the gamedesigninitiative at cornell university

Lecture 5

Nondigital Prototypes

Review: Prototypes

- An *incomplete* model of your product
  - Implements small subset of the final features
  - Features chosen are the most important **now**
- Prototype helps you visualize **gameplay**
  - Way for you to test a new game mechanic
  - Allows you to tune mechanic parameters
  - Can also test (some) user interfaces

Software Prototypes

- **Gameplay Prototype** (2/24)
  - Throw-away prototype (not in final submission)
  - Does not have to be on device
  - Should demonstrate core gameplay
- **Technical Prototype** (3/10)
  - Evolutionary Prototype (part of final submission)
  - Should be on a device except in extreme cases
  - Should demonstrate important mobile challenge

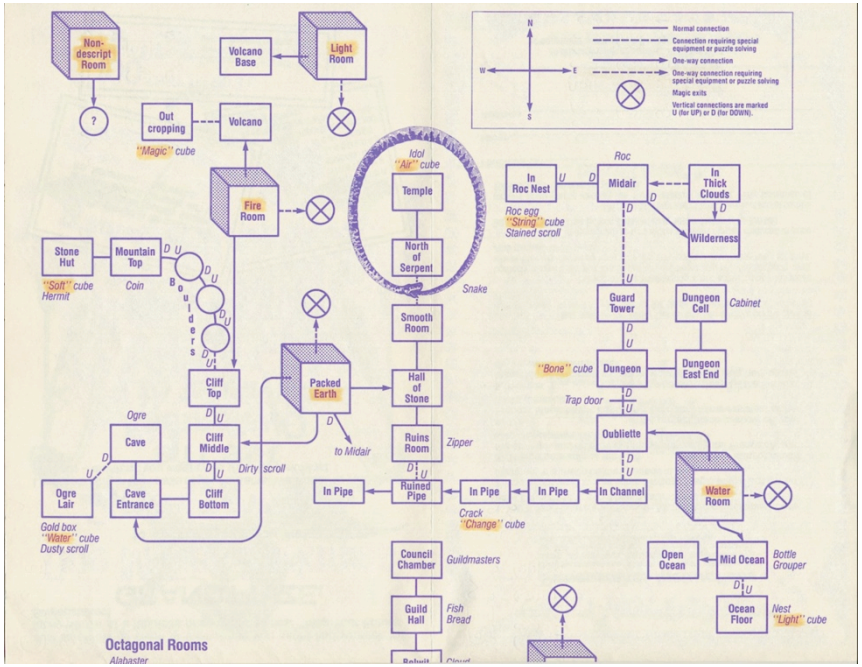
Next Week: Nondigital Prototype

- No software involved at all
  - Board game
  - Card game
  - Something different?

- Goal is to **model gameplay**
  - How? Nondigital/digital is very different
  - Model will be far removed from final result
  - What can we hope to learn from this?

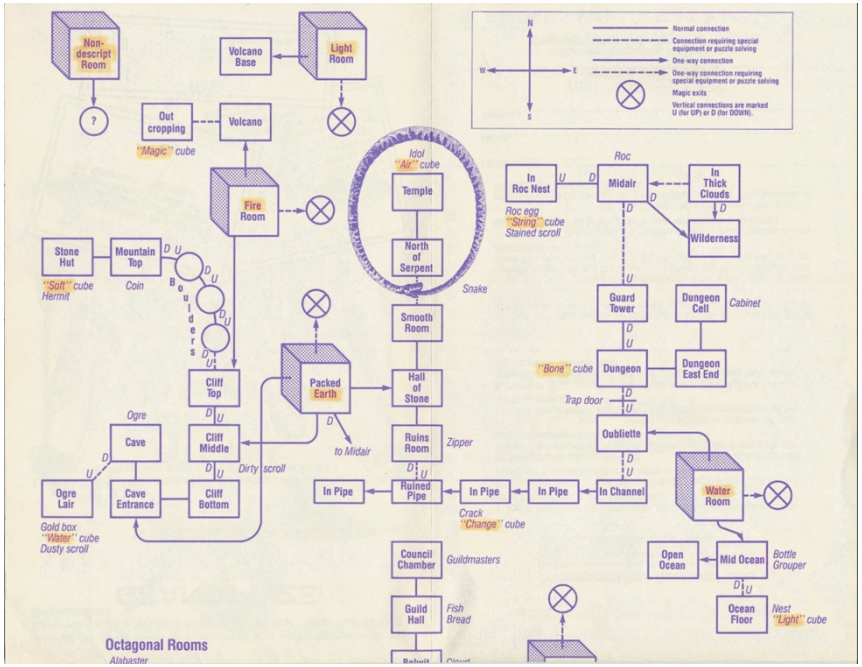
Understanding Game Progression

- Level design about *progress*
  - Sense of closeness to goal
  - Choice of "paths" to goal (**dilemma challenge**)
  - Path choice can relate to play style and/or difficult
- Easier to design if *discrete*
  - Flow-chart out progression
  - Edges are mechanic(s)
- But game state values are **continuous** (sort of)



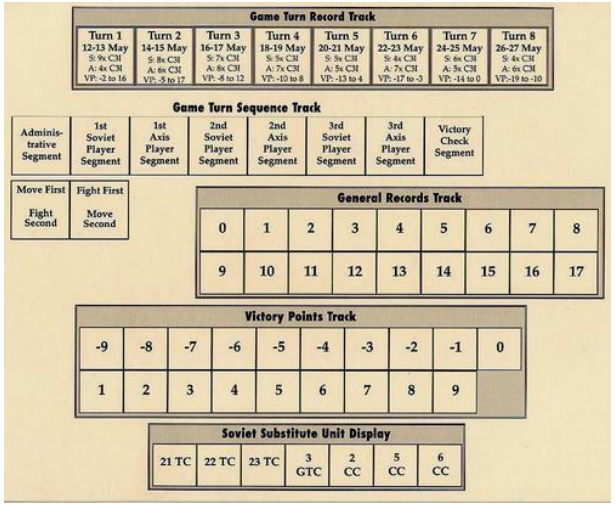
Discrete Progression

- Design is **discretization**
  - Impose flow chart on state
  - Each box is an equivalence class of game states
- **Spatial Discretization**
  - Contiguous zones
  - **Example**: past a doorway
- **Resource Discretization**
  - Range of resource values
  - **Example**: build threshold



