

# EFFECT OF HESITATION ON PERCEPTION OF INTELLIGENCE

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# PURPOSE

- To study human perception of intentionality of thought and actions within the robot.
- The effect of robot thinking behaviors on human decision making and speed.
- To study human's connection to and perception of the naturalness of their robot opponent.

# HOW DID WE TEST THIS?

Neutral Sounds

Thought Sounds

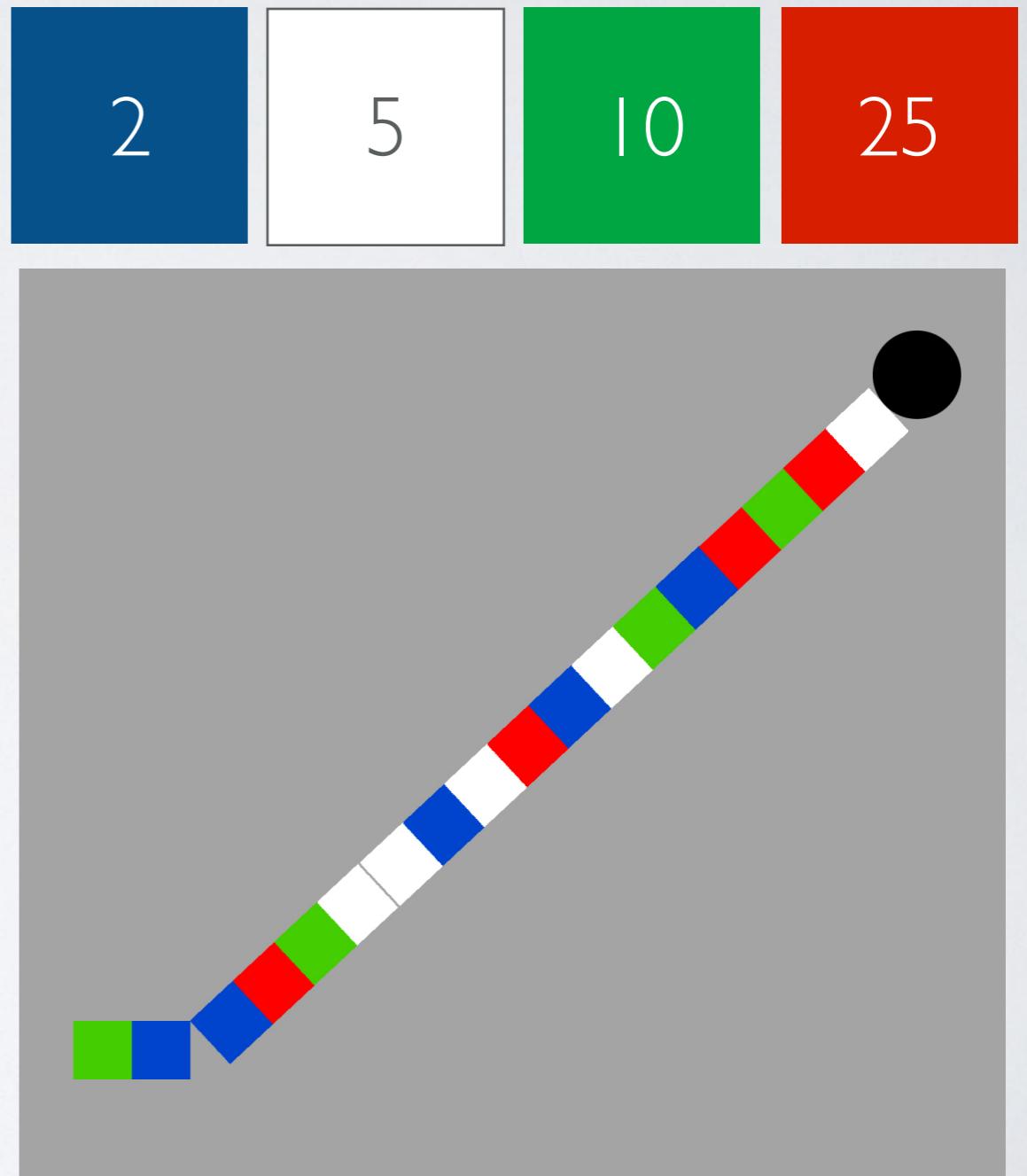
Neutral Sounds & Hesitation

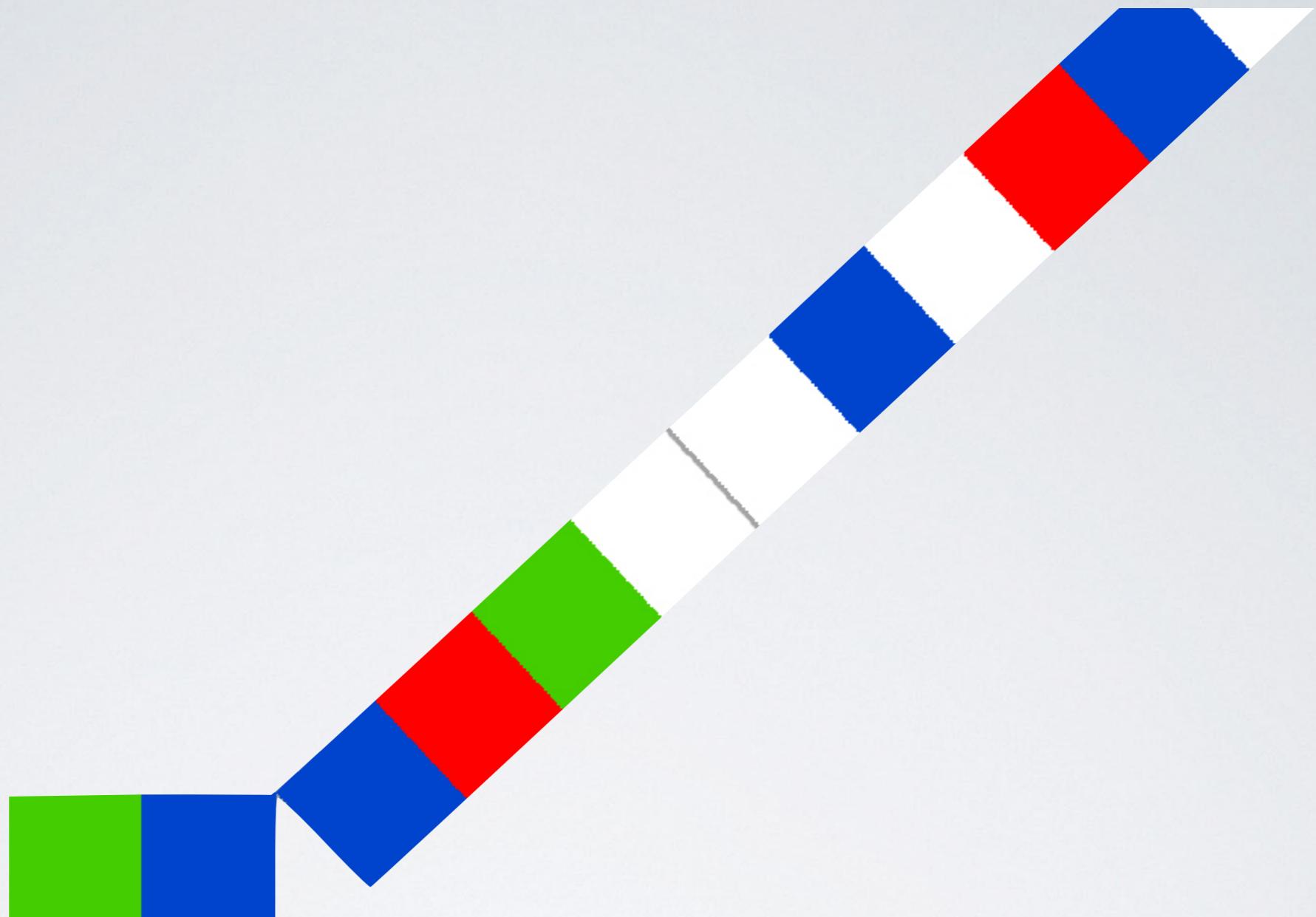
Thought Sounds & Hesitation

TAKE TWO

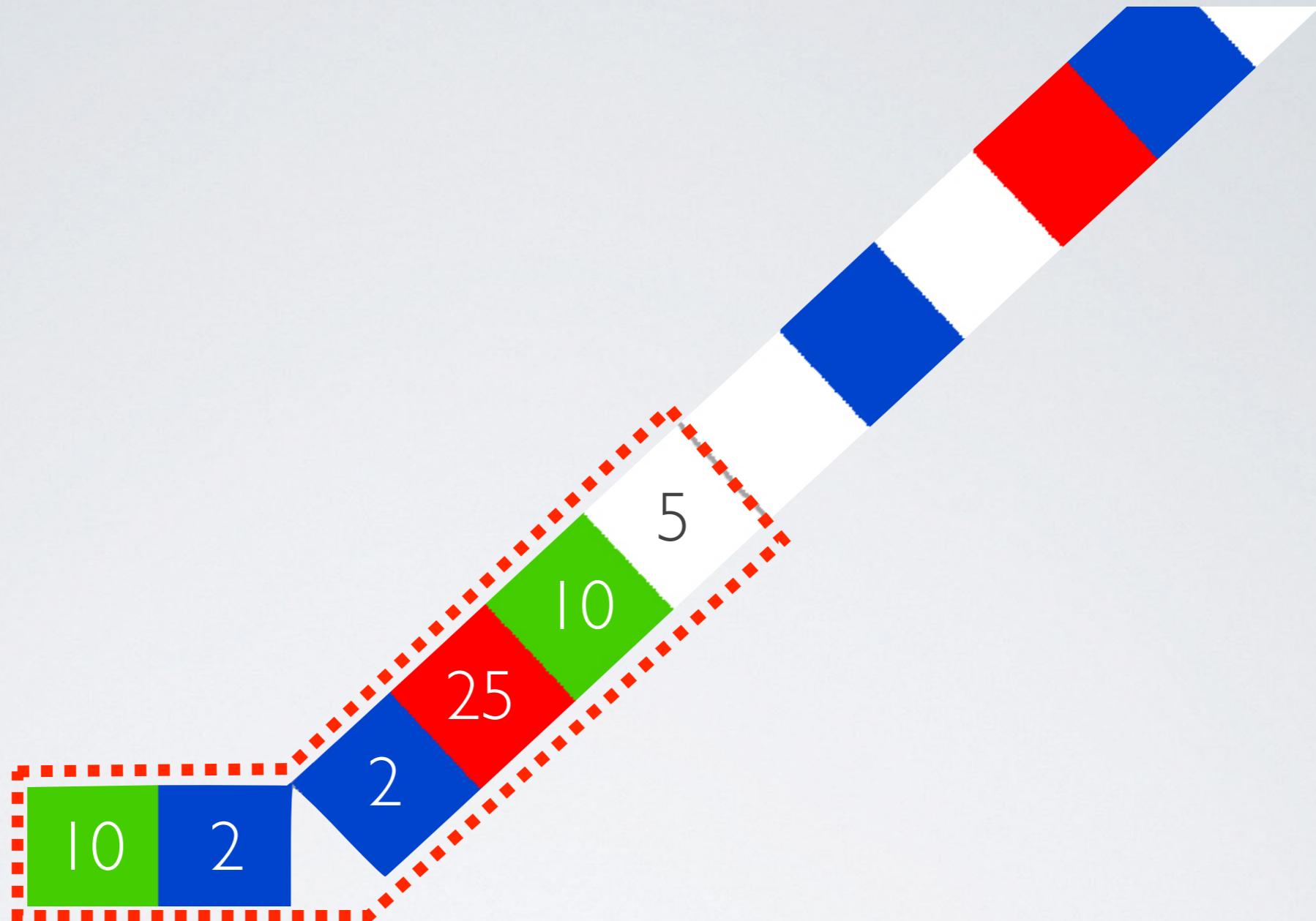
# TAKE TWO

- Played in order (ie. can only choose blocks from the front of the ramp).
  - Choose 1 or 2 blocks per turn.
  - Each block color is assigned a point value.
  - Winner is the person with the highest score when no blocks left.
  - Goal: Maximize your points.





