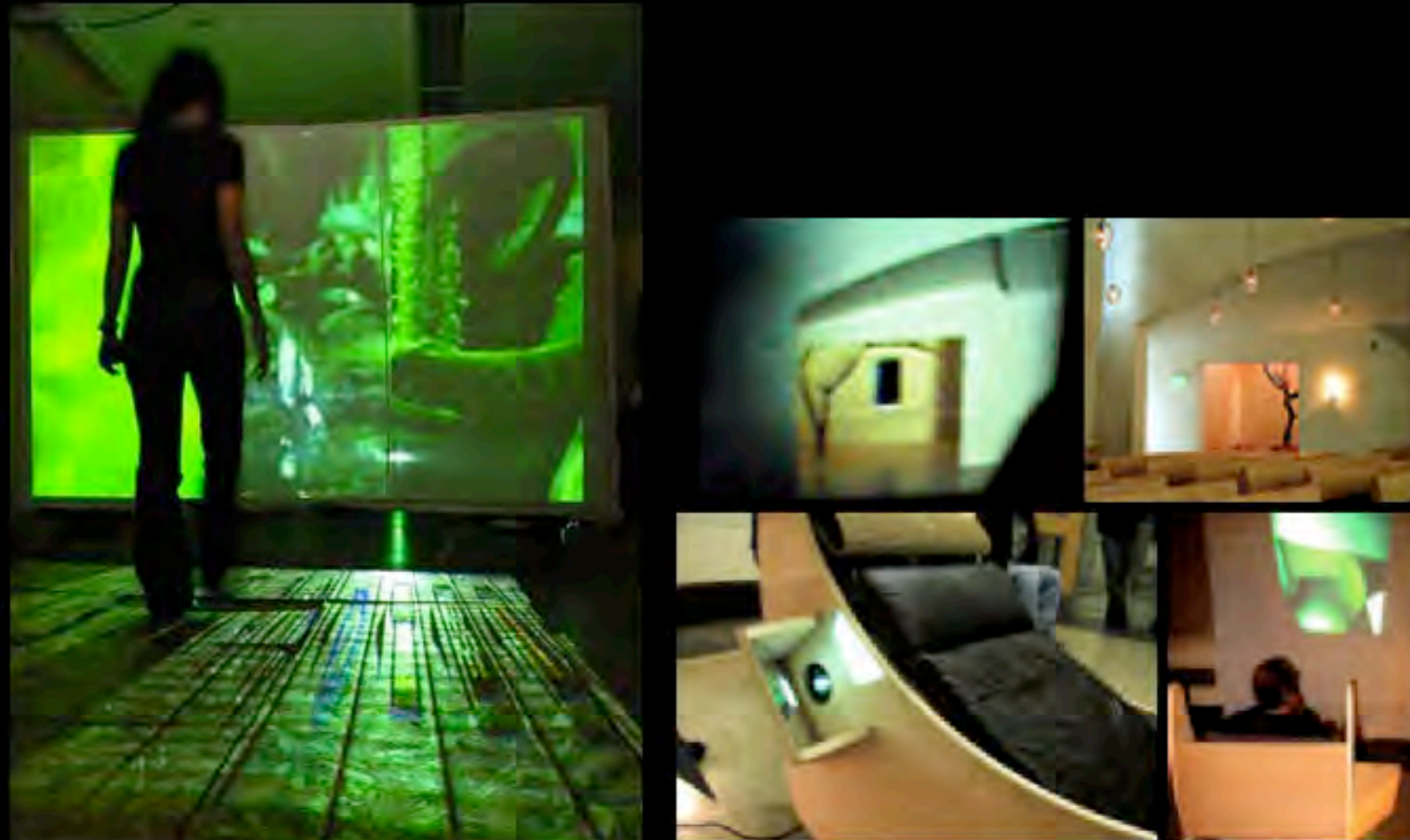


# Home in the Digital Age

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design, computation, and physical environments



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Georgia Institute of Technology**

**[ellendo@cc.gatech.edu](mailto:ellendo@cc.gatech.edu)**

# Computational Design for Home ?!!

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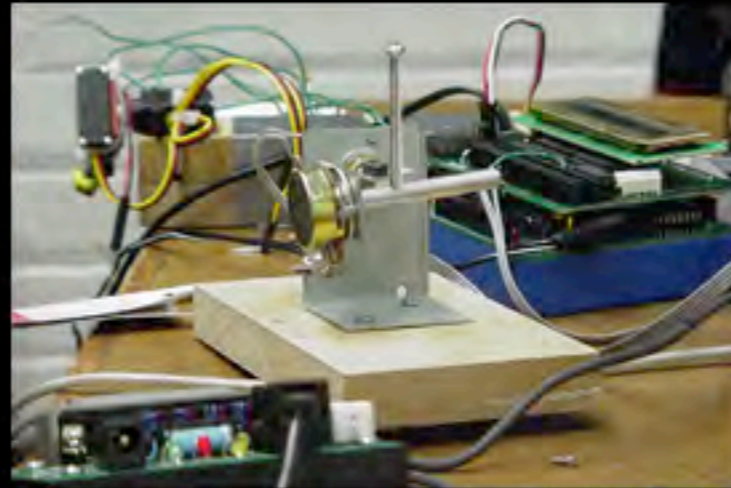
knowing design