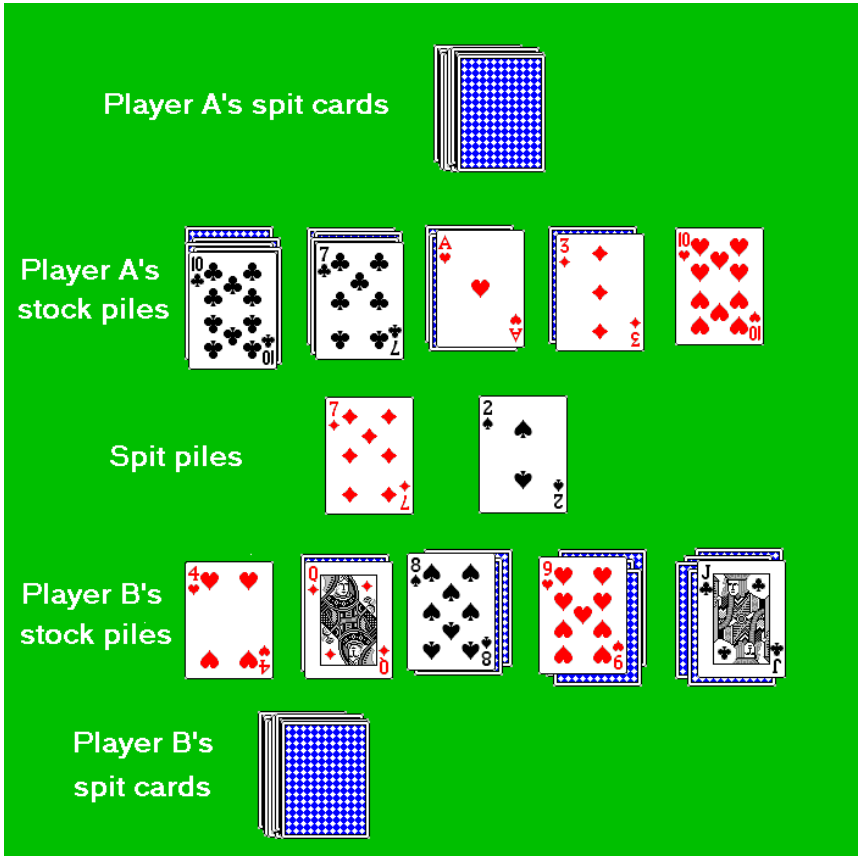
Discretization and Turns

- Discretization requires *turns*
  - Represent a unit of action
  - When done, game "at rest"
- Turns can be **multistep**
  - Multiple actions in a turn
  - Evironmental interactions
- Turns can **alternate**
  - between other players
  - with a gamemaster
  - not at all (one player?)

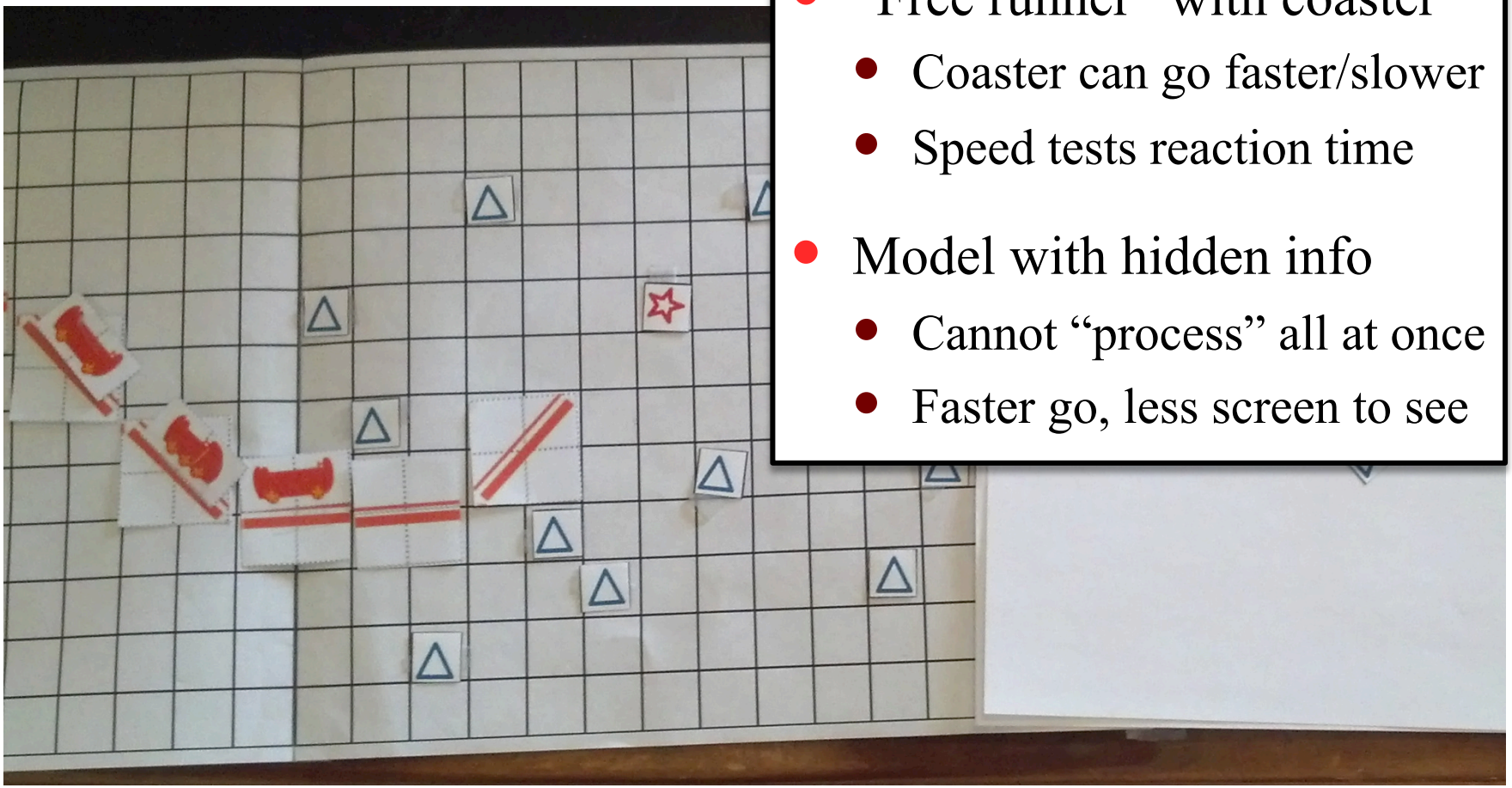


Discretization and Reaction Time

- Allow opponent to **interrupt**
  - Action that reacts to yours
  - Played after you act, but before action takes an effect
  - Core mechanic in *Magic:TG*
- Make play **asynchronous**
  - Players still have turns
  - But take turns as fast as can
  - Conflicts resolved via speed
  - Often need a referee for aid

