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Computationally Enhanced Construction Kits and Craft

Research Objectives

Develop computationally-enhanced construction kits, focusing on scientific, mathematical, and engineering domains. *Increase educational power and expressiveness* of kits by integrating construction kits with computation.

Approach

Comparative design / build:

- systematically explore design alternatives,
- build & test prototypes
- characterize strengths and weaknesses
- map design space for construction kits & craft

Broader Impact

Construction kits have *an affective role in developing interests* in science and mathematics.

Affordable embedded computation, powerful software, and the Web enable *more democratized and educationally potent* construction kits.

Results (Year One)

First round of prototype kits, including:

- physical cellular automata toys
- computational hub-and-strut geometry kit
- modular robotic building block designs

FlexM hub   Handyboard microprocessor
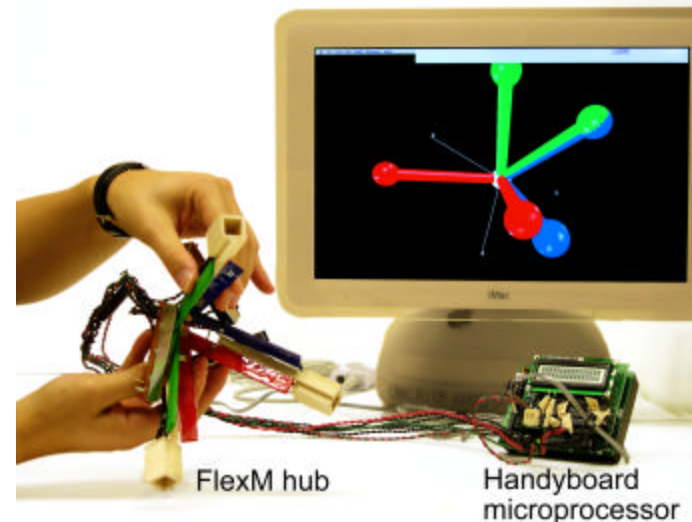
Computational hub-and-strut geometry construction kit—senses and displays model configuration