Lecture 1:

Overview
Promise

• Why should you take this class?
• What is this class?
• How will you be evaluated?
• What are the first assignments?
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Why should you take this class?

- You get to make a game!
- You will interact with the world, not just Cornell
- Releasing your game is fun, intense, and memorable
- “Big data” is a key buzzword these days
- Employers want data analysis skills
Previous successful games
Chromatic
Chromatic

100,000 plays
Hello Worlds!

Introduction
Hello Worlds!

Introduction
Hello Worlds!

1.5 million plays
External Reviews!

Chromatic

Rating: 4/5 (67 votes)

Platform: Flash

Categories: arkeus, browser, flash, flixel, free, game, hiddendificulty, linux, mac, platform, puzzle, rating-3, skill, windows

Warning: Chromatic is not friendly to those who suffer from color-blindness. If you have difficulty distinguishing between certain colors, you may want to skip this title.

You know what? There are just times when you need to go mellow. You know what I mean. Soft colors, round edges, smooth beats. That’s what I’m talking about, something to just lean back and let all the tension just wash away from you. And this is exactly what Arkeus’ platformer Chromatic would be if, you know, it wasn’t also completely finger burning, brain breaking, throw your laptop against the wall insane. Aside from that part of it, it’s totally relaxing.

The goal in this skill intensive puzzle platformer is to nab as many coins as you can and then make it to the exit in the shortest time possible. As you might have guessed, there’s a twist. Actually, there are lots of twists, and all of them have to do with, you guessed it, color. As in most platformers, you move using the [arrow] keys, with an option to jump using the [space] bar, and stroke [V] to do a horizontal dash. But you can also change your chromatic blob of goo’s color by hitting [Z] to turn red, [X] to turn blue, and [C] to turn yellow. Each color has a certain advantage; red moves faster and can dash for longer distances, blue can wall jump and slide slowly down walls, and yellow can double jump.
External Reviews!

Hello Worlds!

Rating: 4.7/5 (220 votes)

Platform: Flash

Categories: browser, flash, fixed, free, game, linux, mac, platform, puzzle, rating-2, windows

If you’re like me, you’re what people might call “unpleasant” in the morning when they were feeling charitable, and “My face, my face, you bit my face” when... not. People like you and I need to take a lesson from the world little mechanical spider protagonist fella of this puzzle-platformer and instead spring out of bed with a cheery “Hello Worlds!” Yes, sir, then we’d be ready for a good, honest day’s work of standing on ledges in parallel dimensions, combining worlds, and collecting coins to open floating crayon doors, just like your grandpappy used to do... no... well, not mine, but someone’s grandpappy, surely?

Each stage consists of several screens placed next to each other, each containing a copy of your protagonist that moves in unison with the others. The goal is simply to reach the exit of each level; move with [WASD] or the [arrow] keys, and open doors with the [spacebar]. Easy-peasy? The problem is that an obstacle in one screen will affect all of them; you won’t be able to proceed, for instance, if a wall is in your way in one screen even if the others are clear. You can, however, use this to your advantage; standing on a ledge in one screen will let you reach places that might have previously been too high in others. You can press [C] to overlap all the screens so you can see how to proceed (although you can’t move while you’re doing this), and holding [V] will rewind a chunk of your time, while [R] will reset the whole level. And of course, you’ll get a higher score (and more
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What is this class?

analytics-driven game design
What is this class?

analytics-driven game design
What is analytics?

Wikipedia: “the discovery and communication of meaningful patterns in data”
Heat Maps: Halo 3
Heat Maps: Halo 3
What is this class?

analytics-driven game design
What is this class?

analytics-driven game design
Game Design Workflow

the world

game designers

game

playtesters

Introduction
Microsoft In-house Playtesting
Game Design Workflow

the world

data

game

playtesters

game designers

Introduction
League of Legends Win Rates

Introduction
What is “big data”? 

