Description of the specialization

I. DESIGN AND OPTIMISATION OF PROCESSES

1. Smart security systems for automated systems and robots
2. Designing the advanced human-machine, human-system, machine-machine, and system-system interfaces.
3. Virtual prototyping of solutions in process automation and robotics of processes.
4. Development and design of IT solutions for data collection and analysis to support production processes, including systems based on artificial intelligence, expert systems, extensive inference systems, systems based on computer simulations of various levels of complexity, multi-agent systems.
5. Optimisation systems for auxiliary processes of automated and robotised processes.
6. Designing, optimisation, automation, robotisation of production processes.

II. PROCESS AUTOMATION AND ROBOTISATION TECHNOLOGIES

1. Technologies of intelligent control of devices and machines as well as robots in production systems.
2. Mobile technologies in devices, machines, robots, as well as manufacturing and logistic processes.
3. Sensor techniques, drives, power supply in processes, machines, devices, and robots.
4. Production and assembly technologies in outer space conditions.
5. Methods, tools, instrumentation, materials and processes related to incremental technology.

III. DIAGNOSTICS AND MONITORING

1. Advanced diagnostics and monitoring systems designed for processes, machines, devices, robots and their systems using artificial intelligence methods and techniques, expert systems.
2. Smart systems for measurement and quality control, including those designed for processes and products of manufacturing systems.

IV. CONTROL SYSTEMS

1. Innovative control systems for machines and devices, robots, and innovative distributed and/or multi-agent systems improving the efficiency of manufacturing processes, including those resistant to interferences and errors occurring during

autonomous operation of machines and devices.
2. Computational software and systems for simulation, modelling and optimisation of control systems.
3. Control systems for robots, vehicles and other mobile devices, including the unmanned ones.
4. Vision and tomography systems in automation and robotics.

V. MACHINES AND DEVICES FOR AUTOMATION AND ROBOTIZATION OF PROCESSES

1. Unmanned systems and robots operating in special conditions.
2. Mobile robots and exoskeletons.
3. Manipulators and grippers