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Robots in Our Life

Robots have become a part of our life. They fly to the space exploring other planets, help to do some work for military purposes – demine bombs and scout a situation from the air. It is hard to imagine many areas of industry without robots: they collect cars, help find new medicines and so on.

But today, the consumer robotics market is still fragmented. Different manufacturers make different and incompatible hardware. Every time technologies and tools are created to find solution to a specific problem, they are almost impossible to reuse. The area is very difficult and requires high efficient staff. At the same time, there is another factor: there is no transfer of knowledge and experience between different regions. Being concerned with this problem, Microsoft has offered a solution – Microsoft Robotics Studio (MSRS) aimed at programmers of different levels. It includes four basic components:

1. CCR (Concurrency and Coordination Runtime)
2. DSS (DecentralizedSoftwareServices)
3. VPL (Visual Programming Language)
4. VSE (Visual SimulationEnvironment)

Concurrency and Coordination Runtime is a library for working with parallel and asynchronous data streams is based on the .NET Framework. Interacting with the environment robots need to properly respond to the information that comes from a variety of sensors. Therefore, it was decided to transfer a substantial part of logics onto a computer which may be separate from the robot. The result of this was development of the CCR library-site, which makes it easy to create the code for parallel execution.

Decentralized Software Services is a lightweight framework for creating distributed applications based on CCR which provides a variety of management services to correct behavior.

Visual Programming Language was developed by Microsoft specifically for Microsoft Robotics Developer Studio. VPL is designed for beginners who know the basic principles, such as algorithms and variables. VPL generally describes some of the robot modules and their relationship to each other. Robot modules can be a variety of sensors (distance, touching, light, etc.), webcams, GPS-navigation devices, motors and actuators, speakers, LEDs, various indicators, displays and others. In addition, these modules in the Robotic Studio may make special dialogue windows, for example, manual robot remote control one.

Visual Simulation Environment is a simulation environment. It helps to simulate the behavior of robots in virtual environment. The presence of a robot is not necessary. A simulation environment is a graphical 3D-model mapping the actions of robots and objects surrounding them. Physical aspects of this are so deeply thought out that even coups modeling robots or robots separation from the ground and collision of objects become possible. To ensure realism in the virtual, NVIDIA PhysX technology is used.

Microsoft Robotics Studio is ideal for exploring robots and programming techniques. To do this, there are cheap, easy to use and program robots. In spite of this fact, they are quite feature-rich. A good example is iRobot Create and Lego NXT.

We consider Microsoft idea to create a dedicated development environment for robots a great one. In the future, it will simplify the task to create projects to many fans of robotics.