Translated content of a part of the Slovak Television program VAT = Veda a Technika (Science and Technology), broadcasted by Channel No. 2 (STV2) on December 22, 2014, 20:55

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(STV2, 2014 / translated by Ales Janota, DCIS)

Text on the video archive web page:

Moderator's introductory speech [00:00 – 00:43 min]:

Good evening with the VAT magazine on Channel 2. Today we'll print the first artificial vertebra using a 3D printer, we'll show you a very innovative farm growing vegetables in a dark room without windows, we'll introduce to you displays of the future that can adapt to your eyes, you will find out for what spider's genes could be used and we'll show you the oldest overland plant in the world.

In Slovakia we have found the latest technologies at the University of Zilina. We'll introduce a family of miniature robots to you. So enjoy your watching.

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Presentation in the robotic laboratory of the Department [07:57 – 15:03 min]

(Moderator):

In the VAT program we have already introduced various kinds of robots, various kinds from various countries. Today we have come to the University of Zilina, to introduce a mini-robot e-Puck.

(Ing. Vojtech Simak, PhD – head of laboratory, DCIS):

Well, it is really a miniature robot since its dimensions being in-between 1 up to 10 cm really qualify it into the category of miniature robots; its particular construction size is 7 cm in diameter. Apart from miniature robots there are also so-called micro-robots and nano-robots that are much smaller which is not this case.

Within introduction I mentioned the name e-Puck. What does it mean?

e-Puck is a robot developed at the Swiss Federal Institute of Technology in Lausanne. It is a robot whose name was inspired by the hockey puck because its dimensions really suggest its shape (unlike the height which is double). Such dimensions have been chosen because of attractive design and easy simulation.

At first sight this wonder suggests me a child's sophisticated toy. Is it really a trend of development in the 21st century? The robot of the 21st century?

Yes, its appearance results from the trend of gradual miniaturization. That's why it has such small compact dimensions but development and extension of this robot is shared by the wide community around the world.

And what technologies is it equipped with?

This robot is equipped with the 32-bit processor, proximity approach sensors, sensor of line in the bottom, three microphones, loudspeaker, accelerometer for acceleration measurement and Bluetooth interface.

I must say I have not understood all you were talking about. Will you explain what can this robot do?

Primarily this robot was intended for educational purposes – as a pedagogical aid for teaching process. However, at present it is involved in a lot of research projects. For example, camera-based following of a certain objects if we talk about behaviour on one robot only; following the line; reaction to sounds coming from the environment, reaction to shock, to approach, etc.

Does it mean we can program it to prevent collision with an obstacle or to force it to follow the black circle? What else?

Yes, exactly. In case we have a group of them as in this case they are able to simulate behaviour of e.g. a robotic swarm. We talk about the robotic swarm if one individual is not able to fulfil the task but more robots can do.

For what kind of research do you use the robotic swarm?

We use them e.g. to investigate behaviour (algorithms - note) of robot in case of catastrophic events, for searching through a certain space, to simulate automatically guided vehicle in production halls…

Does it mean that the robots cooperate?

Yes, they can communicate one with each other via wireless Bluetooth interface.

As far as the use in production halls is concerned, how are such robots used there?

In industrial factories the robots are operated in various ways, for example: waiting for material to be loaded, confirmation of loading termination, then the robot independently moves to another part of factory to deliver the loaded material. That is function of automatic guided vehicles.

That is function of one robot, But if you have multiple robots…

One robot is not able to supply the whole factory. So using this group of robots we are able to simulate their behaviour in one common space, for example to avoid their mutual collisions. Another example could be an application in the road transport: crossing an intersection when a vehicle having the right of preference movement is approaching. How to ensure its safe passing the intersection?

Does it mean we already talk about sophisticated cars capable of self-moving?

Yes, deployment of such systems into modern cars is under investigation, they could automatically give precedence to vehicles of emergency rescue, police, etc.

You have mentioned the robot originates from Switzerland, 2006. Have you improved it anyhow since you have had it here?

This robot, or more precisely a set of 10 robots, have been obtained during the last summer holiday time so there has not been too much time to work with that but in future we plan to extend functionality of this robot using its buses for additional sensors such as gyroscope, magnetic compass, sensors and actuators making possible to play the robotic football, and other applications.

So the future of these robots here at the university will be…?

… will be especially in the education process, i.e. teaching within the course in Robotic systems in the spring semester, and another use in elaboration of qualification works (bachelor, master, PhD theses) as a realization tool.

We were talking about the use in industry. What about the use for common people, a common person? Can you imagine it?

Yes, I can. This robot has similar sensors and actuators as the robotic vacuum cleaners have, they are normally sold to our households. In case you have more such robotic cleaners, these robots may be used to simulate their behaviour (avoidance of collisions etc.).

Could we use it for example in health-care for elderly or disabled people?

Surely. These robots could be used to bring food, medicine and so on, to monitor a human conditions - something wrong may happen at home...

Thank you very much for information about these mini robots... May I take it? And together with this small puck we'd like to say goodbye. Wishing you all the best. Thank you.

***Text (end titles)*:**

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