knowing computation

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# Sensors and Actuators

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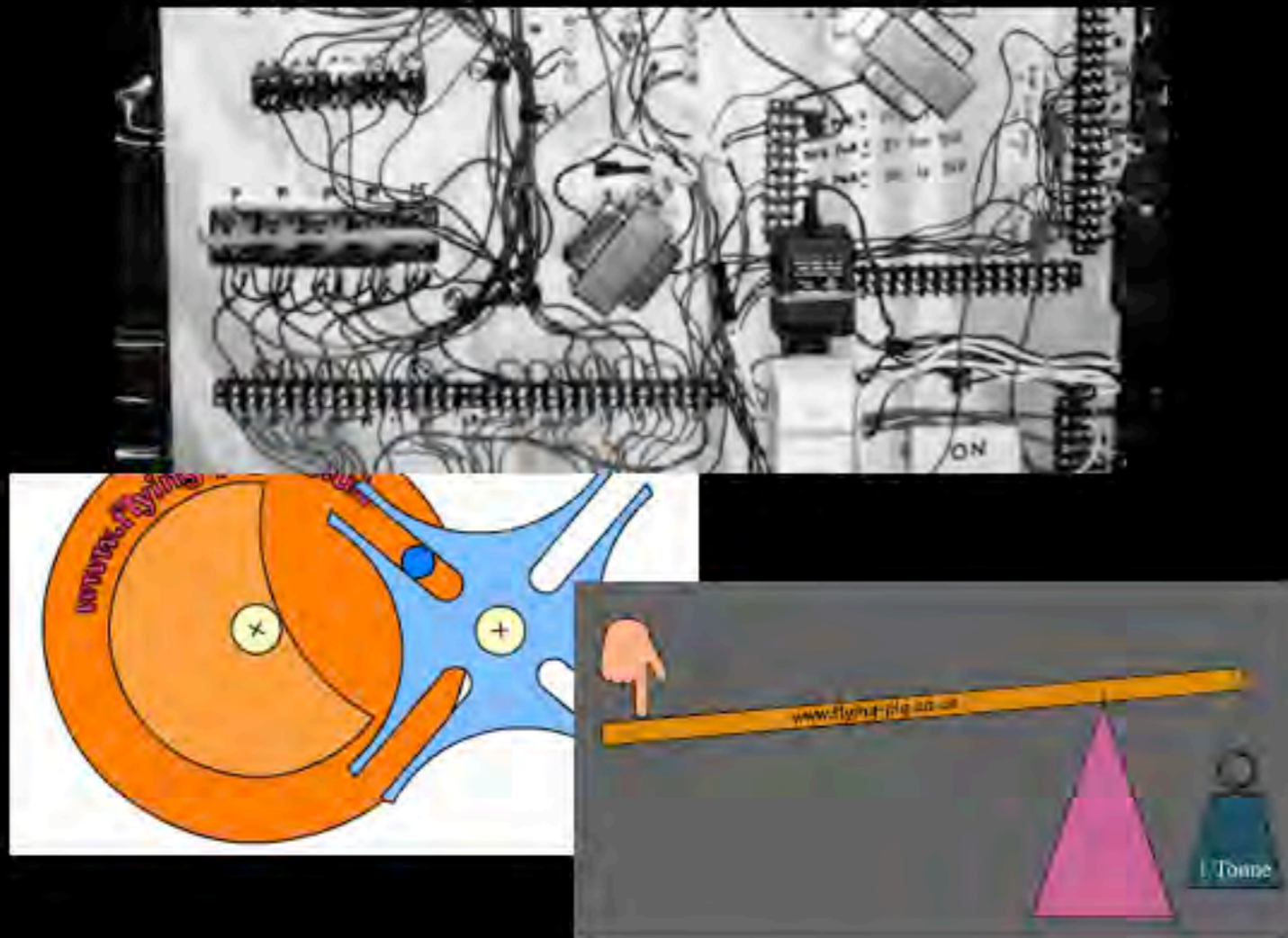


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infrared, sonar, bent, tilt, orientation, light, temperature sensors...  
servo, step, DC motors, circuit relays, muscle wire, electromagnets, etc.

# Electronics and Mechanical Movement

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Ohm's Law, serial vs. parallel resistance and power supply  
Automata, levers, pulleys, gears and cams

# Controllers and Computation

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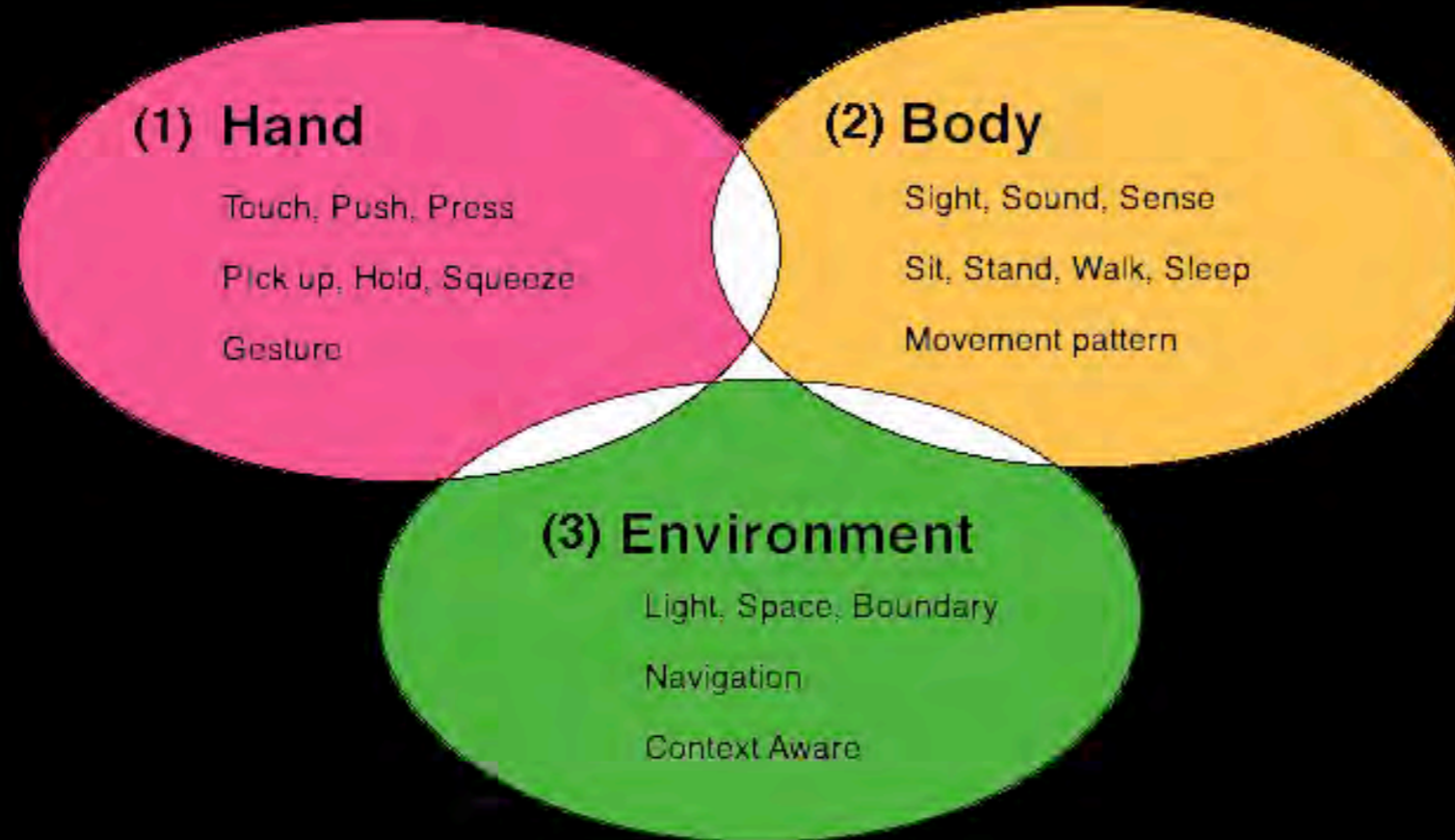
```
int last_position = 0;  
int sensor_value = 0;  
int counter = 0;  
  
int x_motor_speed () {  
  
    return ( ( maze_motor_spe
```