- **Officially:**
  Datasets that are so large that they cannot be processed by traditional methods

- **Unofficially:**
  Large amounts of data, and the ways this data can be used
A/B Testing

The world

Game designers

Version A

Version B

Data
Metrics

- Progress
- Time played
- Return rate
- Revenue
GSN Games A/B Testing
GSN Games A/B Testing
GSN Games A/B Testing
GSN Games A/B Testing

Revenue +12.3%
Bounce Rate -25.8%
GSN Games A/B Testing

Revenue +11%
Zynga A/B Testing
Other examples of A/B testing?
4 Experiments

Foldit
Hello Worlds
Refraction
Experiment #1: Audio
Engagement...

A) increased
B) decreased
C) increased AND decreased
D) didn’t change
Engagement...

A) increased
B) decreased
C) increased AND decreased
D) didn’t change
Experiment #2: Animations
Engagement...

A) increased
B) decreased
C) increased AND decreased
D) didn’t change
Engagement...

A) increased
B) decreased
C) increased AND decreased
D) didn’t change
Experiment #3: Secondary Objectives
Engagement...

A) increased
B) decreased
C) increased AND decreased
D) didn’t change
Engagement...

A) increased  
B) decreased  
C) increased AND decreased  
D) didn’t change
Experiment 4: Tutorials

Click on the laser bender to pick it up.
Engagement...

A) increased
B) decreased
C) increased AND decreased
D) didn’t change
Engagement...

A) increased
B) decreased
C) increased AND decreased
D) didn’t change
Key point

analytics is important and changing the game industry
What is this class?

analytics-driven game design
What is this class?

analytics-driven game design
Game Design

- Single semester-long game project
  - Interdisciplinary teams of 5-6 people
  - Game design is up to you!
Three phases

- **Pre-production**
  - Brainstorming
  - Paper prototyping
  - Writing design document

- **Development**
  - Programming
  - Playtesting
  - Logging

- **Iterative Refinement**
  - Releases
  - Data analysis
  - A/B testing
Logging

gdiac.cs.cornell.edu
• Spam your family and friends!
Release 2: Newgrounds
Release 3: Kongregate

Introduction
The Internet is cruel...

kristus 52
Sep. 17, 2010

This "loading" all the time sucks

IronChefGriffin 1
Sep. 17, 2010

Under rating threshold (hide)
Like electric box but not as slick or fun. Graphics are ugly and too pixelated like they were incorrectly scaled. Also, constant loading sucks 1/5

crypto1337 34
Sep. 17, 2010

Under rating threshold (hide)
there you ARE! that infamous unbeatable level! i knew id find you. 3/5 for that. tsk tsk. shitty dev should know better.
… but occasionally rewarding

i hope you're happy.......you made a game soo good i ignored my important english paper all day just to play it....... I hope you're proud of yourself :p 5/5
Course Structure

• **Lectures**: Tuesdays, Thursdays
  • Of general design and development interest
  • Slides posted on website (but likely *incomplete*!)

• Your group will need to meet outside of class

• My office hours: Tuesday/Thursday 2-3pm
  Gates 445

• TA: Josh Freeberg
Course Website

- Syllabus information is here
- Should be up-to-date within a 2-week horizon
- Ask me if it’s further in the future
Project Groups

• This is a **group-oriented** course
  • 5-6 person teams of diverse talents
  • At least one visual designer/artist

• Groups are assigned by the staff
  • Taking your preferences into account
  • Assignments complete by this week
Game Requirements

• Must be…
  • Fun
    • Your grade depends on how much people like it!
  • Novel
    • Cannot be a clone of an existing game
  • Feasible in one semester
    • Avoid full RPGs and real-time strategy games
    • Game can have elements of these
  • Single-player
    • Networking for multiplayer is too painful
Game Requirements

- **All** programmers must work in Flash/AS3
  - Very easy to pick up if you know Java
- FlashDevelop is a great free IDE
- Phillips 318 has Adobe Flash Builder 4
- See website for help and resources
Intellectual Property

• Your **group** retains all ownership
  • You can commercialize it later
  • You can make derivative works
  • Individual ownership is your responsibility

• But Cornell gets a non-exclusive license
  • Non-commercial use of final version submitted
  • We can post this version on our website
  • We claim no other rights to your game
In-class presentations

- Project pitches (next Thursday)
- Paper prototyping postmortem
- Playtesting postmortem
- Release postmortems
Assignments

- **Individual**
  - Basic programming / art lab
  - Data analysis lab
  - Two-week reports

- **Group**
  - Paper prototype
  - Design document
This course is a lot of work!

