Review: Lego Mindstorms NXT Kit

Op-Ed: What can engineers learn about electronics product design from Lego's [1] Mindstorms NXT [2] kit? Abstract thinking, control, diligence, efficiency, low parts count, planning, and more. And last but not least, it's just a whole lot of fun [3] to build robotic Lego contraptions [4].
My own Lego experiences began in the late 1970s. By the mid-to-late 1980s I moved on to the "Expert Builder" series (now called the "Technic [5]" series, which would be a great fit for Mindstormsization themselves); the experience introduced me to the joys of mechanical engineering. The gears, mechanical assemblies, and pneumatics were far more advanced that other toys, even compared to Erector [6] sets. Meanwhile I already knew about computer programming, learning LOGO and then BASIC as early as grade school. Yet there was no way to combine these hobbies, so I moved elsewhere and stumbled into radio-controlled models.

What if there were a converged technology back then? Perhaps I would have become an engineer instead of just taking an industrial design minor in college. (Not that I regret becoming a writer!)

Today's youth have it better: they can learn from Mindstorms, which combines Bluetooth, microcontrollers, programming, and good old Lego-playing into one. The Lego Group sent me a full Mindstorms kit a few weeks ago to evaluate. My evaluation: I'd beg for this kit in a heartbeat, if only I were a child again. But child, schmild! We adults can get just as much enjoyment from this "toy" as our younger techie peers.

I built the demonstration robot [7], installed the graphical development software [8], connected the USB wire, and immediately started programming. Within minutes the robot began scampering across the floor, backing up, turning, and making if-then decisions by using its various sensors. Which leads to my only criticism: compiling, downloading, and executing programs between the software and the 32-bit microcontroller takes too long. Lego needs either a more efficient compiler, a bigger bandwidth connection type, or a faster microcontroller. My simple impatience will be utter frustration for most children.

If I had more time, I would have built the "RoboArm T-56 [9]" model – whereas the robotic insect and robotic humanoids look cool, but hey, this is still *ECN*, where technology manufacturing is among our fetishes. It also would be fun to build some real industrial robots, and to use aftermarket sensors such as Dataport Systems' HiTechnic [10] series. For those readers who do have time on their hands, I highly recommend visiting some Mindstorms enthusiast sites like the Lego Message Board [11], Lugnet's resources page [12], Nextlog [13], and Nxtasy [14]. (If you know of other useful Mindstorms NXT online resources, then please email me by using the link below.)

Update: When writing this article, I posted on two engineering forums, looking for

public feedback of the Mindstorms kit. Responses arrived from EngineeringForum.org [15] *and The Institution of Engineering and Technology* [16]*. Also, be sure to read my colleague Aimee Kalnoskas' editorial* [17] *and the recent FIRST news* [18]*.*

- Evan Koblentz email me [19]

Source URL (retrieved on *05/19/2013 - 8:36pm*):
http://www.ecnmag.com/blogs/2007/04/review-lego-mindstorms-nxt-kit

Links:
[1] http://shop.lego.com/product/?p=8527&LangId=2057&ShipTo=US
[2] http://mindstorms.lego.com/
[3] http://mindstorms.lego.com/Overview/NXTreme.aspx
[4] http://mindstorms.lego.com/botstars/
[5] http://technic.lego.com/en-US/default.aspx
[6] http://www.erectorworld.com/produits/trans_metal.php
[7] http://mindstorms.lego.com/Overview/MTR_Tribot.aspx
[8] http://mindstorms.lego.com/Overview/NXT_Software.aspx
[9] http://mindstorms.lego.com/Overview/MTR_RoboArm.aspx
[10] http://www.hitechnic.com/
[11] http://club.lego.com/messageboards/ShowForum.aspx?ForumID=1042
[12] http://www.lugnet.com/robotics/rcx/
[13] http://mindstorms.lego.com/NXTLOG/default.aspx
[14] http://nxtasy.org/about/
[15] http://www.engineeringforum.org/forum/showthread.php?s=d08209f38b62d2520991b0aa71518717&threadid=1805
[16] http://www.theiet.org/forums/forum/messageview.cfm?catid=5&threadid=16690&enterthread=y
[17] http://www.ecnmag.com/article.aspx?id=438&issue=1&menuid=552
[18] http://www.usfirst.org/community/content.aspx?id=4190
[19] mailto:evan.koblentz@advantagemedia.com