---

Microprocessors: Handyboard, Cricket, Tiny OS, etc.  
Programming language: syntax and debugging environment

# A Human Centric View of Computational Design

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# ■ Hand - Intelligent Objects

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# Digital Finger Painting

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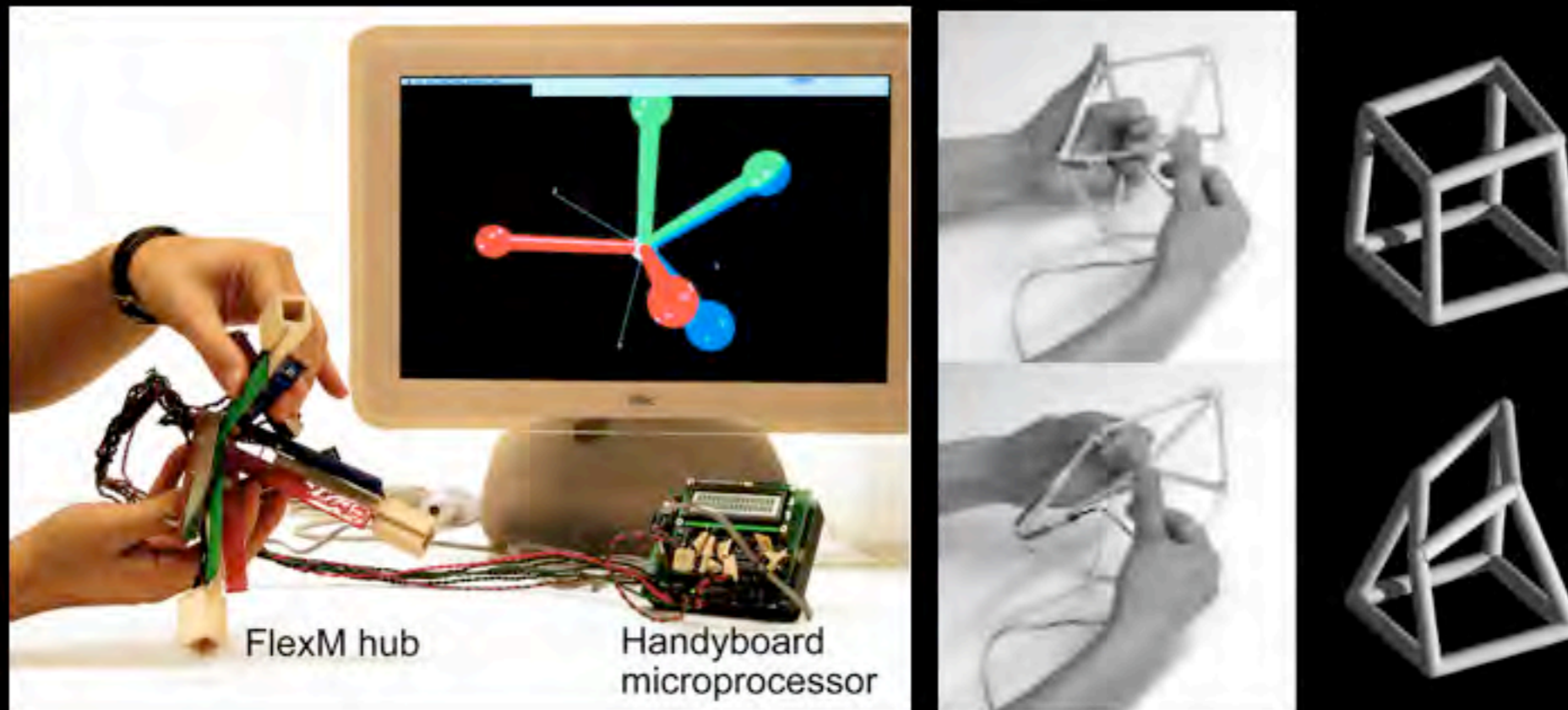


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digital camera, touch screen, image processing, biometric identification

# Flex M

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computational building kits with flexible hubs and struds