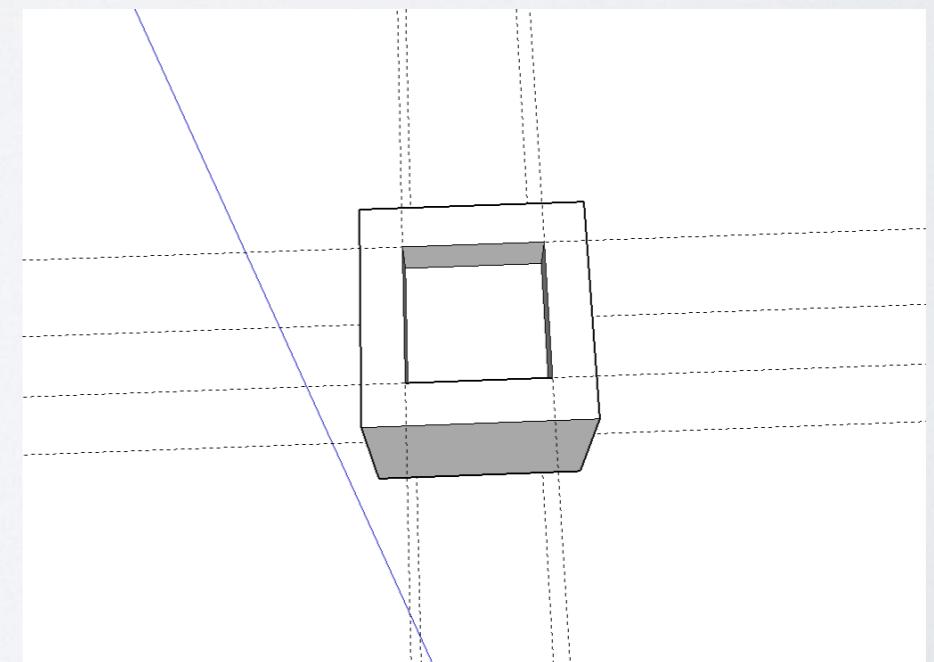
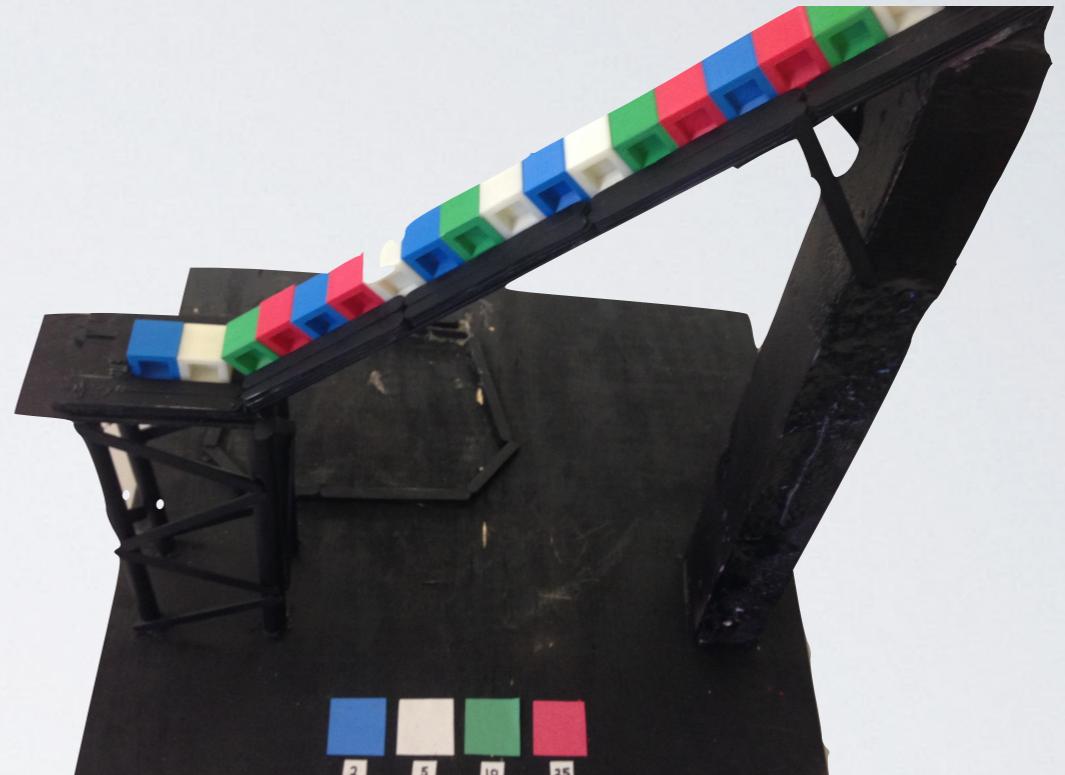
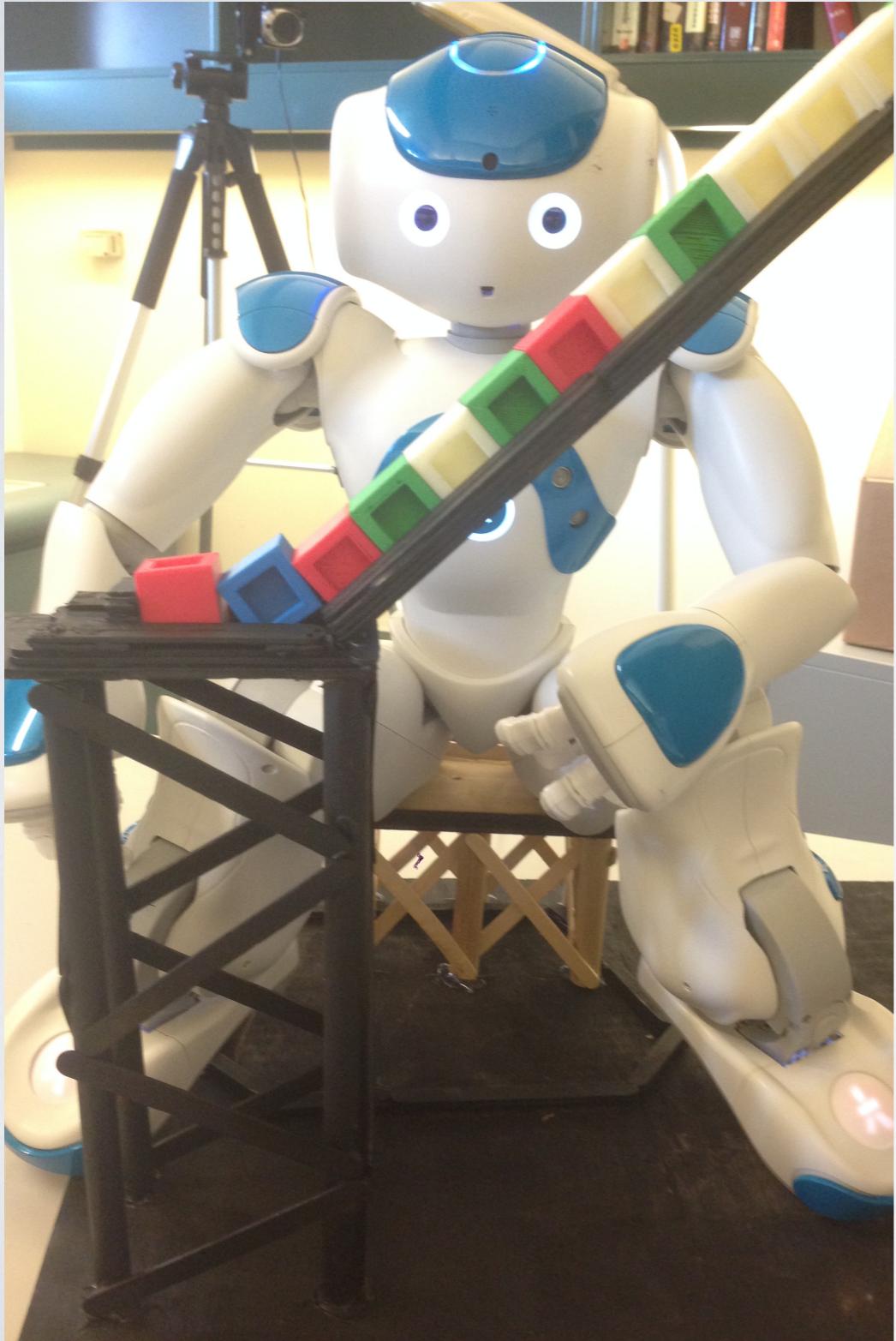
# THE ALGORITHM