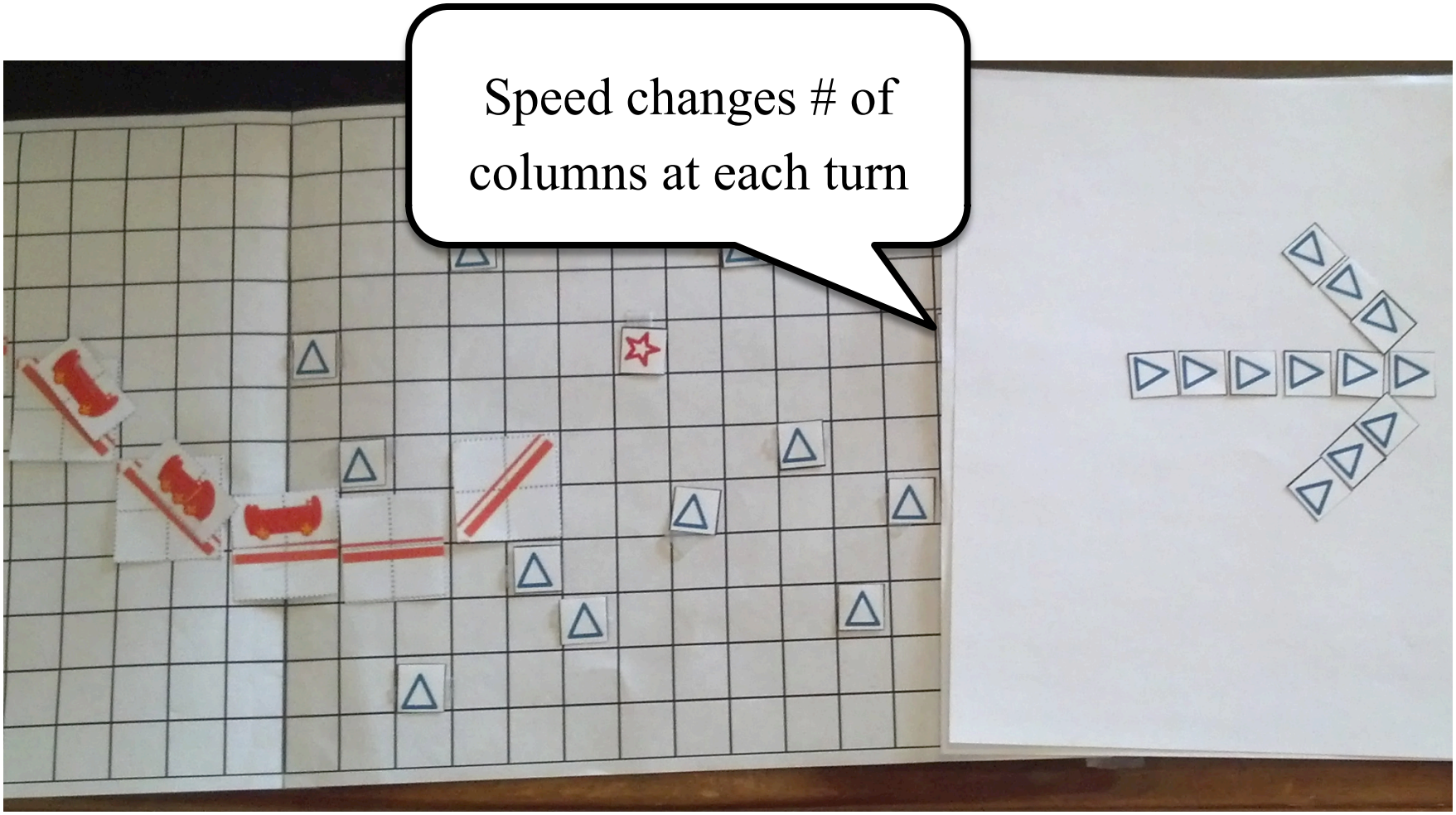


Reaction Time: *Runaway Rails*



- "Free runner" with coaster
  - Coaster can go faster/slower
  - Speed tests reaction time
- Model with hidden info
  - Cannot "process" all at once
  - Faster go, less screen to see

Reaction Time: *Runaway Rails*



What Can We Do Discretely?

- **Evaluate emergent behavior**
  - Allow player to commit simultaneous actions
  - Model interactions as "board elements"
- **Model player cost-benefit analyses**
  - Model all resources with sources and sinks
  - Focus on economic dilemma challenges
- **Test player difficulty/usability**
  - Ideal for puzzle games (or puzzle elements)
  - Can also evaluate unusual interfaces

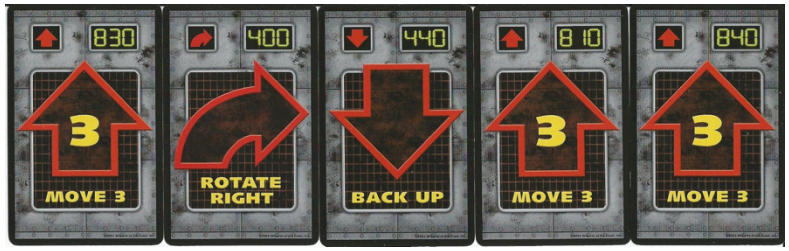
What Can We Do Discretely?

- **Evaluate emergent behavior**
  - Allow player to commit simult… …ons
  - Model interactions a…
- **Model… …ent analyses**
  - Mod… …ources with sources and sinks
  - Focus on economic dilemma challenges
- **Test player difficulty/usability**
  - Ideal for puzzle games (or puzzle el…
  - Can also evaluate unusual interfaces

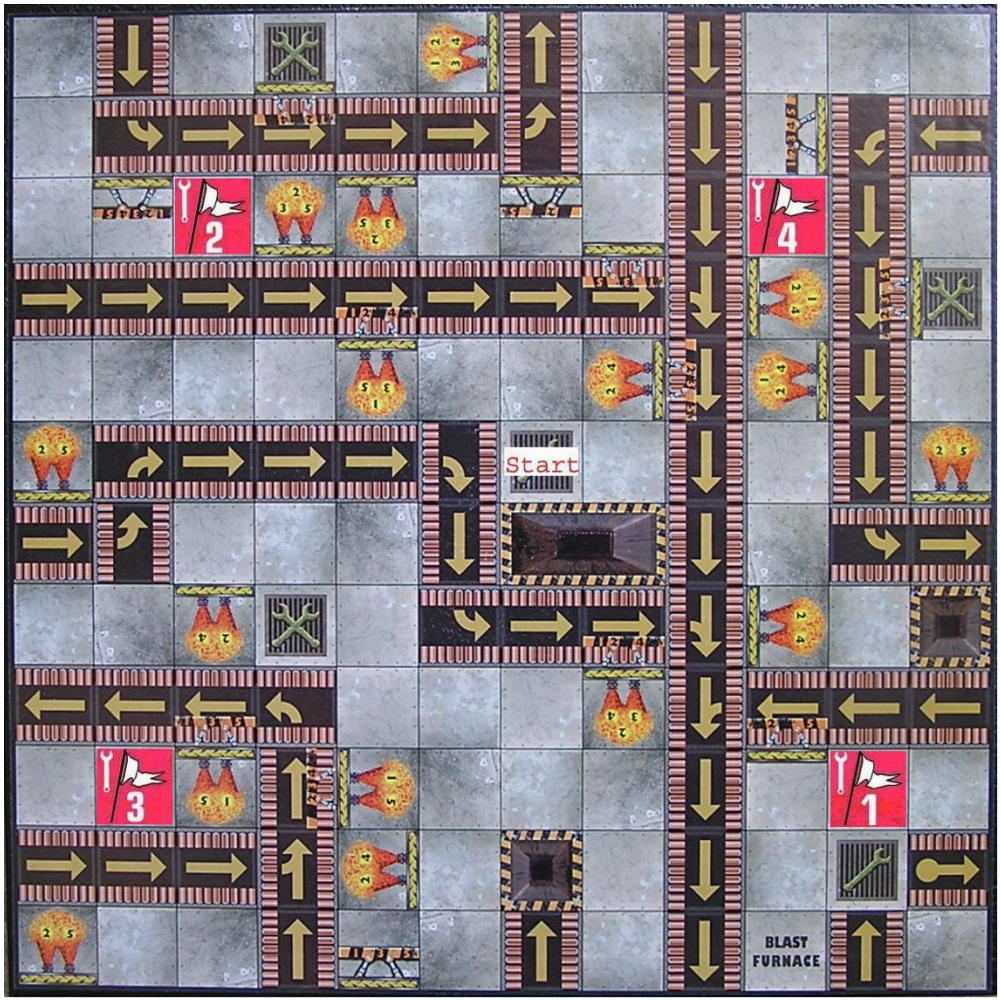
Not that different from CS 3152

Particularly important for mobile games

Interactions: *RoboRally*



- Player "programs" robot
  - Picks 5 movement cards
  - Committed to that choice
- After each card
  - Obey board elements in order
  - Check robot collisions
- Move = board elements + cards + collisions