# Navigational Blocks

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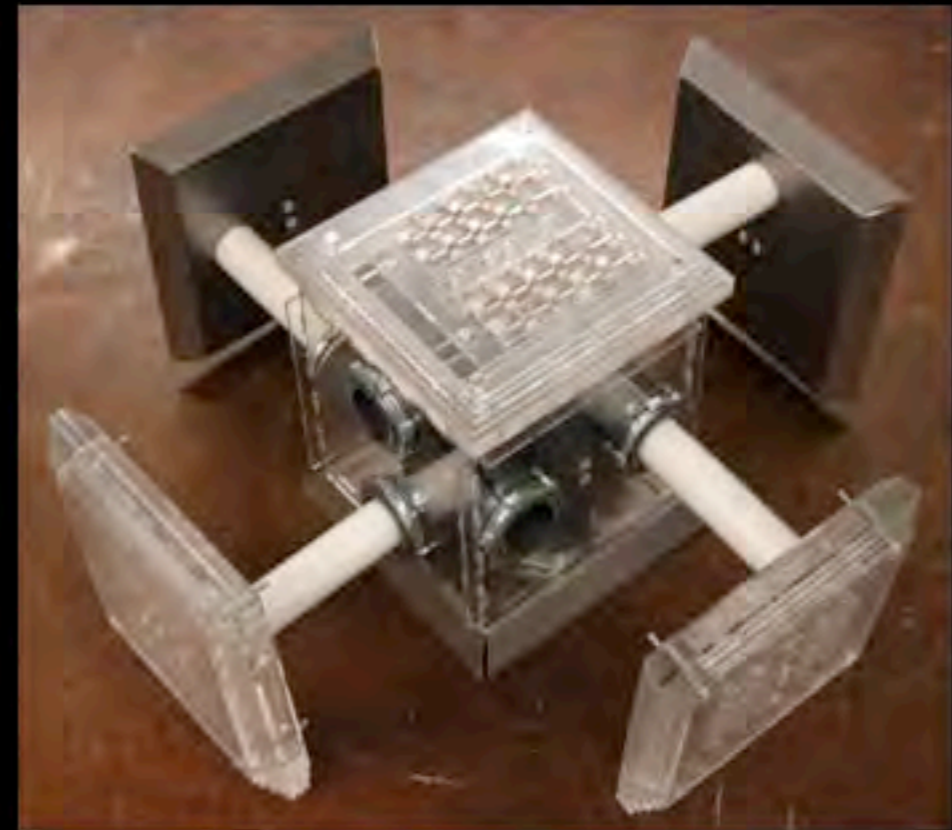


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tangible query interface to multi-media information

# Espresso Blocks

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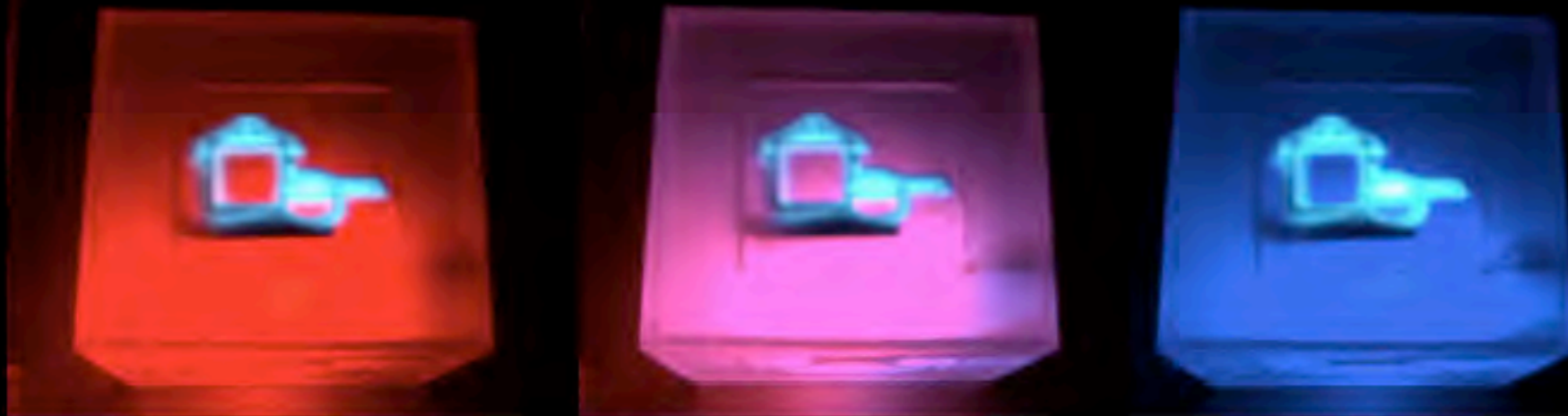


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intelligent, self-organizing building blocks

# Energy Cube

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ambient display of energy consumption

# ■ Body - Responsive Furniture

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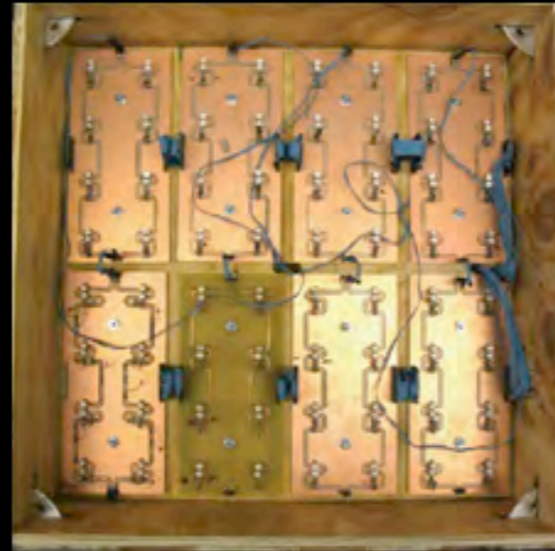
# IntelliCook - smart kitchen counter



ingredient detection, XML recipe database, grocery lists, remote food check

# Tele Tables

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telepresence, shadowing lights, row-column photocells, wireless communication

