**Technical specialty of Institute of Information Technology:**

<table>
<thead>
<tr>
<th>The Institute offers education in the following fields of study:</th>
<th>Education and research activities:</th>
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<td><strong>In Polish:</strong></td>
<td>The programme serves as the knowledge base for the complex and extensive field of information technologies. It concerns studies of algorithms and limits of computation in the context of the practical issues of implementing computing systems in hardware and software.</td>
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<tr>
<td>· Computer Graphics and Multimedia</td>
<td>Research topics are concerned with the theory and practice of computer science and innovative computer technology, as well as their application in engineering, biomedicine, ecology, socioeconomics and education.</td>
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<tr>
<td>· Computer Networks and Teleinformation Systems</td>
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<tr>
<td>· Computer Simulation and Games Technology</td>
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<tr>
<td>· Information Systems and Data Bases</td>
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<tr>
<td>· Information Technologies in Telecommunication</td>
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<tr>
<td>· Software Engineering and Data Analysis</td>
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<td><strong>In English:</strong></td>
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<tr>
<td>· Science and Technology - the study programme in cooperation with IFE (International Faculty of Engineering)</td>
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<td>· Information Technology - also in cooperation with IFE.</td>
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**Background and some sample projects**

**Background:**

Deploying real-time control systems using

- embedded computers
- NXT Mindstorm

**Applying general control algorithms to network entities or traffic control**

**Sample projects:**

1. Identification of optimal parameters for TCP (Transport Control Protocol) & RED (Random Early Detection) algorithms working together (using Matlab)
2. (requires assembly)
   a. Designing & implementing the helicopter model using microcontroller based systems
   b. Designing & implementing the helicopter model using NXT Mindstorm
   c. Designing & implementing the inverted pendulum model using microcontroller based systems
   d. Designing & implementing the inverted pendulum model using NXT Mindstorm
   e. Designing & implementing the loading bridge model using NXT Mindstorm
3. Designing & implementing of control objects using ZigBee networks
4. Designing & implementing of control objects using Bluetooth networks
5. The lab stand for developing control algorithms for systems with variable latencies
6. An identification of traffic parameters of 802.15.4 capable devices applied to VANET (Vehicle Area NETworks)
7. Exploiting the uPnP (Universal Plug & Play) devices in control systems

Prerequisites:
- Programming in high level languages
- Network engineering
- Introductory course for computer controlled systems

Background:
Computer Graphics for visualization of Mechatronics phenomena
- Visualization
- Software modeling and design

Sample projects:
1. Complex simulation models and sophisticated animations
2. Visualization in the biomedical systems
3. Multimedia techniques in mechatronic systems
4. Management and analysis of the physical objects’ motion

Prerequisites:
- Programming in high level languages

[NOTE: The subjects above are suggestions from only two fields pursued at the institute. Topics may also include subjects from the other five specialisms listed in the first section.]

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