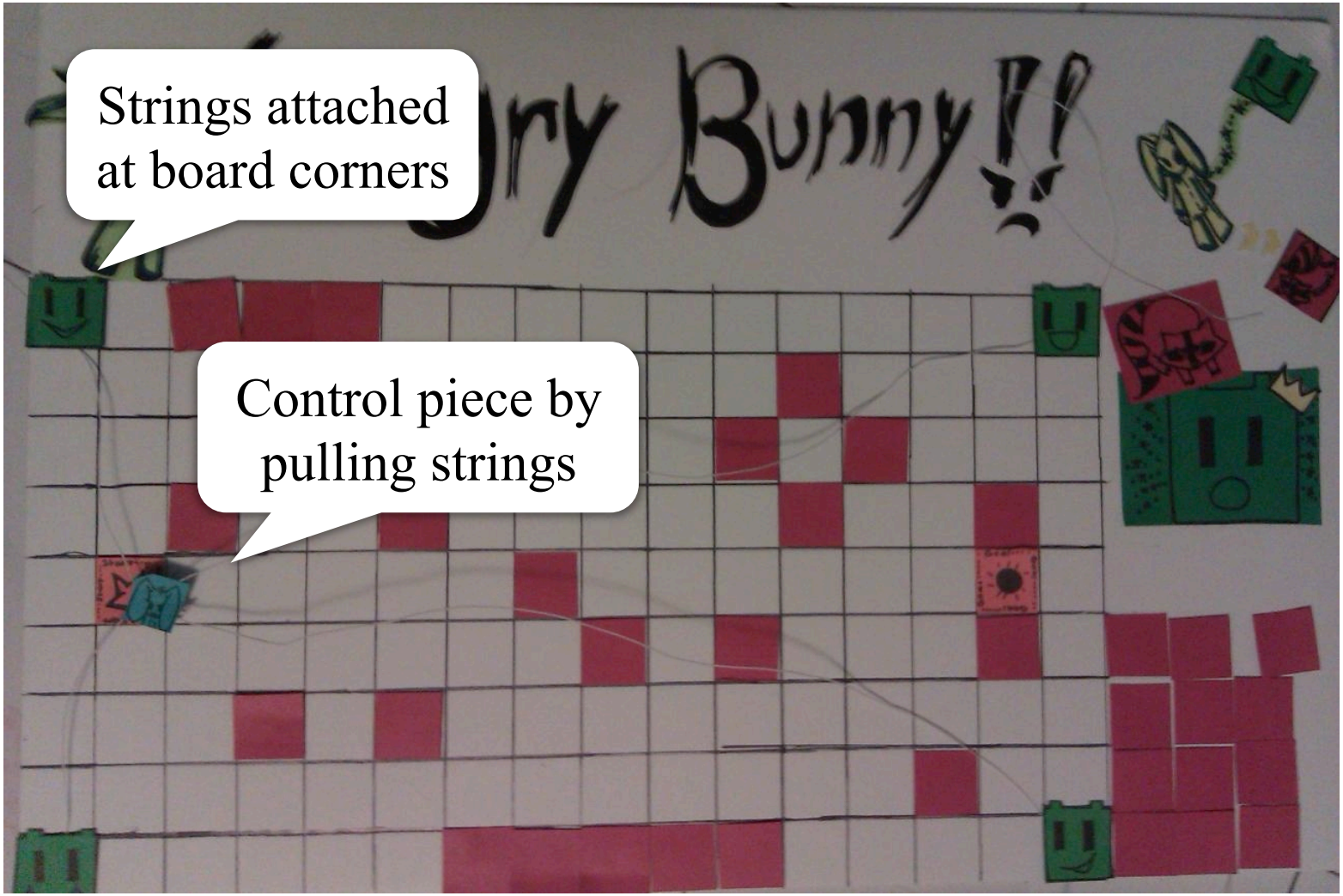


Usability Analysis

- **Unusual user-interfaces**
  - Recall that actions correspond to inputs
  - Some inputs are not simple buttons
  - Example: touch gestures, motion controls
- **Puzzle-style games**
  - Create a game with module elements (e.g. cards)
  - Laying out levels creates a new game level
  - Allows you to quickly change and test levels