# Music Under Pressure

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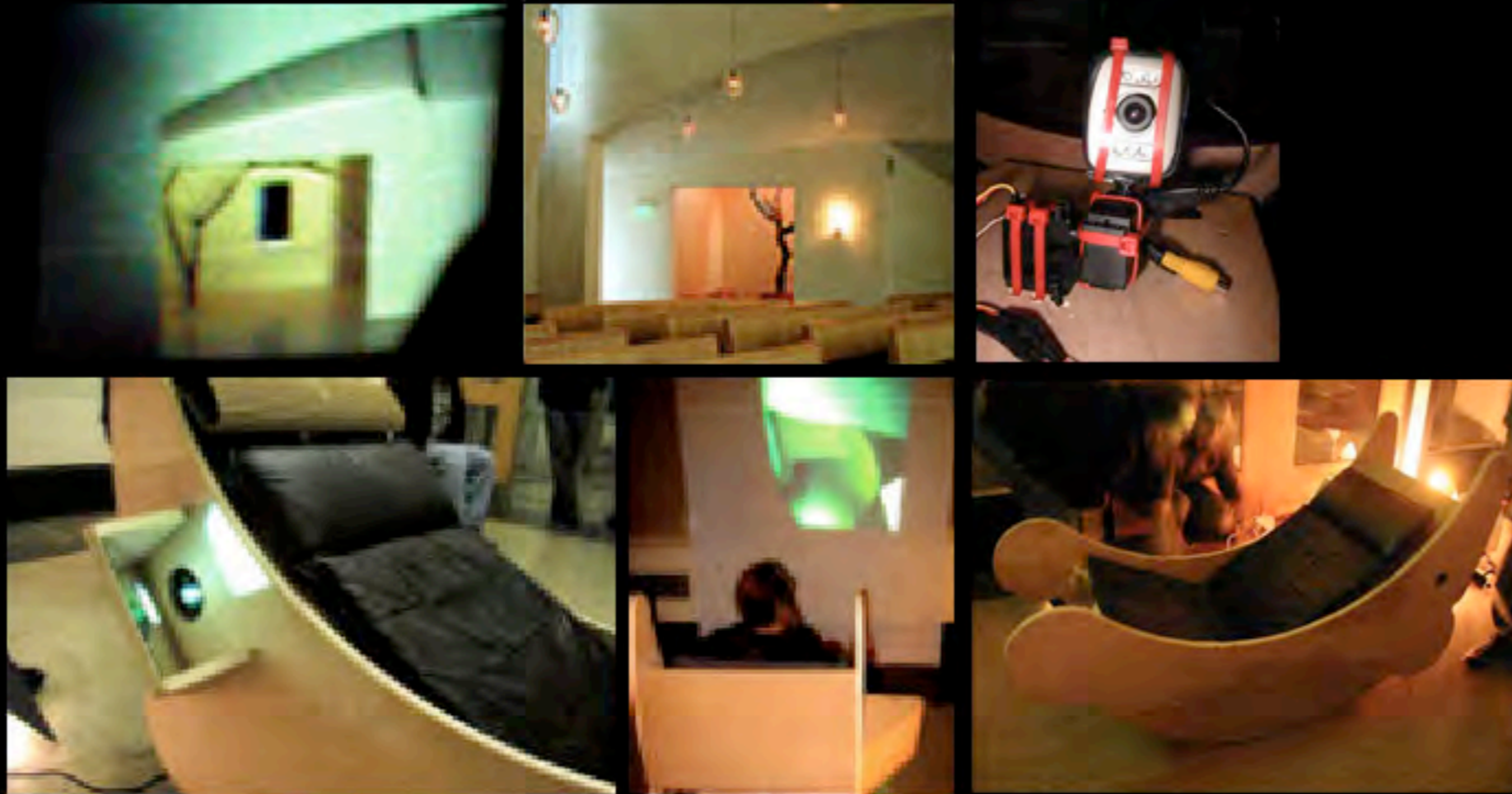


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responsive music chair with infrared rangefinders and pressure sensors

# Window Seat

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chairware interface to virtual environment with remote camera control

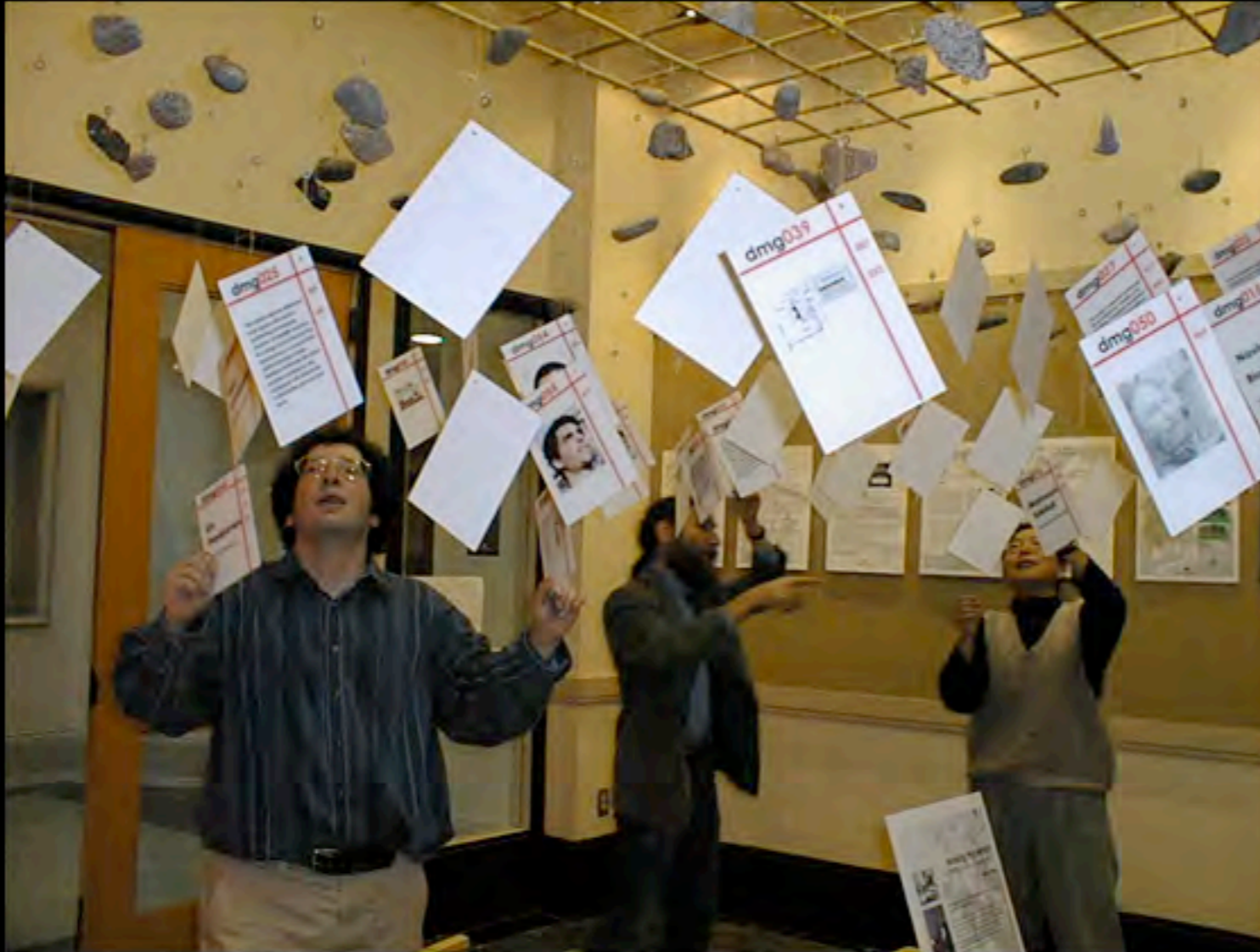
# ■ Computationally Enhanced Environments

