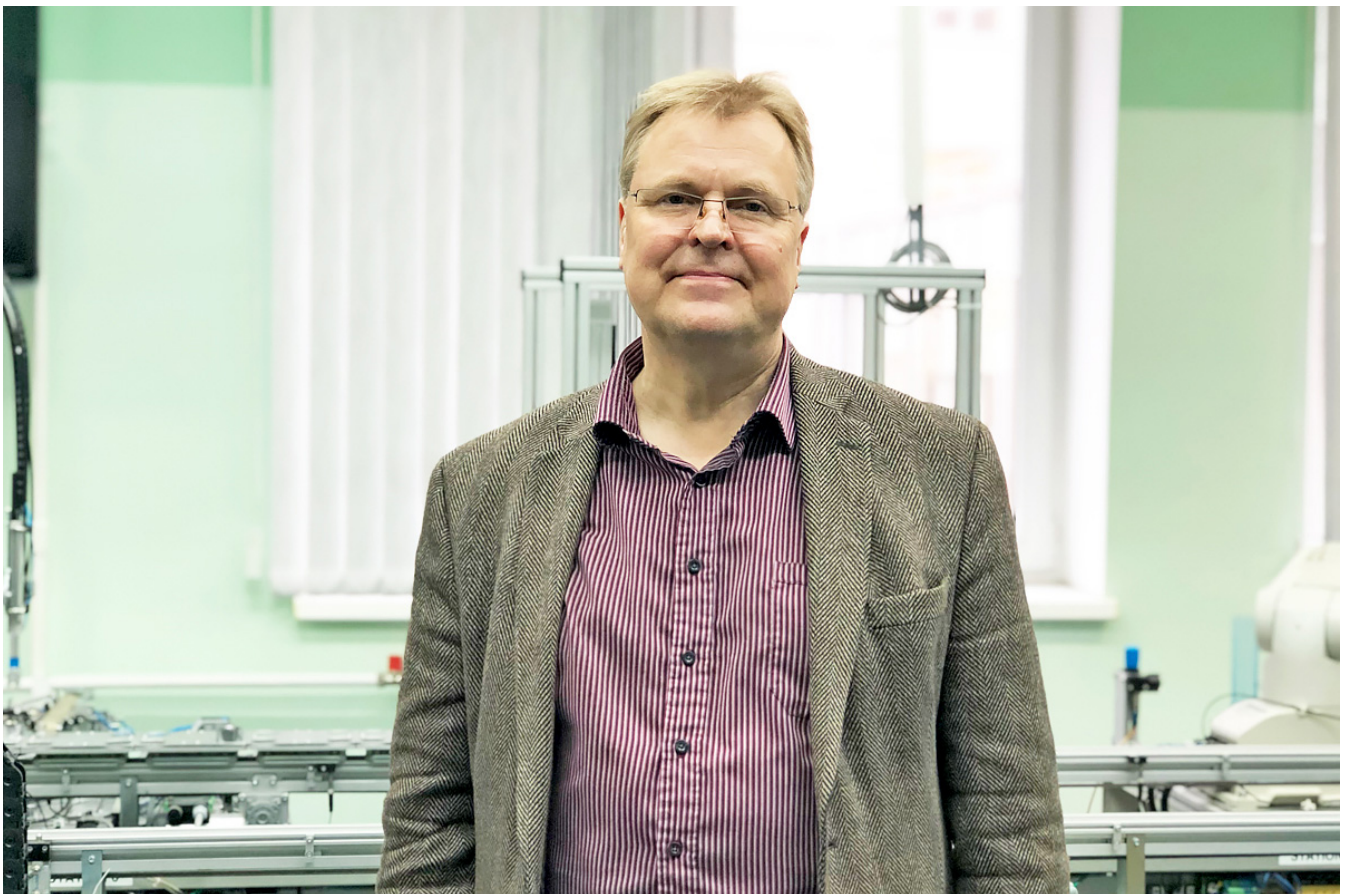


## Professor Heikki KÄLVIÄINEN: about Computer Vision, Successful Graduates and Sought-After Professions

Professor at Lappeenranta-Lahti University of Technology (Finland) Heikki KÄLVIÄINEN is a long-term friend of Polytechnic University. In 2020, Professor KÄLVIÄINEN took part in the International Polytechnic Winter School, and led a course on computer vision, analysis and image processing for the students of the [Smart Manufacturing and Digital Future](#) module. During the breaks between lectures, he gave an interview to the international services of SPbPU, in which he spoke about the digitalization and machine vision, described where graduates of the joint SPbPU and LUT [Intelligent Systems](#) program work today, and what skills you need to have to master one of the most sought-after professions of the 21st century.

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**- Professor KÄLVIÄINEN, glad to see you again at Polytechnic University! What are your impressions of the students you work with this year?**

- The impressions are fantastic! It is very pleasant to work with students: despite

the fact that the material is quite complex, they grab it on the fly. They also ask a lot of clarifying questions on the topic of the lesson - from digital image processing to neural networks.

**- What is your course about?**

- My course is dedicated to digitalization: working with digital images, computer vision, and pattern recognition. All this has wide practical application, for example, medical imaging or industrial imaging. The latter is also called machine vision. Thanks to it, we can optimize and automate the monitoring of many production processes. Machine vision systems solve a lot of problems: measure the dimensions of objects, calculate their number or weight. And, most importantly, they provide a stable and objective result.

**- The course is, in fact, difficult. Is it easy to convey material to a foreign audience?**

- My main audience consists of foreign students. Many of them, by the way, are from Russia. For example, now I have two Russian postgraduate students and three graduates. This is not the first time that I come to Polytechnic University, and have already worked with your students. But this course is the longest of the ones I have taught here.



**- We know that you are one of the initiators of the creation of a joint international program of SPbPU and LUT. Could you tell more about it?**

We started working in the double-degree program in [Intelligent Systems](#) about 20 years ago. I can tell you more: together with your university, we created one of the first international IT programs in Finland. Today, we conduct training at the intersection of computer and engineering sciences; we pay great attention to the practical component. Graduates of the program become experts in the field of big data, the use of neural networks and deep learning technologies for large volumes of data.

**- And where do the graduates of the program work?**

- They have lots of options, from science to production. Most of those who go to the industry hold the positions of leading managers or executives. Some work at large IT companies, such as Facebook, for example. And some have established their own companies. Those who chose the scientific area, defend dissertations, teach at universities and conduct research.

Companies' CEOs are very pleased when we send students to undergo practical training with them; often after graduation, the guys return to them as employees. I think this is great: as a student you get a project from the real world, and continue to work on it in the status of a company's expert.

**- What skills you must have in order to join this program?**

- First of all, these are programming skills. This is a prerequisite. Secondly, it is, of course, mathematics. A major advantage will be knowledge of basic computer science.

**- Don't you think that there is an oversupply of programmers on the market now?**

- If we are talking about the market for programmers, then this is true. But in our specific area, we presently have a large shortage of specialists. If you want to find an expert who understands neural networks, deep learning methods, machine-learning and related fields - you know, such people are always in demand, and they are hunted for. There is a shortage of such specialists even in Finland.

**- Professor KÄLVIÄINEN, and finally, our traditional question: what would you wish students to achieve success in their studies and in life?**

- You should be open to new things, abandon prejudices, seize chances and opportunities, and leave the comfort zone. Keep in touch with the international community. Be able to work at the intersection of science and related disciplines. And in general - be able to work with people, to be partners. All these are your helpers on the path to success.

**- Professor KÄLVIÄINEN, thank you for the interesting interview! We wish**

**you good luck and creative achievements!**

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