Usability Testing: *Angry Bunny*

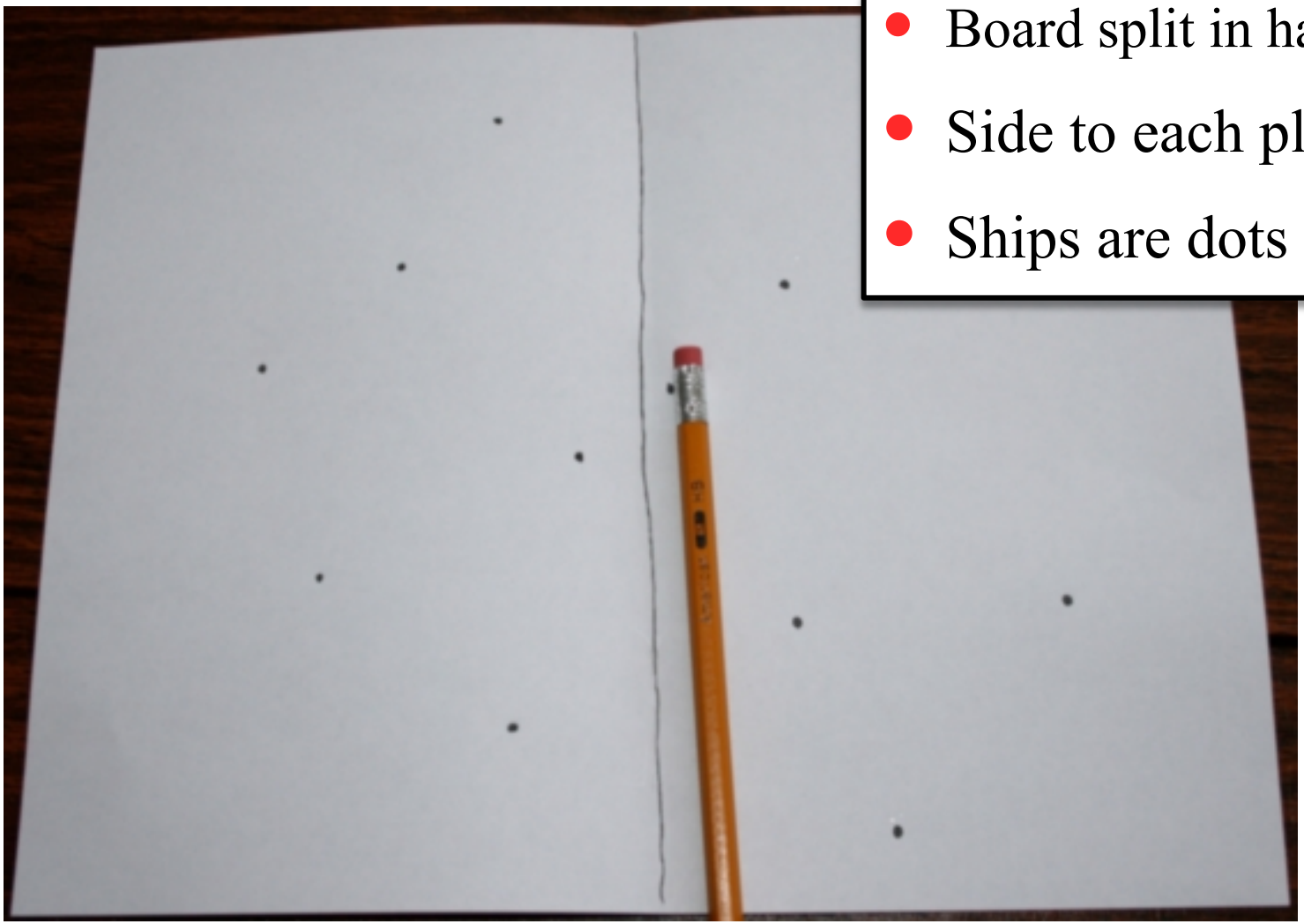
Modeling Movement Controls



Modeling Gestures

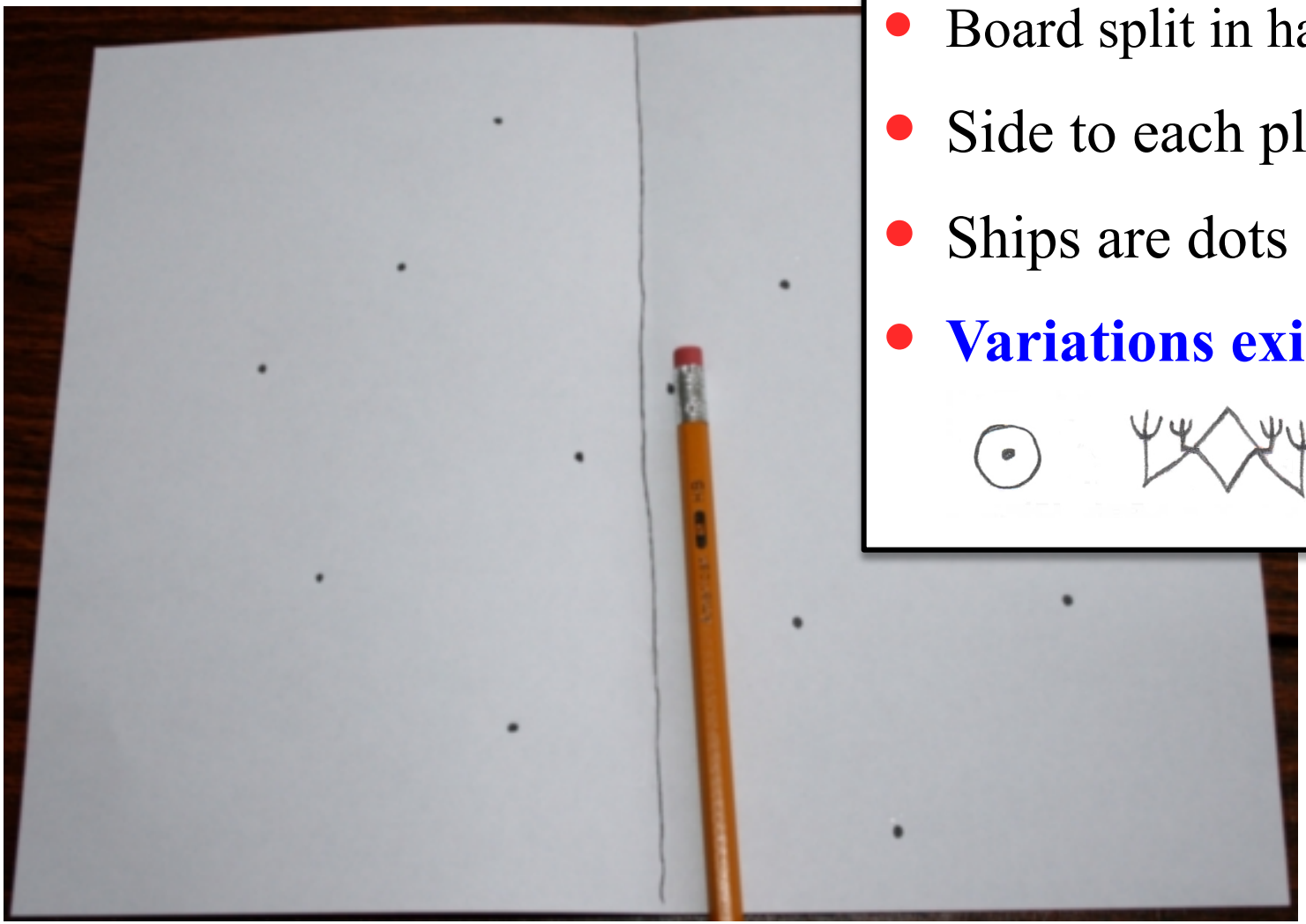
- Usability includes custom touch gestures
  - How accurate is player gesture?
  - How repeatable is the gesture?
  - How much screen does it require?
- Test out gestures with a writing tool
  - Write directly on the game board
  - Put a transparency over the game board
- Does not help with multi-touch (**solution?**)

Example: Space War



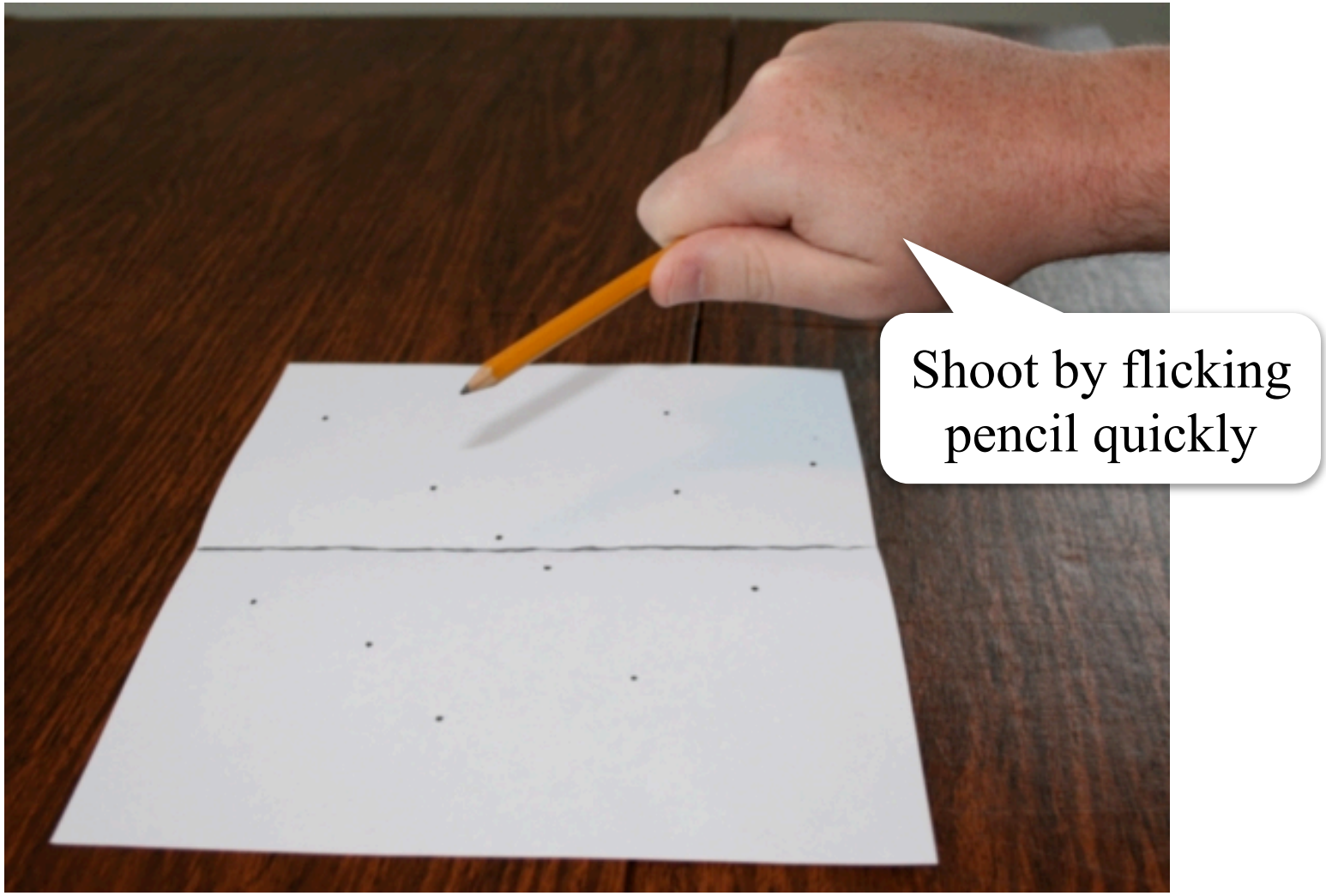
- Board split in half
- Side to each player
- Ships are dots