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# Analog Hypertext

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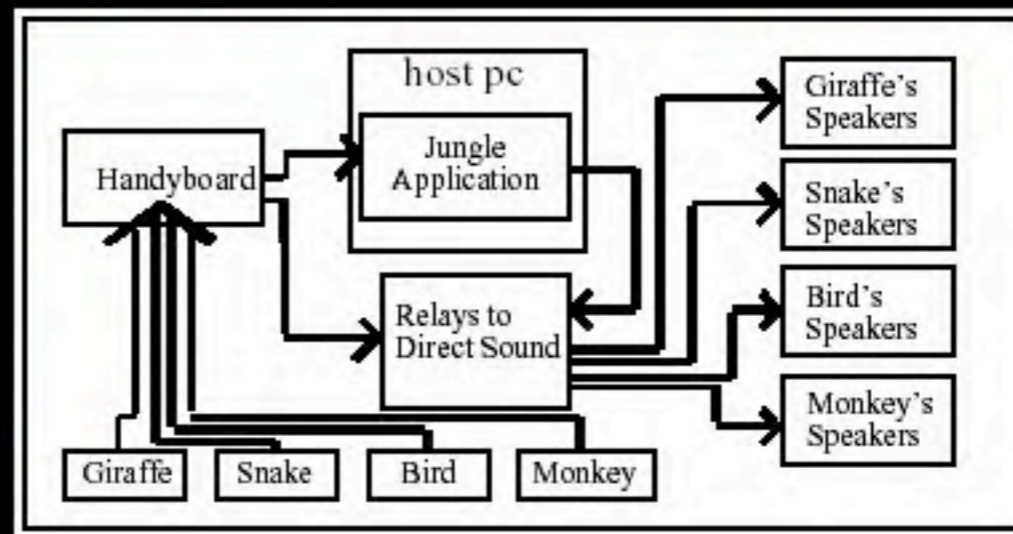
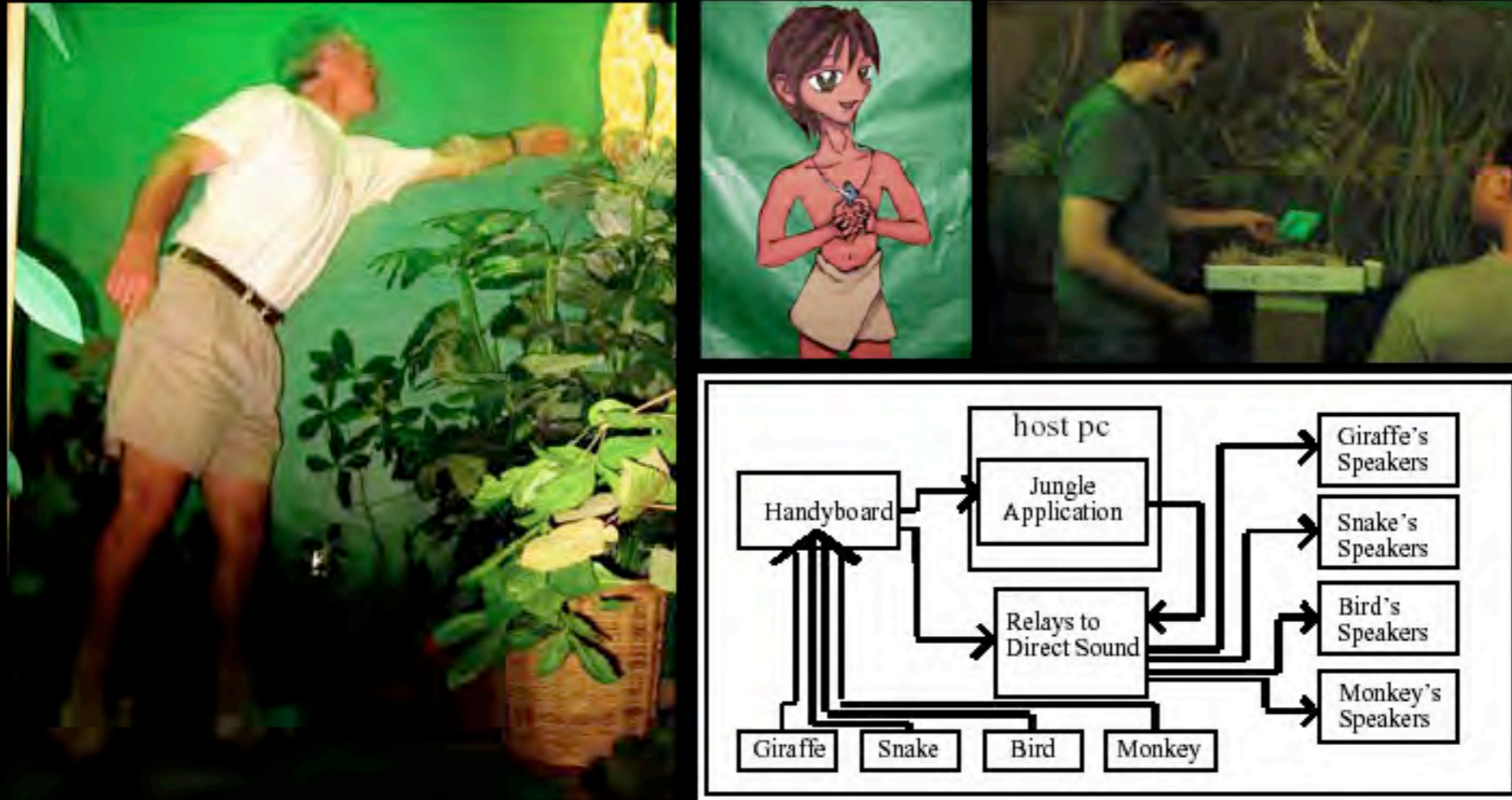


