CS/INFO 4154: Analytics-driven Game Design

Class 2:

Mechanics and Brainstorming
Eventually…

Pyrokid, 2014
Goal of Paper Prototyping

- Evaluate whether the idea has potential
- Implement the core of the idea
- Do the minimum possible to test it

Pyrokid, 2014
What is a game?
a closed, formal system that engages players in structured conflict and resolves its uncertainty in an unequal outcome

(Game Design Workshop)
Karen Salen and Eric Zimmerman

a system in which players engage in artificial conflict, defined by rules, that results in a quantifiable outcome

(Rules of Play)
Sid Meier

a series of 

interesting decisions

(GDC 2012)
Common Threads

- Rules
- Conflict
- Decisions
Common Threads

- Rules
- Conflict
- Decisions
Rules

Game Mechanics

Actions

Interactions
Actions

- **Verbs** that describe what the player can do
  - Walk
  - Run
  - Jump
  - Shoot

- Might not involve an avatar
  - Build
  - Swap
  - Rotate
What are the actions?
What are the actions?
Actions tend to map to a *single* input

- button press
- key press
- click on something
- drag something
Actions combine

\[ \text{run} + \text{jump} = \text{jump further} \]

\[ \text{shoot} + \text{slide} = \text{strafing attack} \]
Game Mechanics

Actions

Interactions
Game Mechanics

Actions

Interactions
Interactions

• Things that happen *because* of an action
• Player does not have direct control
What are the interactions?
What are the interactions?
Game Mechanics

Actions

Interactions
Common Threads

- Rules
- Conflict
- Decisions
Growth in complexity
Sense of achievement
Common Threads

- Rules
- Conflict
- Decisions
What are the decisions?
Objective: Simulate

- Rules
- Conflict
- Decisions
Sometimes easy to prototype
Sometimes not...
Discretizing Space
Discretizing Time

Turns!
Why is brainstorming important?
Review: making pots

- no fame
- no fame
- lots of fame

1 hour → 10 hours → 100 hours
Which is better use of time?

make many pots

spend all your time making one awesome pot
## What are the tradeoffs?

<table>
<thead>
<tr>
<th>Fewer designs</th>
<th>More designs</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Spend more time per design</td>
<td>• Explore more</td>
</tr>
<tr>
<td>• Avoid duplication of effort</td>
<td>• First idea maybe not the best</td>
</tr>
<tr>
<td>• Reach consensus faster</td>
<td>• Play off each other’s ideas</td>
</tr>
</tbody>
</table>

The hypothesis

Source: David Bayles, Ted Orland (2001)
Art & Fear: Observations on the Perils (and Rewards) of Artmaking
Reality

Source: David Bayles, Ted Orland (2001)
Art & Fear: Observations on the Perils (and Rewards) of Artmaking
Larger-scale experiment

“Parallel prototyping leads to better design results, more divergence, and increased self-efficacy”

Steven P Dow, Alana Glassco, Jonathan Kass, Melissa Schwarz, Daniel L Schwartz, Scott R Klemmer

CHI 2011
Scenario 1

Dow et al. CHI 2011
Scenario 1: Share One

Meeting Room

Final Design  Final Design

Dow et al. CHI 2011
Scenario 2

- Design 1
- Best Design
- Design 3

- Design 1
- Best Design
- Design 3

Dow et al. CHI 2011
Scenario 2: Share Best

Meeting Room

Final Design

Final Design

Dow et al. CHI 2011
Scenario 3

Design 1

Design 2

Design 3

Dow et al. CHI 2011
Scenario 3

Design 1

Design 2

Design 3

Dow et al. CHI 2011
Scenario 3: Share Multiple Designs

Meeting Room

Design 1
Final Design
Design 3

Design 1
Final Design
Design 3

Dow et al. CHI 2011
Large-scale evaluation

Wear the ribbon and remember. FACE AIDS

Dow et al. CHI 2011
Which did the best?

Share One

Share Best

Share Multiple

Dow et al. CHI 2011
Effect of sharing multiple designs

+5%  +15%  +25%  +35%  +45%

Dow et al. CHI 2011
Clicks per million impressions

Dow et al. CHI 2011
1 tip of good design:

Improve your design by 25% by simply using this one weird tip.
Why is *testing* prototypes important?

- **Question**: should you spend time *making* or *testing*?
Egg drop

Dow et al. CHI 2011
Experimental Conditions

Iterative group
- Design
- Test
- Design
- Test

Non-iterative group
- Design
Some of the products

Dow et al. CHI 2011
<table>
<thead>
<tr>
<th>worse</th>
<th>same</th>
<th>better</th>
</tr>
</thead>
</table>

Dow et al. CHI 2011
Effect of iteration

+25%  +50%  +75%  +100%  +125%
Maximum height

- Iterative: 6
- Non-iterative: 3
Functional fixedness

The Candle Problem (Karl Duncker)
Functional fixedness

The Candle Problem (Karl Duncker)
Key Lesson of this Class #1

Generating, *sharing*, and *testing* multiple ideas leads to *better outcomes*

Ideas are valuable *even if not used*

Take next week seriously!
Brainstorming Technique

- Focus
- **Limit the amount of time**
- Appoint a scribe who will write down ideas
- **Positive phase**
  - Only write down new ideas! Don’t criticize any suggestion.
- **Negative phase**
  - Discuss each idea and reject as a group
- Repeat if necessary
  - But take a break!
  - If done correctly, you will be exhausted.
Mon

8/28
In-class Brainstorming

Wed

8/30
Paper Prototyping 1

Fri

8/25
Mechanics and Prototyping

9/1
Paper Prototyping 2

Attendance will be taken
Assignments 2 & 3: Paper Prototypes

- NOT GRADED!
- Will have Monday’s class to work on this
- Prototype #1
  - due Wed 8/30 (11:00am)
  - (submit a picture)
- Prototype #2
  - due Fri 8/1 (11:00am)
  - (submit a picture)

Zombify, 2014
Game: Video Game Charades

- Topic #1: emotions
- Topic #2: video game problems
Game: Video Game Charades

Actor
Topic 1: emotions

A
Topic 1: emotions
Topic 2: video game problems
Topic 2: video game problems