Example: Space War

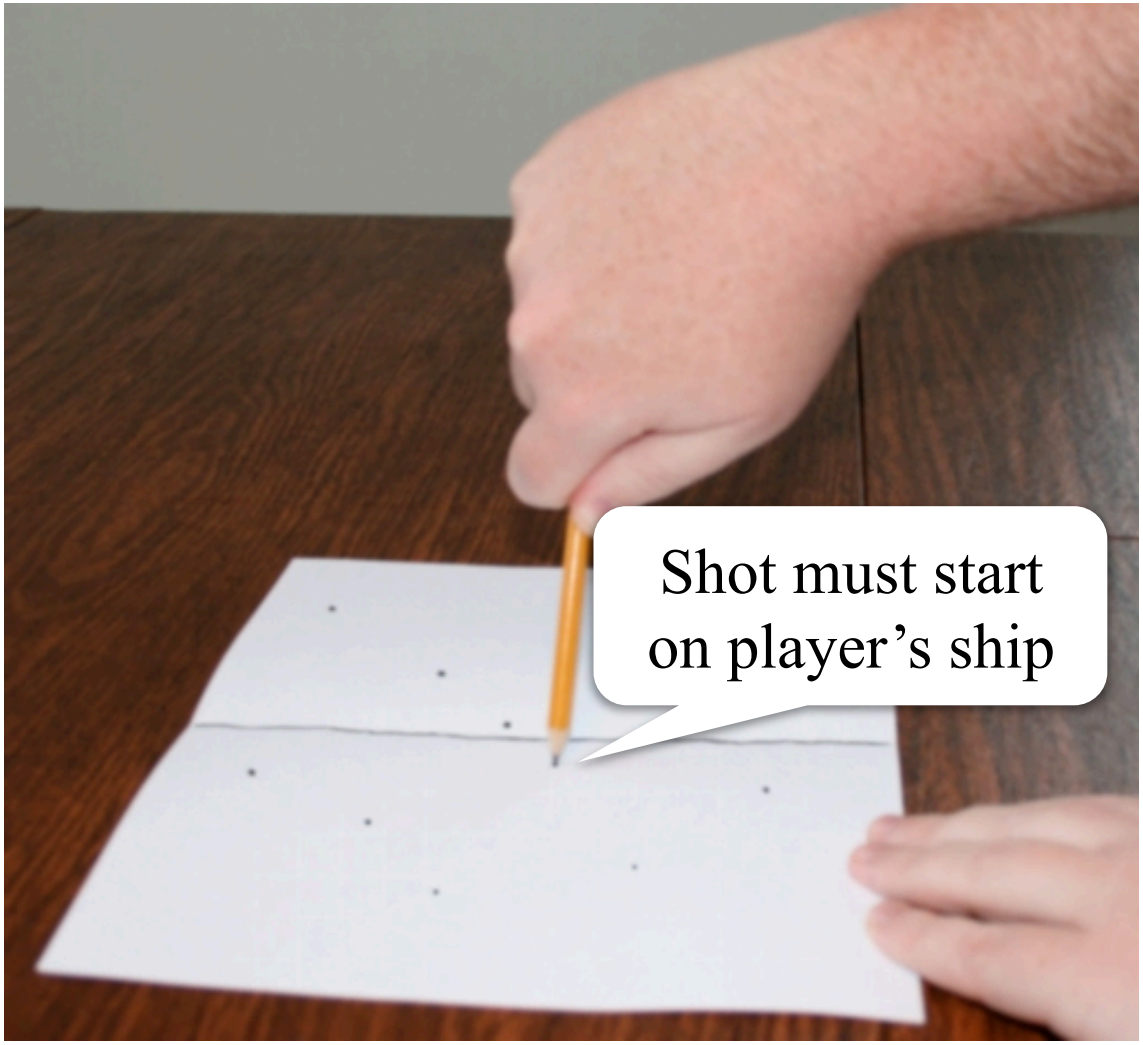


- Board split in half
- Side to each player
- Ships are dots
- **Variations exist**