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physical demonstration of document relations

# Jungle Room

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multi-decision tree, non-linear narrative interactions

# Alphabet Paint Space

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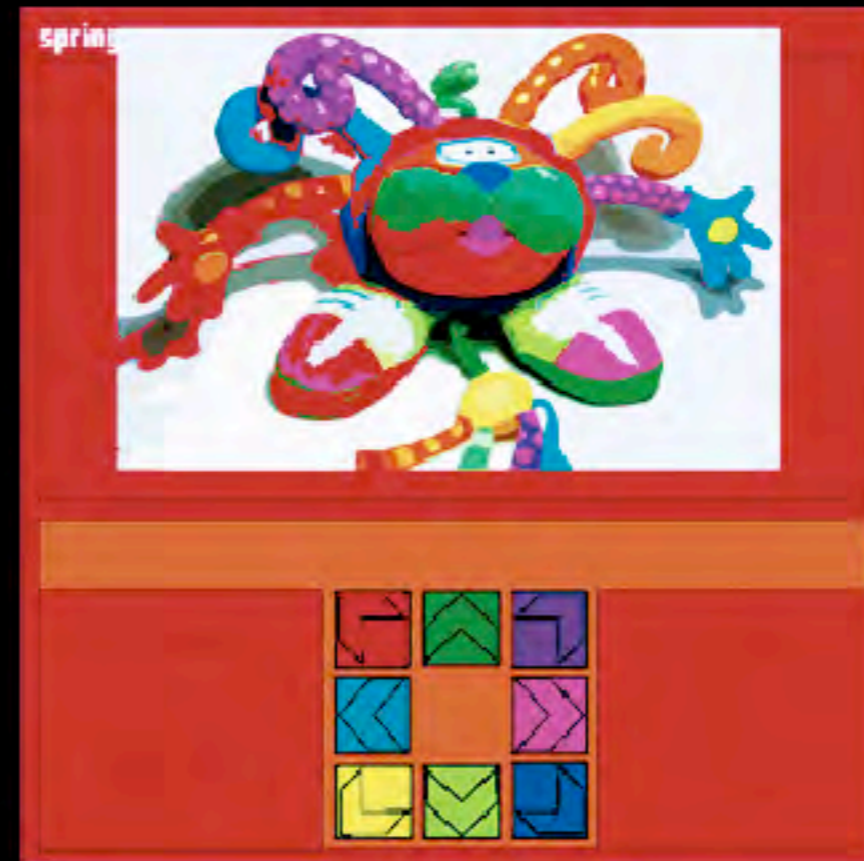


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motion capture, image processing, sensors

# Springy Kids Room

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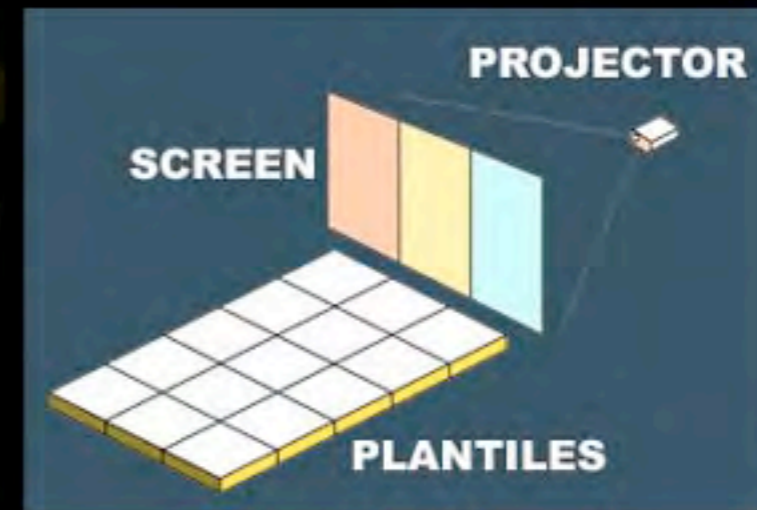


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interactive space, movement tracking, bounces and changes state setting

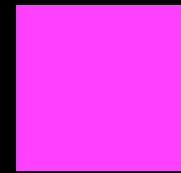
# Plant Tiles

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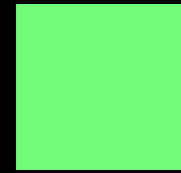
spatial interactions with embedded computation