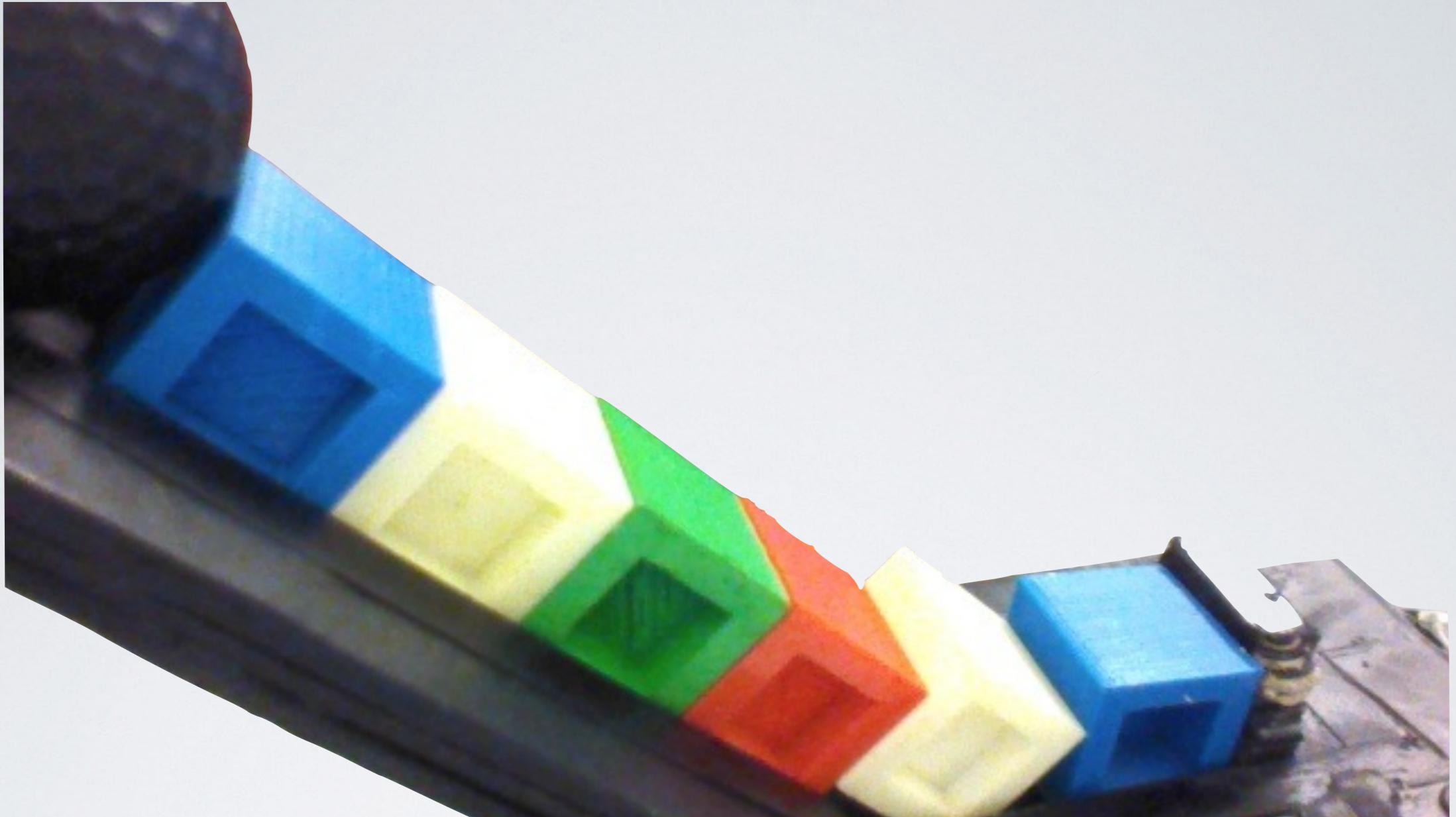


# THE ALGORITHM

# HARDWARE

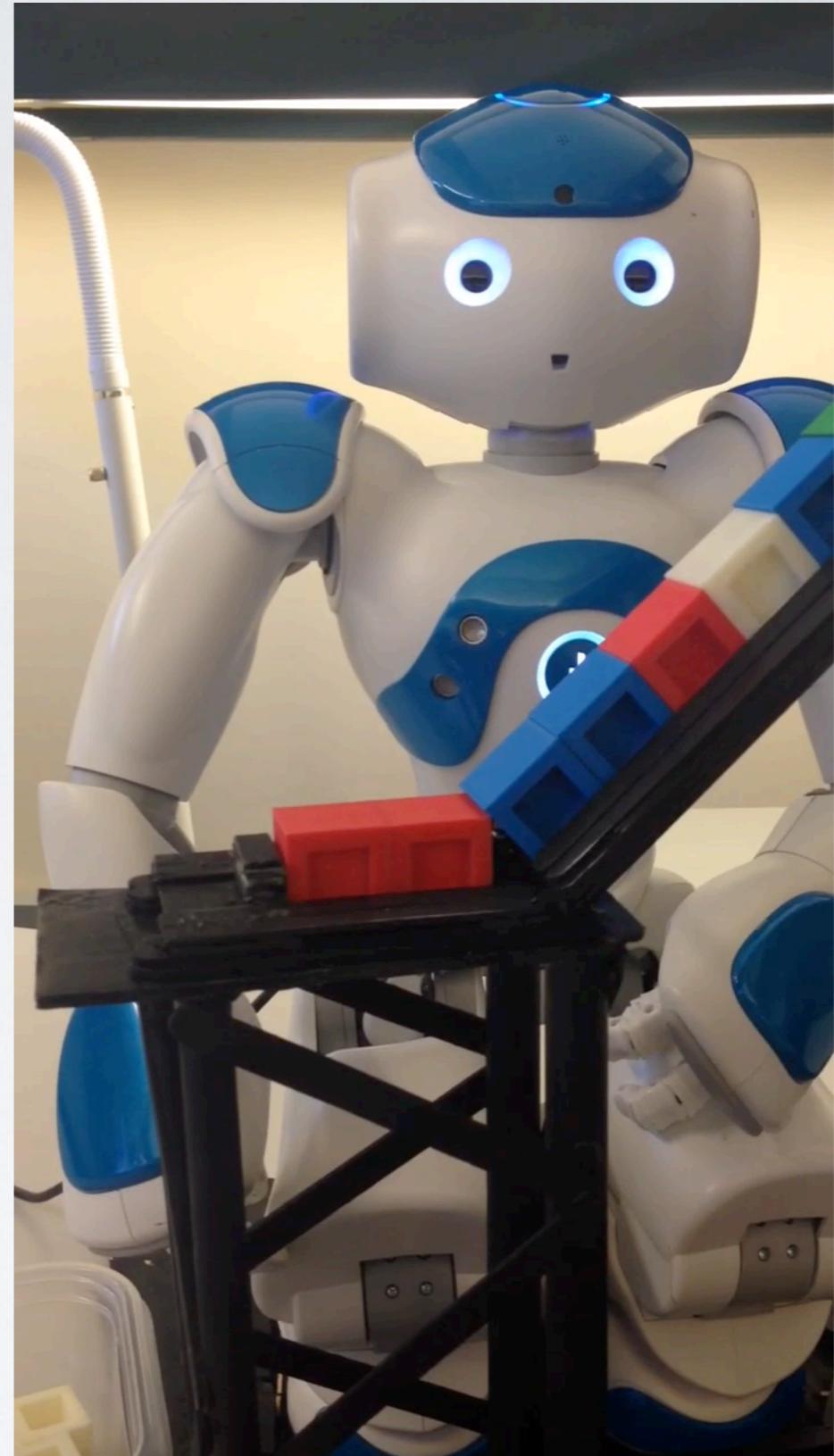
# HARDWARE



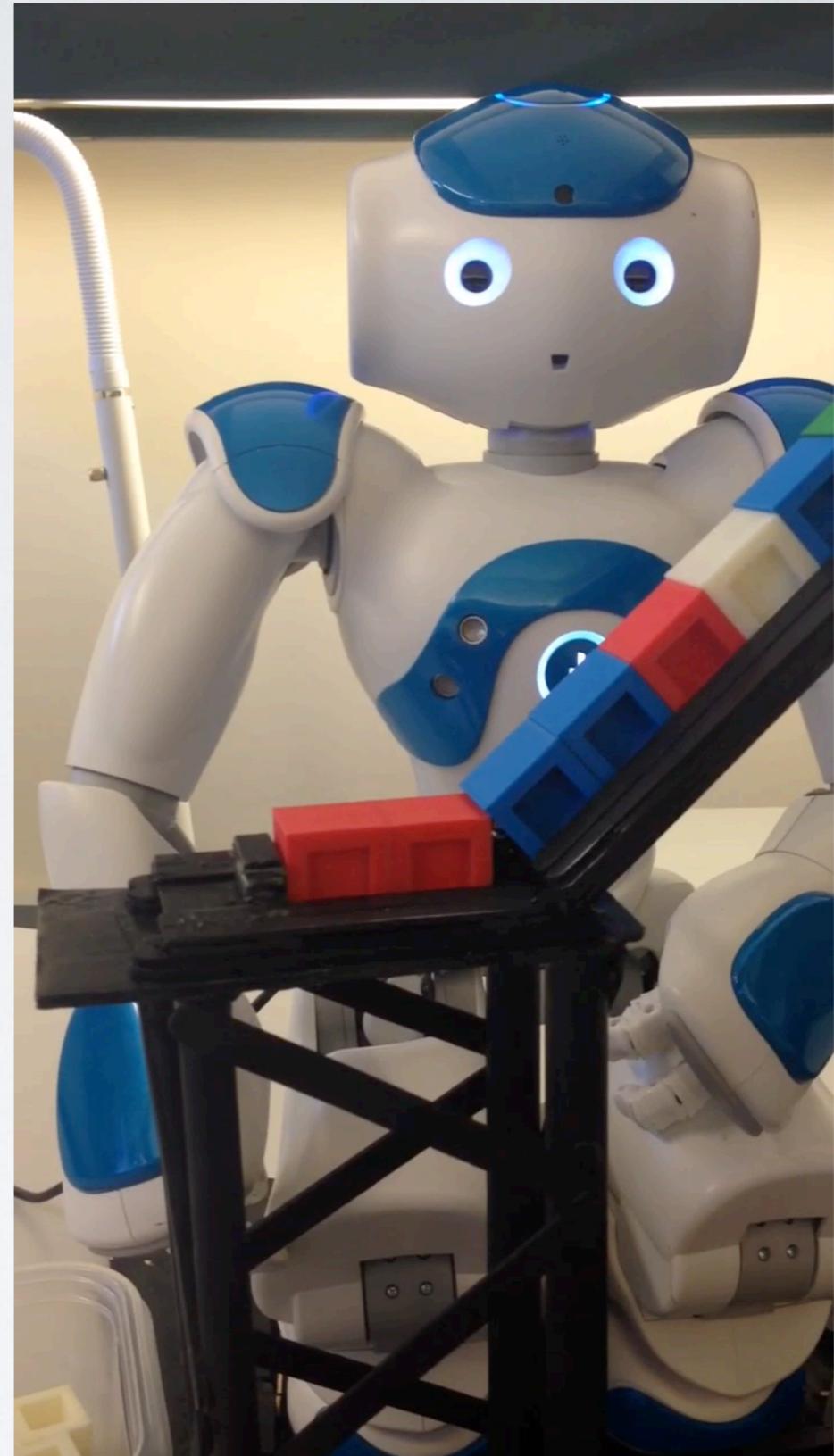


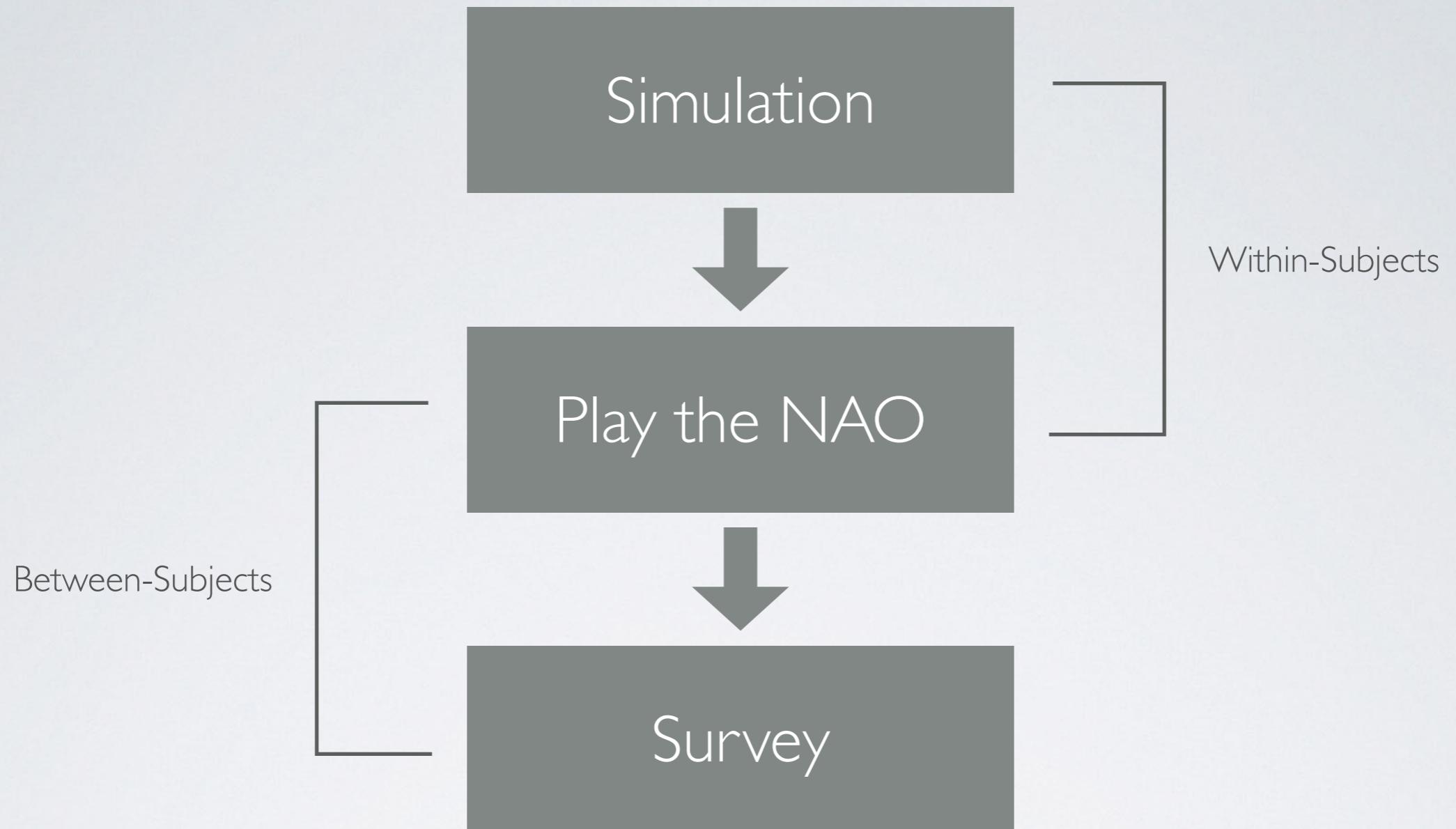
# CHOOSING BLOCKS

# GRABBING BLOCKS

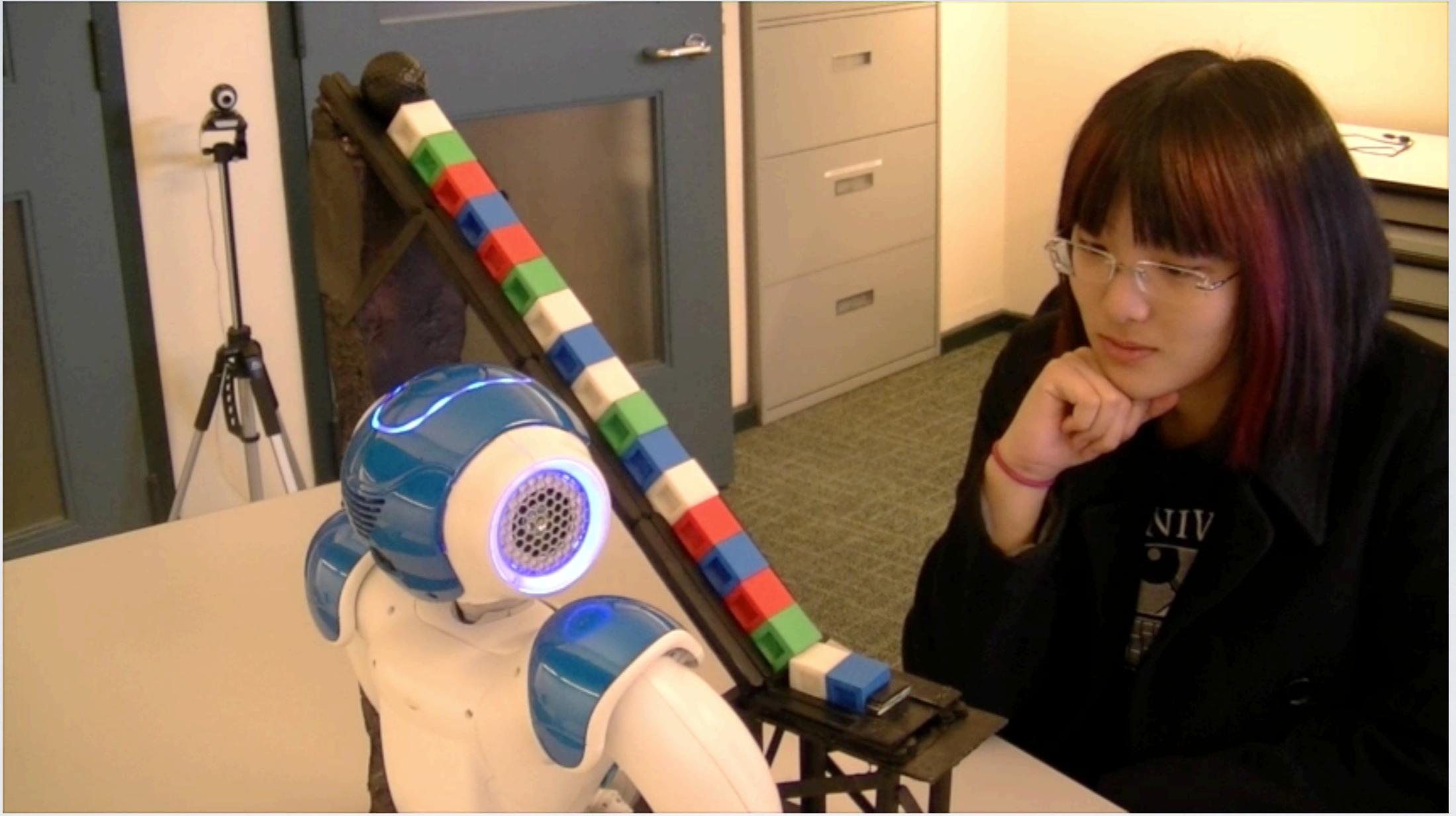


# GRABBING BLOCKS

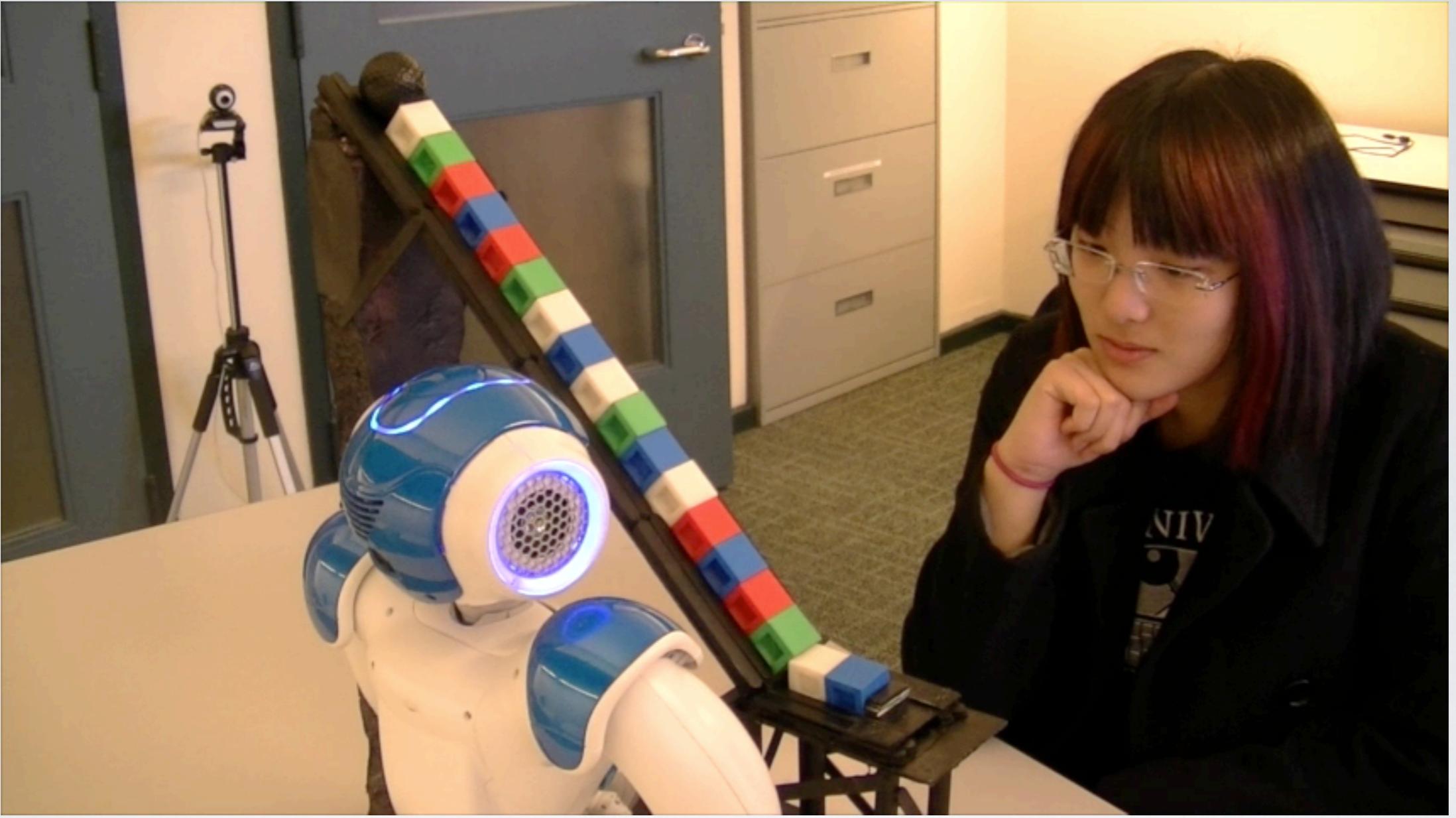