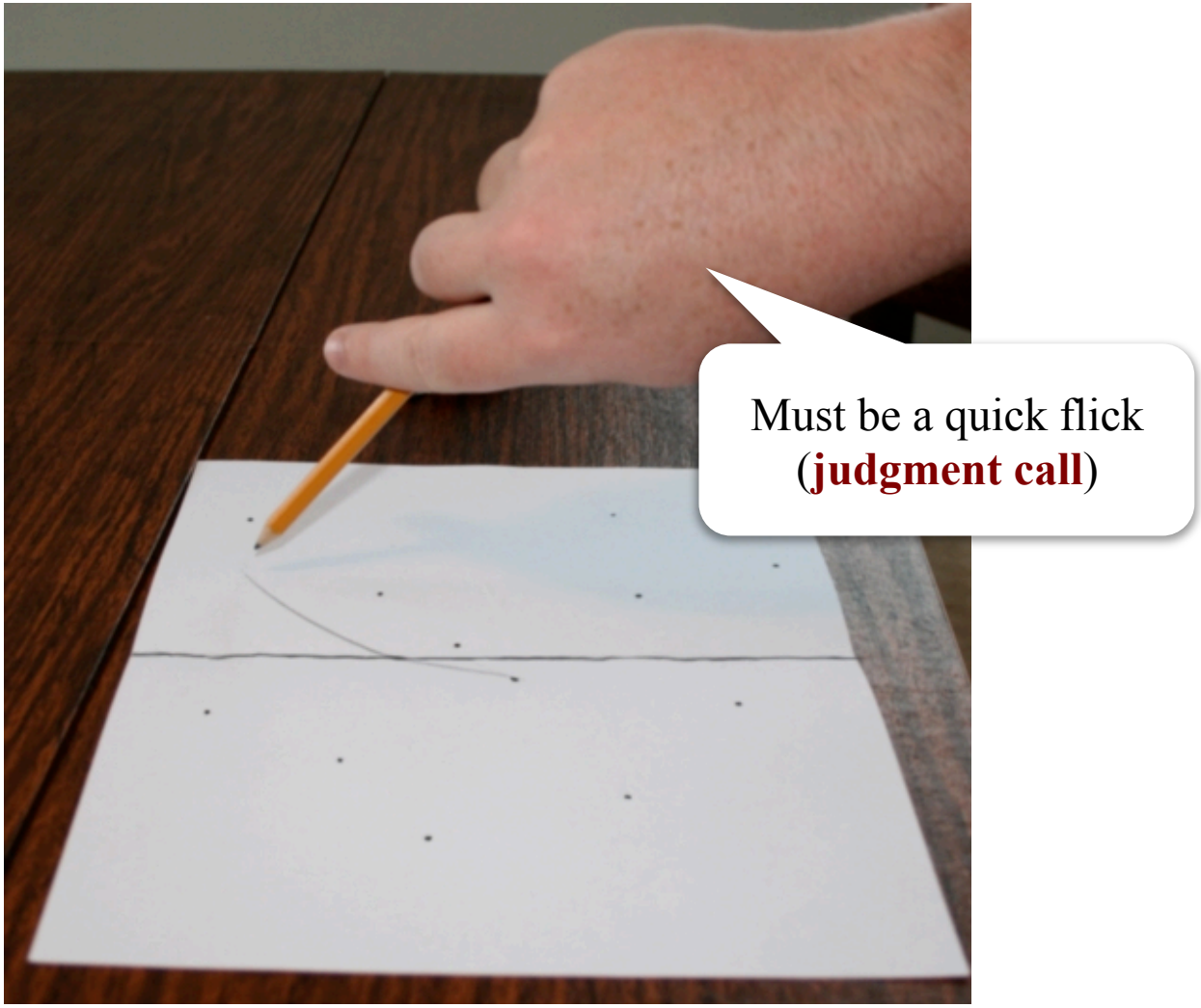
Gestures in Space War



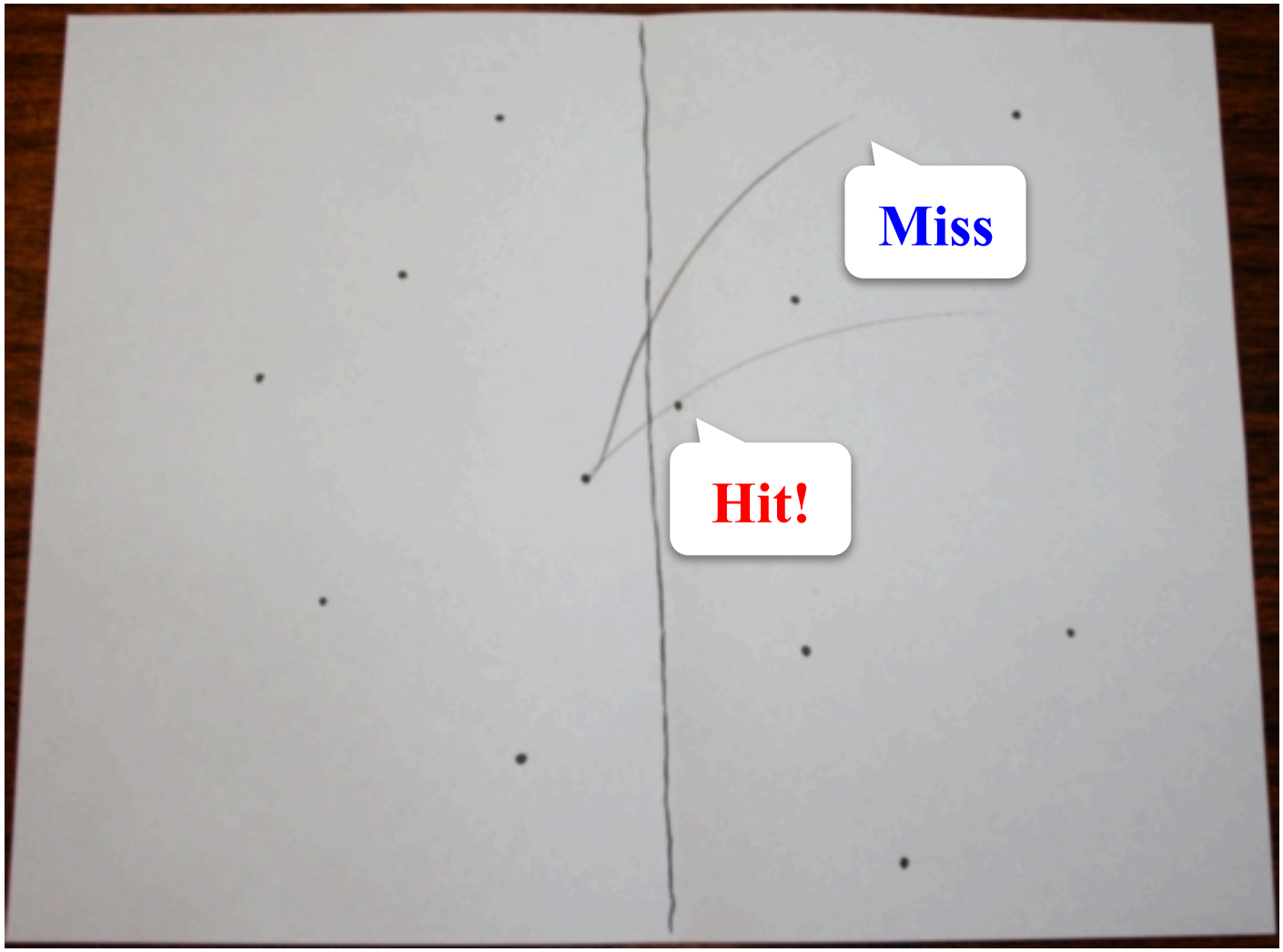
Gestures in Space War



Gestures in Space War



Processing Laser Fire



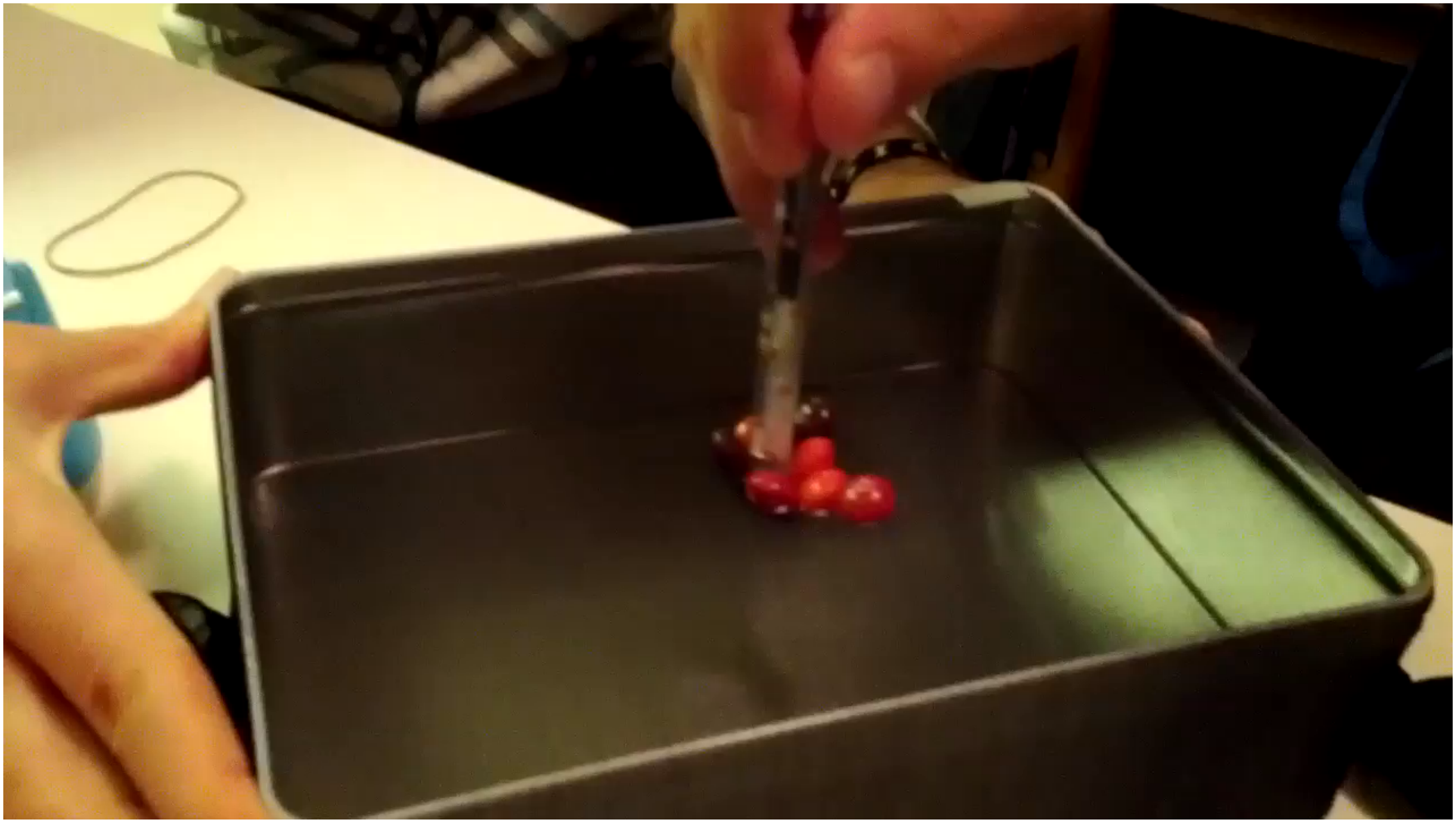
Space War Rules

- Players alternate turns shooting
  - **Remember**: Must start at active ship
  - Friendly fire usually ignored
  - Variations allow limited ship movement
- Successful hit destroys a ship
  - Variations may need multiple hits
- Continue until one side has no ships
