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STEM robotics made easy: An easy way for students to program robots**Boian Mitov**

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Robotics is becoming increasingly important part of the STEM education. With the increased availability of cheap arduino controllers, sensor modules, actuators and entire robot kits, the students are able to quickly learn how to build robots and connect the electronic components. Most students however struggle with programming the micro-controllers due to the complexity of the available programming tools and the tools general unsuitability for easily processing simultaneous tasks. Software development is considerably different than designing and connecting hardware, requiring a complete paradigm shift in understanding of how everything works. A new approach to programming robots in STEM classes is to solve a problem, a new graphical data-flow and event driven programming approach to micro-controller and robot programming has been developed and easy to use graphical development environment called visuino has been introduced. The data-flow and event driven approach makes programming very similar to the way kids connect sensor modules and actuators to the micro-controller. In visuino the typical hardware modules such servos, stepper motors are represented by corresponding software graphical representations, making it easy to understand how the hardware will be controlled. Once the graphical design is completed by pressing a button visuino generates ready to compile and upload C++ code, making it very quick and easy to create complex robot projects in very short time.

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