Class 9:

Progressions
Review: *discoverable situations*

- *Impossible to pass* without experiencing interaction
- *Isolated* from other actions and interactions
- Player is relatively *safe*

*Braid* (2008)
Now: *progress through mechanics*

I haven't talked to anyone lately, but at least I can solve my own problems.

*The Company of Myself* (2009)
Outline

1. Flow and units of challenge
2. Gantt charts
3. Case study
4. Progression metrics
5. Learning pathways
6. Group activity
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Flow
Flow State

- **Intense and focused concentration** on what one is doing in the present moment
- Loss of reflective self-consciousness
- A sense that one can control one’s actions
- Distortion of temporal experience
- Experience of the activity as intrinsically rewarding

Nakamura and Csikszentmihalyi 2001
Conditions for Flow

- Perceived challenges, or opportunities for action, that stretch *(neither overmatching nor underutilizing)* existing skills
- **Clear proximal goals** and **immediate feedback** about the progress that is being made

Nakamura and Csikszentmihalyi 2001
Flow: Ideal situation

- Difficulty
- Anxiety
- Skill
- Boredom
Challenge: manage complexity

- Systematically and gradually introduce mechanics
- This is called a progression
Units of Challenge: Design Patterns

Platformer: Jump

- Help player to recognize situations and apply learned skills
- Often inspired by game genre
- Ultimately, specific to your game design

Stealth Game: Avoidance

- Avoid Detection

Diagram:
- Tricky Jump
- Avoid Detection
Robot Unicorn Attack

Challenges:
A = jump  B = dash
Robot Unicorn Attack
Robot Unicorn Attack Progression

Challenges:

A = jump  B = dash

| A | A | A | A | B | A | A | A | A | B |

Time
Outline

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Gantt Chart

- Generally used for project planning
- We will use them to analyze and plan progressions
Robot Unicorn Attack Gantt Chart

- Challenge: dash, jump
- Time
Portal 2 Gantt Chart

Source: Piotr Bugno
https://www.behance.net/gallery/4434779/Portal-2-timelines
This tends not to happen
This tends not to happen

<table>
<thead>
<tr>
<th>Challenge</th>
<th>Task</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mechanic 3</td>
<td></td>
</tr>
<tr>
<td>Mechanic 2</td>
<td></td>
</tr>
<tr>
<td>Mechanic 1</td>
<td></td>
</tr>
</tbody>
</table>
More likely

Task

Mechanic 1

Mechanic 2

Mechanic 3
Ideal?

Challenge

Mechanic 3

Mechanic 2

Mechanic 1

Task
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Action: move left and right

My attention is stolen by a green square on the other end of the room. I want to be its friend more than anything that I've ever wanted. I decide to use the Arrow Keys to approach it.

The Company of Myself (2009)
Up close, I can see that the green square is actually a door. I think that we can be friends anyway. I decide to push the Spacebar, to move to the next room.

The Company of Myself (2009)
Spotting a couple of platforms ahead, I decide to use the Up Arrow Key to jump over them.
Interaction: death

I remember that the R key will let me reset the current level to try again.

The Company of Myself (2009)
Action: restart

I remember that the R key will let me reset the current level to try again.

The Company of Myself (2009)
I begin to wonder what would happen if I pressed the Spacebar before I completed a level.

The Company of Myself (2009)
Interaction: stand on clone

I begin to wonder what would happen if I pressed the Spacebar before I completed a level.

The Company of Myself (2009)
5-10 min: pair activity

Make a Gantt Chart for *In the Company of Myself*

http://www.kongregate.com/games/2DArray/the-company-of-myself
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What metrics define a progression?

Mechanic 1

Mechanic 2

Mechanic 3
Learning Pace
Learning Pace

- How frequently to introduce new mechanics?

\[
\frac{\text{# of mechanics}}{\text{# of tasks}}
\]
**Portal 2 Pace**

61 levels

28 mechanics

\[
\text{pace} = \frac{\text{# of mechanics}}{\text{# of tasks}} = \frac{28}{61} = 0.46 \text{ mechanics/task}
\]
Reinforcement & Recombination

New Mechanics
Reinforcement

• How long to “dwell” on a mechanic before introducing a new one?

Challenges:

A = jump         B = dash

A B  vs.  A A A A B
Recombination

- How often to combine mechanics with other mechanics?

**Challenges:**

- A = jump
- B = dash
- C = shoot fireball

A B C vs. A AB ABC
Comparing progressions

Reinforcement

Recombination
Pair activity: compare progressions

Reinforcement

Recombination

A, A, A, B, B, B
A, A, B, B, AB, AB
A, B, C, D, E, F
A, AB, ABC, ABCD, ABCDE
A, A, A, B, B, B

Reinforcement

A, A, A, B, B, B

Recombination
Reinforcement

A, A, A, A, B, B, B

Recombination

A, A, B, B, AB, AB

A, A, B, B, AB, AB

A, A, B, C, D, E

A, A, B, ABC, ABCDE

A, AB, ABC, ABCD, ABCDE
Robot Unicorn Attack Progression

**Challenges:**

A = jump         B = dash

A A A B A A AB

High reinforcement, low recombination
Hello Worlds

**Challenges:**
A = move  B = two worlds  C = close world
MOUNTAINSIDE

TIME: 0
PAR TIME: 60
SPEED TIME: 26

COINS: 0/12
STARS: 9
POINTS: 879
Hello Worlds

Challenges:
A = move     B = two worlds     C = close world

A  AB  AB  ABC  ABC

Moderate reinforcement, high recombination
What’s the best?

- No correct answer
- Enough reinforcement to internalize mechanics
- Enough recombination to make challenges interesting
Aside: progressions are everywhere
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How to build to a particular goal?

- Consider pathways through the mechanic combination space

I haven't talked to anyone lately, but at least I can solve my own problems.
Level 1
Level 2
Now that risk is involved, jumping on platforms doesn't seem as easy to me.
Level 4
Level 5

I haven't talked to anyone lately, but at least I can solve my own problems.
Which is harder?

Level 1

Level 2

Design Patterns
Which is harder?

Level 2

Level 3

Design Patterns
Which is harder?

Level 3

Level 4

Design Patterns
Which is harder?

Level 4

Level 5

I haven't talked to anyone lately, but at least I can solve my own problems.

Design Patterns
Which is harder?

Level 3

Level 5

I haven't talked to anyone lately, but at least I can solve my own problems.

Design Patterns
TCOM Skill Tree

1.

2.

3.

4.

5.
Two promising learning pathways

1. move → complex jumps → clone and jump → clone and complex jumps
2. move → clone and jump → complex jumps → clone and complex jumps
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Group activity: plan your tasks

Step 1. Plan a Gantt Chart for your game
Step 2. Sketch what the levels might be
Summary: Learnability

9/10
Nobody Reads and
Nobody Listens

9/12
Discoverability

9/14
Progressions
Review: tutorials not always good

- **Foldit**
  - No Tutorial: 4
  - Tutorial: 7

- **Refraction**
  - No Tutorial: 15
  - Tutorial: 15

- **Hello Worlds**
  - No Tutorial: 10
  - Tutorial: 10
Review: design for discoverability

Super Mario Bros. (1985)
Review: progress through mechanics

I haven't talked to anyone lately, but at least I can solve my own problems.

The Company of Myself (2009)
Monday: Playtesting and Bias