Constructionism Applied

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Abstract

Efforts within the constructionism concentrate around the platform used by the original author of the idea, Seymour Papert. Papert was working with LEGO educational division on what later became a known product LEGO Dacta, programmable in a parallel Logo-like language with commands to control the motors and sensors of a model connected through a wired interface. The current educational projects of LEGO are a follow-up of this good start, even though usually not using Logo language. Some efforts to compensate this include [1,2]. LEGO sets, however, always remain at the level of toy construction sets, and toy models. We argue, that the real constructionism starts where the LEGO ends, and we call it *constructionism applied*. This poster summarizes our applied constructionism experience, working with children of different age level.

FIRST LEGO League (FLL) – not only LEGO

Contests are a far greatest motivation for young people attending our robotics clubs (whether 10 year olds or 14-16 or 17+). In our region, four different contests are targeted at young people: FLL, RoboCup Junior, RobotChallenge, and Istrobot. In FLL, in addition to building a LEGO model, children work on a research project, put together their own creative idea, support it by their own designs, prepare, and show a presentation. Some of them show a deep excitement. For instance, the teams construct a model of an airship, show a little play to demonstrate and explain their idea.

Figure.1. Boat robot for Istrobot contest. Capable of navigating 100s of meters across a lake using compass sensor.

RoboCup Junior(RCJ) – category Soccer

The main RCJ category – robotic football/soccer is the core contest discipline, and LEGO robots are an excellent start. Using advanced LEGO IR seeker and compass sensors, children can put together a working robot in couple of hours. The real experience starts when they try to build their own robot. Two students from our club, have been building their robot for two years: they were able to design a 3D model of their robot using CAD software, have the parts cut using waterjet, design complex navigational strategies using omni-directional wheels, program specialized microcontroller boards with cameras and simple image-processing capabilities.

RCJ Slovakia – category Construction. Unlike the usual RCJ categories, and most of the other contests, where the task is (almost) the same every year, we maintain a traditional category labeled "Construction". Here, the students learn the task only at the contest and spend several hours building and programming their robots to solve it. There are many advantages to this approach: the students can join the contest without any preconditions, they do not need to block the club's equipment for many weeks before the contest, and they show their real skills, as contrasted to skills of their team leader.

References

[1] Petrovic, P. (2007) Program Your NXT Robot with Imagine, Eurologo 2007.

[2] MicroWorlds Ex, Robotics Ed., LCSI, at: www.microworlds.com/solutions/mwexrobotics.html.