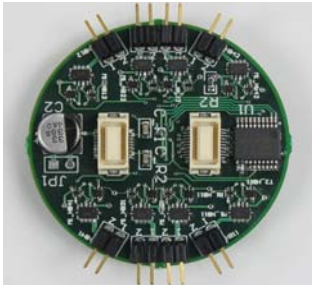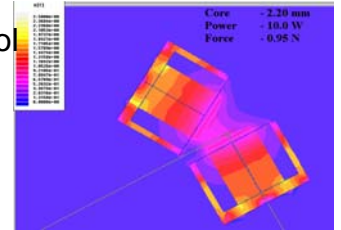# Moving Planar Catoms
Hardware Design for Catom Planar Prototypes

Brian Kirby, Burak Aksak, Seth Goldstein (CMU), Padmanabhan Pillai, Jason Campbell (Intel)
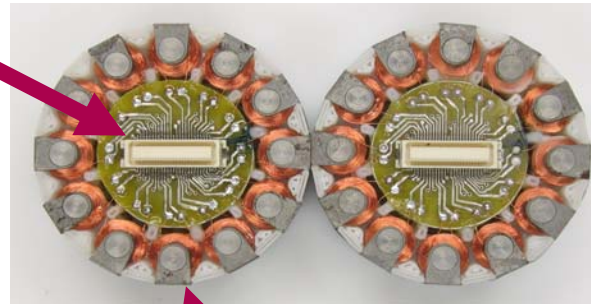
High Power Electromagnet Driver Array

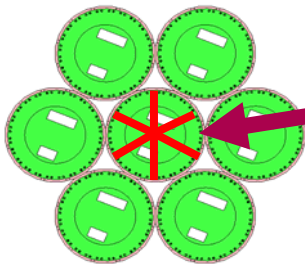Ansoft Magnetostatic FEA tool used to simulate potential magnet designs

High density interconnect used to pass coil wires from mechanical mounting to electronics

- Each driver in array can deliver bursts of up to 50W

- PWM modulation allows variable current

- Pulses for movement or a low current trickle to hold an ensemble in place

Groups of 4 adjacent magnets will never activate simultaneously – reduction in number of high power transistors

Each catom is comprised of 24 magnets in two offset rings of 12.

Global and Intercatom communications

•Communication is key to a claytronics ensemble

- 24 independent IRda transmit/receive pairs allow for communications on a contact by contact basis

- Muxing allows catom to use high speed uart on select lines in addition to low speed polling

•Global communication makes debugging and reprogramming of large ensembles practical
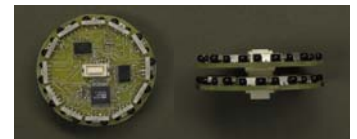
An IRda array module to allow localized communications

•IRda transmitters and receivers are separately muxed to allow transmit and receive on separate channels

- Broadcast mode allows fast transmitting on all channels simultaneously

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