Open Roberta Lab - Visual Online Programming Environment for Computer Kids

Markus Ketterl, Beate Jost, Thorsten Leimbach, Reinhard Budde, Kostadin Cvejoski, Daniel Pyka and Dieter Strecker

Fraunhofer IAIS
Schloß Birlinghoven
53757 Sankt Augustin
Germany

The Google funded Open Roberta[1] project continuous the Fraunhofer IAIS initiative "Roberta - Learning with Robots". Roberta[2] aims at engaging and motivating girls and boys to take a sustained long-term interest in information technology, technology and the natural sciences (STEM). For more than ten years, this underlying initiative successfully enabled girls and boys to explore the world of robots and to learn about computer science and technology in a playful way. With more than 30.000 participating children and young people in over 600 documented Roberta courses a year - Roberta has become a permanent fixture in the German education landscape.

The aim of Open Roberta is to overcome technical and professional barriers for teachers and students alike at home or in the classrooms. The free to use cloud-based Open Roberta Lab consists of graphical programming tools that enable beginners to seamlessly start coding without long-winded system installations, setups or additional technology getting in the way.

In its first available release, Open Roberta enables children and adolescents to program LEGO Mindstorms EV3 robots in the beginning. A variety of different visual programming blocks are provided to interact with motors,

---

[1]http://www.open-roberta.org

[2]http://roberta-home.de

sensors and the core of LEGO robots, the EV3-Brick. Upcoming software releases are aiming at a broader online programming support for additional educational hardware (like robots, toys, etc.). The necessary machine code translations are part of our new invented NEPO® programming language which is build into Open Roberta.

The created technology and its concepts are free to use for anyone and are available as open source. In a first step, the development team at the Fraunhofer Institute for Intelligent Analysis and Information Systems reached out to teachers, IT and education experts within the partnering Roberta network as well as to universities and their students to involve them in the development work. In the ongoing second step, the open-source community has been opened to all interested parties and programmers. By doing that Roberta still follows its main mission namely the encouragement of female newbies in order to help them becoming role models for the next generation of programming experts.

The presentation will address current limitations of available classroom programming solutions and is going to showcase Open Robertas online coding capabilities. A further aspect of the talk will be the introduction of the NEPO® abstraction language as a core concept for upcoming hardware communication.