**Intelligent Objects**



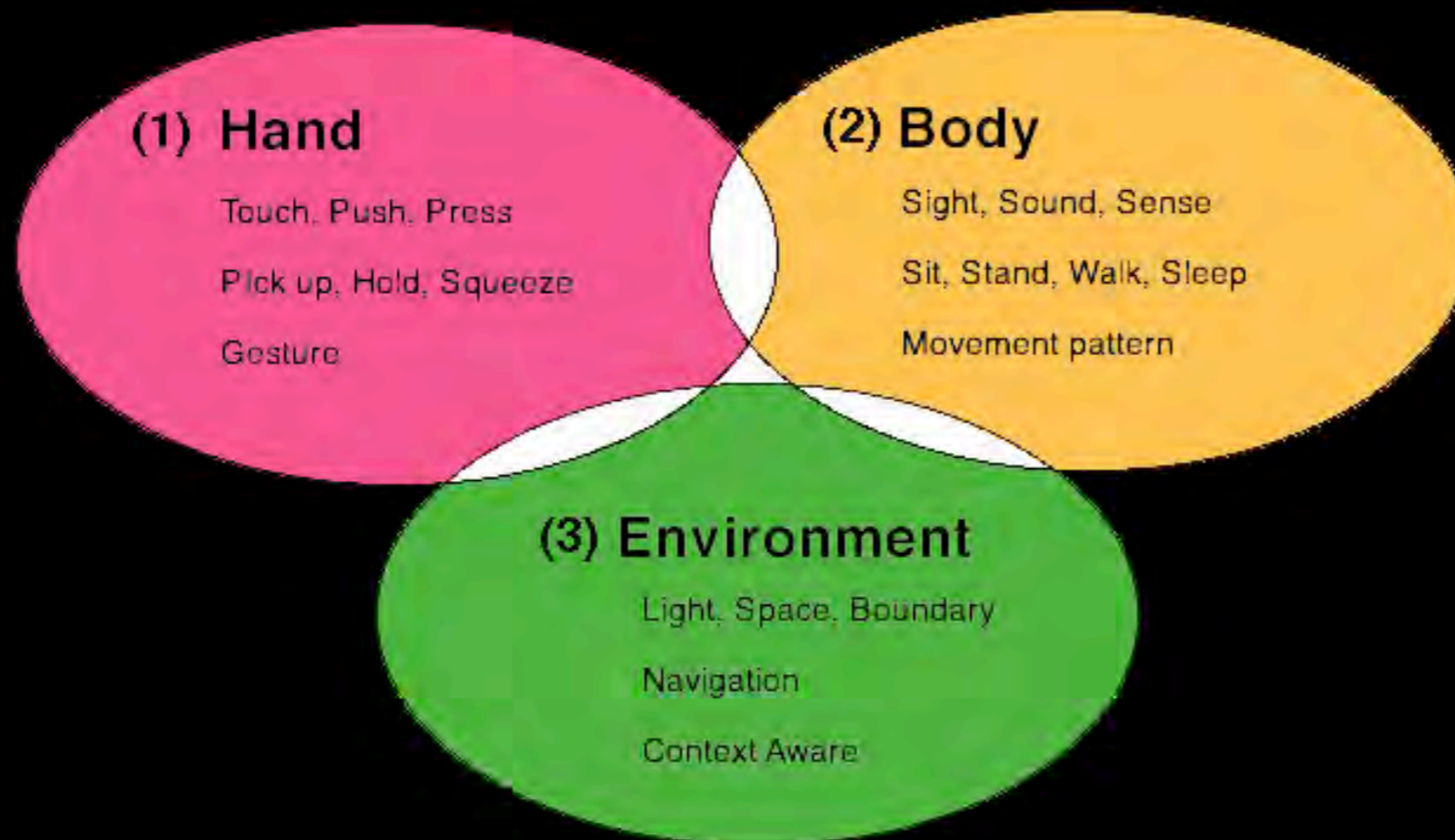
**Responsive Furniture**



**Computationally Enhanced Environments**

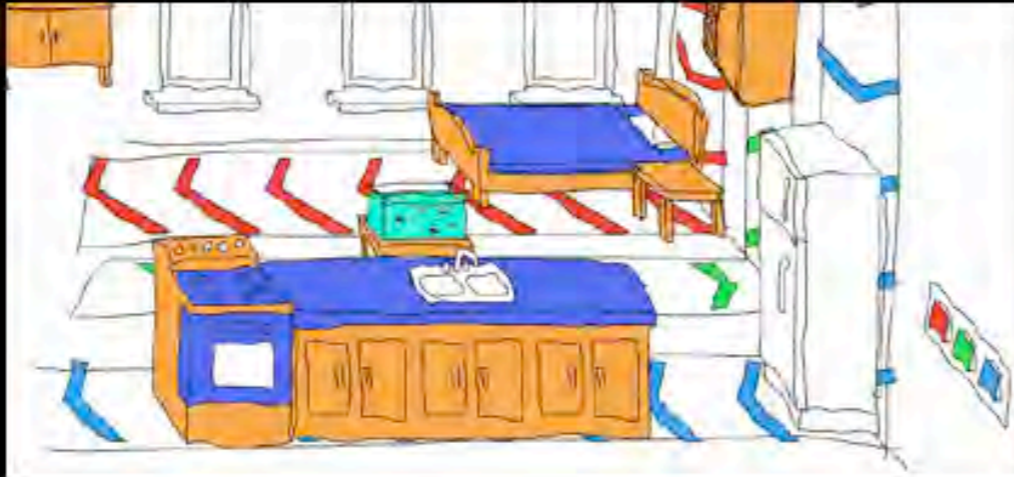
# A Human Centric View of Computational Design

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# Opportunities for Computing at Home

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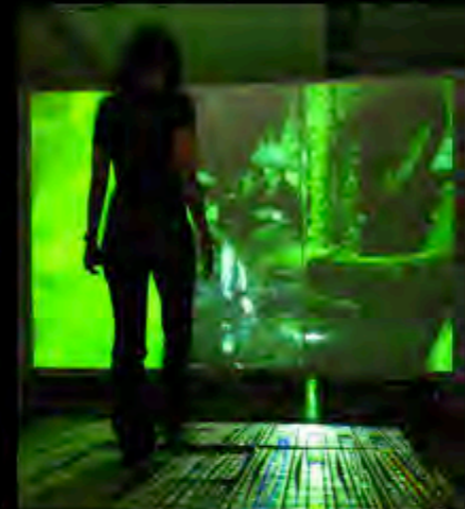


- . objects to think with
- . building as interface
- . embedded & ubiquitous computing
- . intelligent & responsive environments

## Thanks:

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