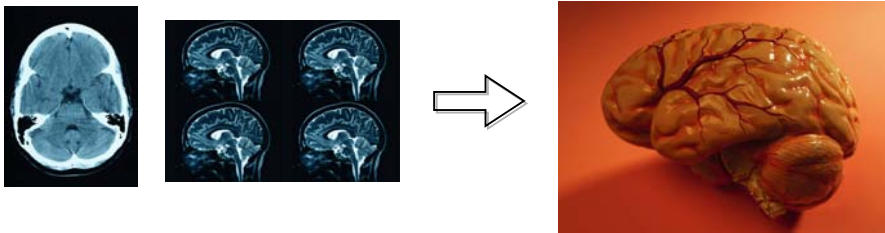


Dynamic Physical Rendering

Collaboration with Carnegie Mellon University

Real, tangible objects that change physical shape under software control

- Near-term motivation: Explore an extreme case parallelism, programming, controlling, debugging groups of millions of CPUs
- Long-term motivation: Create dramatic new forms of user interface, 3D visualization, smart antennas, morphable handhelds, etc.



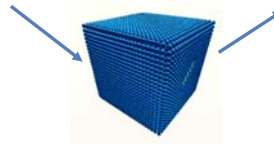
Explore 3D models and volumetric imaging data intuitively, directly.



Make computer assisted design (CAD) a "hands on" activity via tangible interaction with a live scale model.

Transmit 3D shapes as easily as faxing a document today.

Build frequency agile, steerable smart antennas.



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DPR Hardware Prototypes

Collaboration with Carnegie Mellon University

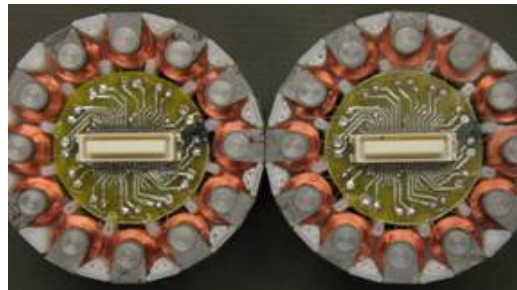
Two testbeds for exploring potential DPR motion approaches

- Goal: Induce rolling or sliding motion to let modules to rearrange themselves (using magnetic fields from coils or electric fields from capacitor plates)
- All motion is cooperative - one module always pulls/pushes on another

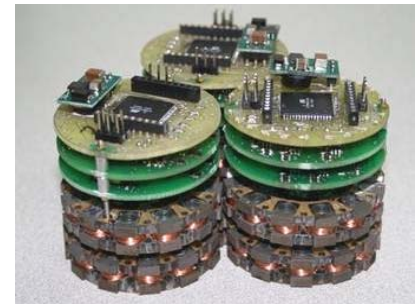
Magnetic field prototypes (5 cm diameter cylinders)



one coil



two assembled magnet rings



3 magnetic-field prototype modules, move via rolling

Electric field prototypes (25 cm cubes)



simple electrostatic latch

Fully symmetric, self-aligning electrostatic latch, moves via telescoping side panels