# EXPERIMENTAL DESIGN (MIXED EXPERIMENT)



# DEMO VIDEO



# DEMO VIDEO

# RESULTS

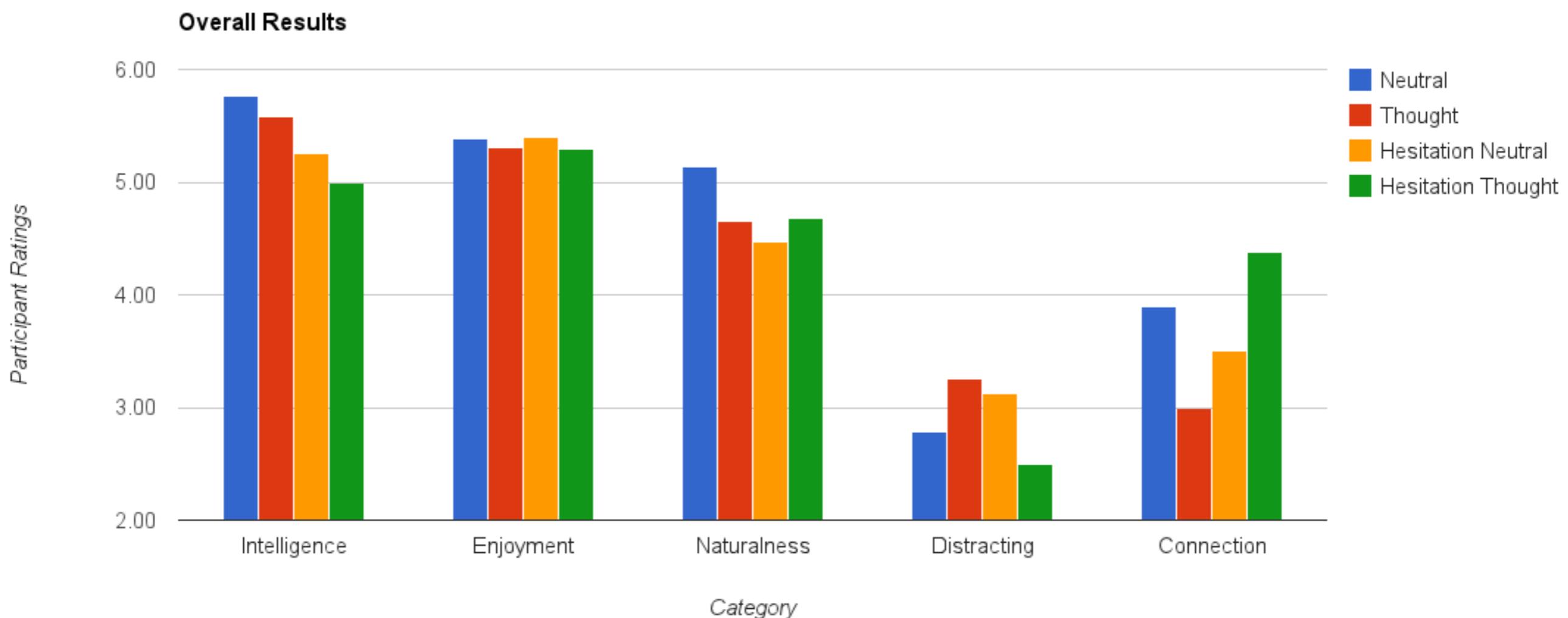
# RESULTS

- 37 Participants - 5 discounted
- *Hypothesis:* Hesitating, thinking robot would yield higher intelligence and connectivity ratings.
- *Hypothesis:* Hesitating, non-thinking robot would seem slow and/or broken.

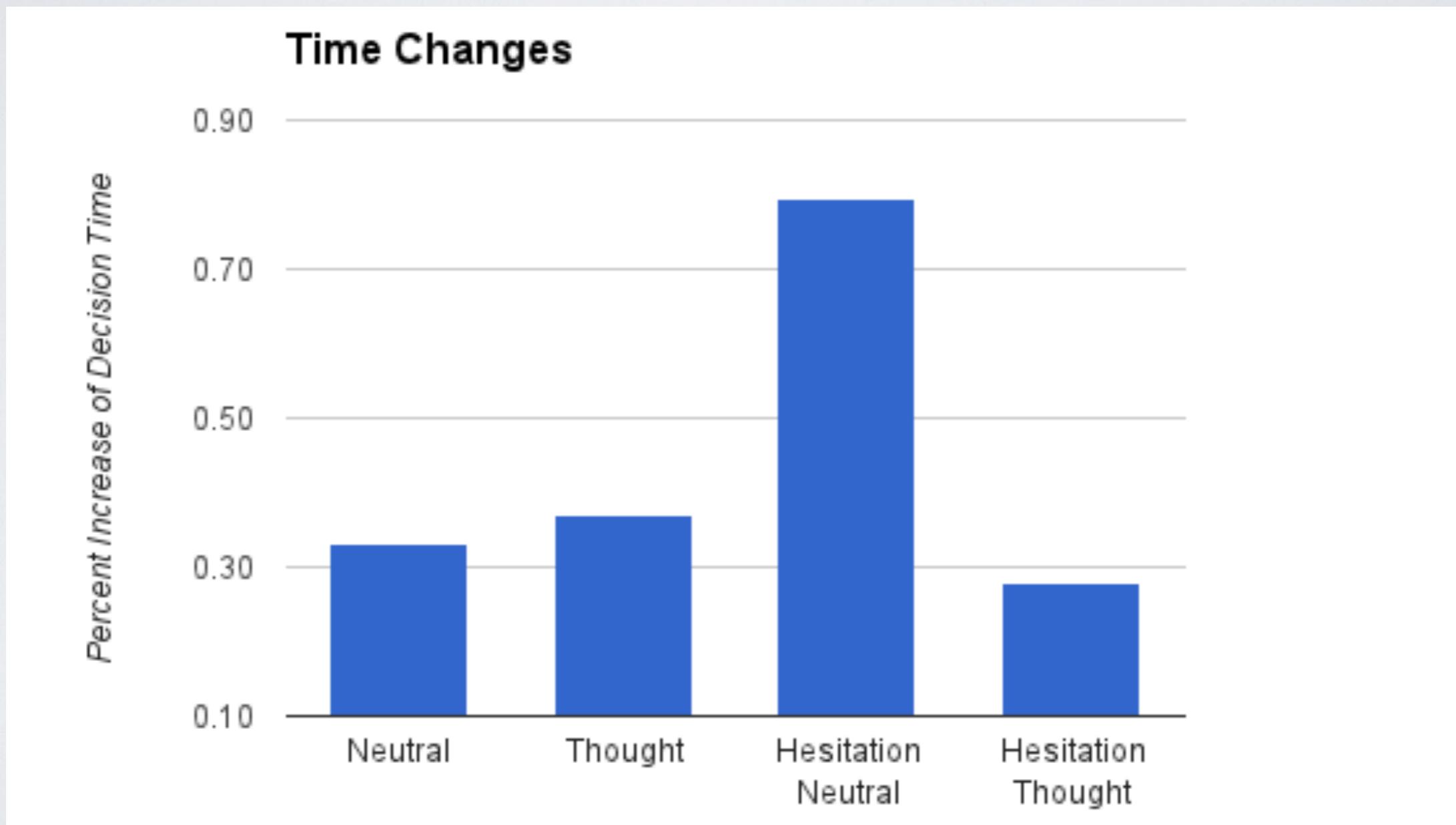
