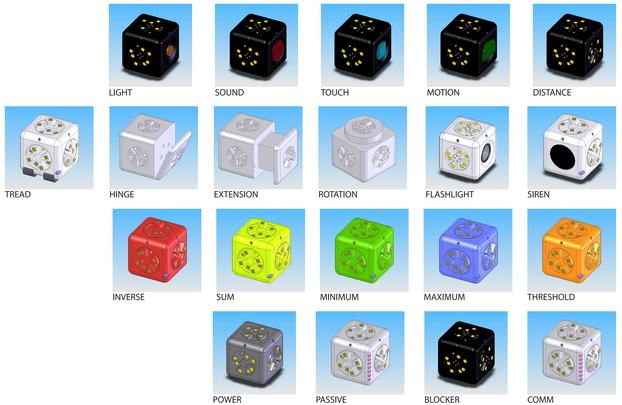

roBlocks

A DISTRIBUTED ROBOTICS CONSTRUCTION KIT

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www.roblocks.org

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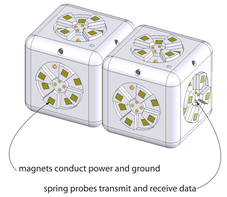
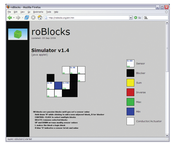
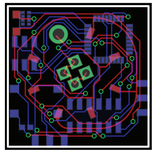
This research was supported in part by the National Science Foundation under Grant ITR-0326054. The views and findings contained in this material are those of the authors and do not necessarily reflect the views of the National Science Foundation.

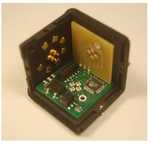




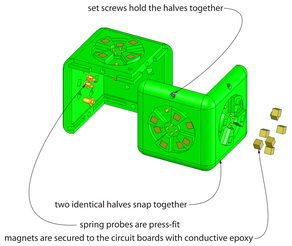
An online simulator applet lets users experiment with constructions and data flow. White blocks transmit data and black blocks block data.

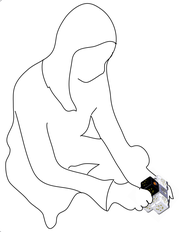


With over 60 SMT pads and 30 vias in a one inch square, the main circuit board is dense.



Each block contains an AVR microcontroller, LEDs, power circuitry, and six printed circuit boards.





Users play with the kit of roBlocks. Simple robots can be created which exhibit a variety of complex behaviors.

Level **1**

A Comm block is added, allowing the construction to communicate with a PC. Users can now view the state of each roBlock, sensor data input, and the network graph.

Level **2**

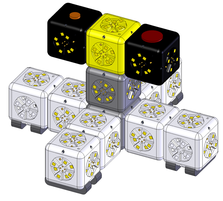
Advanced users can reprogram individual roBlocks using a simple syntax. A sensor block could be reprogrammed to broadcast half of it's value, for example, or blue blocks could be modified to return the product of their inputs.

Level **3**

roBlocks are the basic modules of a computational construction kit created to scaffold learning of math, science and control theory concepts. By combining sensor, logic and actuator blocks, young kids can create simple reconfigurable robots that exhibit surprisingly complex behavior. roBlocks are self-describing, so they can provide helpful feedback to the user, and automatically adjust their functionality based on how they've been assembled. roBlocks are 40mm plastic cubes with magnetic connectors, just pick them up and start building! Using just the blocks, you can create smart robots which sense, plan, and act.

This robot drives forward at a speed corresponding to the amount of light in front of it.

This robot drives forward but stops and turns toward anything that's moving. It turns on its headlight when it's dark.



This robot spins in place at a rate corresponding to the total ambient light and sound in the environment.

LEARNING

roBlocks expose users to a broad range of concepts. In general, we intend roBlocks to encourage children to *think computationally*. Specifically, this means allowing them to experiment with the following concepts:

- Feedback
- Distributed Computing
- Inverse Kinematics
- Digital Logic
- State Machines
- Control Theory