  - Or paper is too messy to play anymore

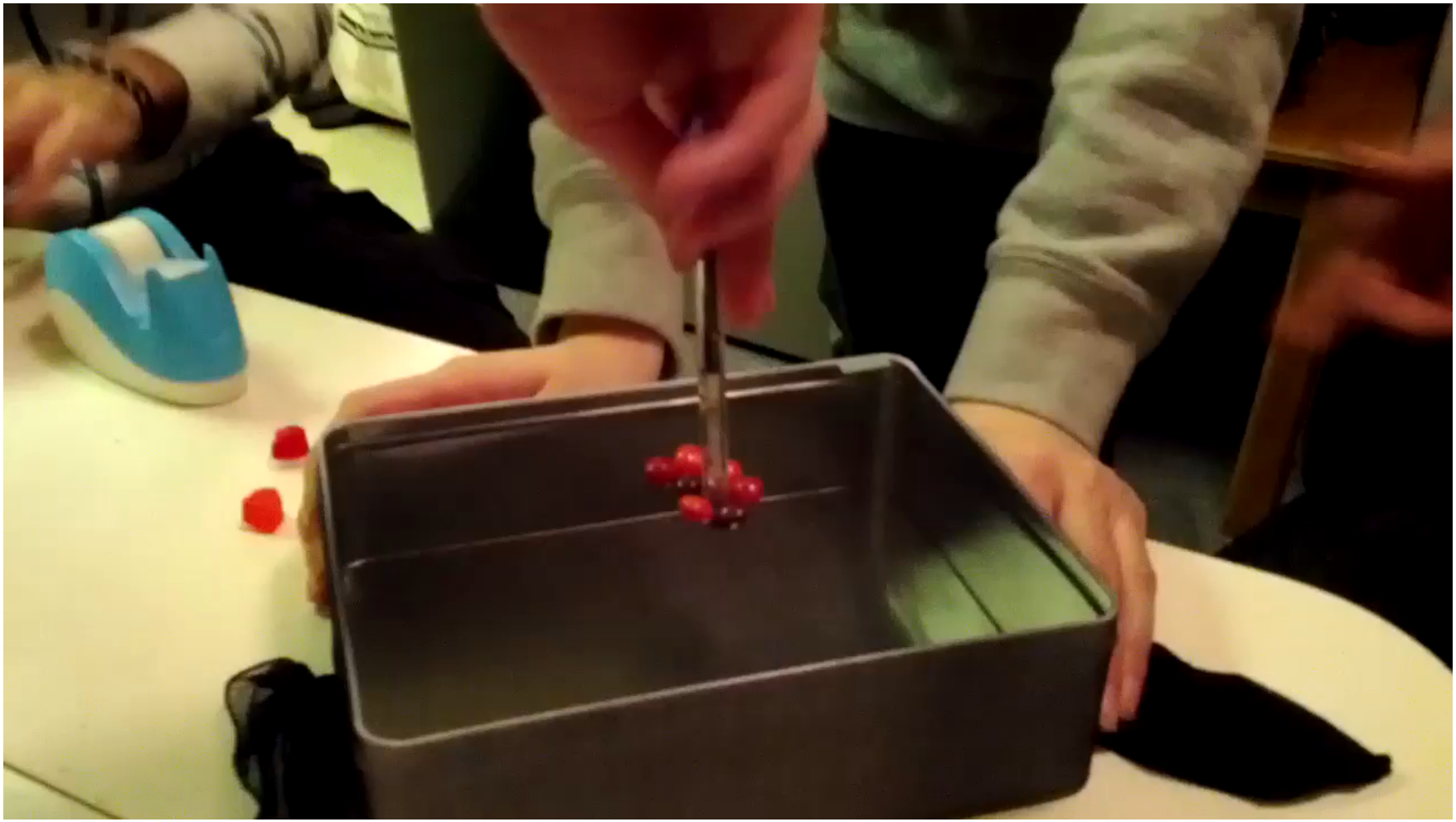
Experiential Prototypes

- Some prototypes do not test gameplay
  - They test an experience or feeling
  - You determine if the feeling is enjoyable
  - Then go back and design gameplay for that
- Be very *careful* with this!
  - A very advanced design technique
  - Can easily end up with worthless prototype
  - Have only seen a few successes at this

Experiential Prototype: *Aeronautical*



The Experience of Threat



Discussion