# RESULTS

	Hesitation p-value	Sound p-value	Interaction p-value
<b>Intelligence</b>	0.0250	0.2555	0.8181
<b>Enjoyment</b>	1.0000	0.7013	1.0000
<b>Naturalness</b>	0.3402	0.6462	0.2314
<b>Distraction</b>	0.7359	0.9104	0.3156
<b>Connectedness</b>	0.7359	0.9104	0.3156
<b>Decision Time</b>	0.4474	0.2541	0.2429

# RESULTS



# RESULTS



# IMPROVEMENTS

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- Less involved, more familiar game to remove some of the novelty effect.
- More advanced color perception and enhanced lighting.
- Possibility of longer hesitations times and movements.

# CONCLUSIONS

# QUESTIONS

# SOUNDS

Clocks

Hmmm

Scanner

Mmm

Wind

Ummmm

Umm

# SOUNDS

Clocks

Hmmm

Scanner

Mmm

Wind

Ummmm

Umm

# SOUNDS

Clocks

Hmmm

Scanner

Mmm

Wind

Ummmm

Umm

# SOUNDS

Clocks

Hmmm

Scanner

Mmm

Wind

Ummmm

Umm

# SOUNDS

Clocks

Hmmm

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Wind

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# SOUNDS

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# SOUNDS

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Umm