- Expect at least 10 hours/week
- Releases are particularly intense
  - Players come in a burst
  - If something goes wrong, you must deal with it immediately
## Semester Schedule

<table>
<thead>
<tr>
<th>Week</th>
<th>Task</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Form Groups</td>
<td>8/24</td>
</tr>
<tr>
<td>2</td>
<td>Group Charter</td>
<td>8/31</td>
</tr>
<tr>
<td>3</td>
<td>Paper Prototyping</td>
<td>9/7</td>
</tr>
<tr>
<td>4</td>
<td>Design Document</td>
<td>9/14</td>
</tr>
<tr>
<td>5</td>
<td>Programming</td>
<td>9/21</td>
</tr>
<tr>
<td>6</td>
<td>First Prototype</td>
<td>9/28</td>
</tr>
<tr>
<td>7</td>
<td>Playtesting</td>
<td>10/5</td>
</tr>
<tr>
<td>8</td>
<td>Second Prototype</td>
<td>10/12</td>
</tr>
<tr>
<td>9</td>
<td>Logging</td>
<td>10/19</td>
</tr>
</tbody>
</table>

### Pre-Production

### Development
## Semester Schedule

<table>
<thead>
<tr>
<th>Week</th>
<th>Activity</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>Friends Release</td>
<td>10/26</td>
</tr>
<tr>
<td>11</td>
<td>A/B Testing</td>
<td>11/2</td>
</tr>
<tr>
<td>12</td>
<td>Newgrounds Release</td>
<td>11/9</td>
</tr>
<tr>
<td>13</td>
<td>Data Analysis</td>
<td>11/16</td>
</tr>
<tr>
<td>14</td>
<td>Prep, Thanksgiving</td>
<td>11/23</td>
</tr>
<tr>
<td>15</td>
<td>Kongregate Release</td>
<td>11/30</td>
</tr>
<tr>
<td>16</td>
<td>Final Presentations</td>
<td>12/?</td>
</tr>
</tbody>
</table>
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Grading Policy

- Mixture of **group** and **individual** grades

- Group grades are same for all group members
  - Group game grade (25%)
  - Group assignments (15%)
  - Class presentations (10%)

- Individual grades distinguish group members
  - Individual game grade (25%)
  - Individual assignments (15%)
  - Class participation (10%)
# Game Grade

- Group grade reflects the game quality

<table>
<thead>
<tr>
<th>Grade</th>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Successful and fun</td>
</tr>
<tr>
<td>B</td>
<td>Complete and playable</td>
</tr>
<tr>
<td>C</td>
<td>Complete but unplayable</td>
</tr>
<tr>
<td>D/F</td>
<td>Not complete; bad issues</td>
</tr>
</tbody>
</table>

- Individual grade represents contribution

<table>
<thead>
<tr>
<th>Grade</th>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt; Group</td>
<td>Visionary, group MVP</td>
</tr>
<tr>
<td>= Group</td>
<td>Good attitude, hard worker</td>
</tr>
<tr>
<td>&lt; Group</td>
<td>Produce negative work</td>
</tr>
<tr>
<td>D/F</td>
<td>Abandon the group</td>
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key information about you and your preferences
Assignment 1

- Your name, NetID, year, and college
- Your five favorite video games
- What role you wish to have in this course
- A description of your expertise in this role
- A description of any additional expertise
- A description of what type of game you want to work on
- A list of the people you wish to work with
- Any other information you would like us to consider
Assignment 1

• Due: TOMORROW, Aug. 27th, 11:59pm via CMS
Assignment 2: Programmers

Implement Pong in AS3
FlashDevelop

Introduction
package yourgame {

    public class YourClass extends OtherClass {

        private var x:int;

        public YourClass(input:int) {
            x = process(input);
        }

        public override function process(y:int):int {
            return y;
        }
    }
}

Introduction
package yourgame {

    public class YourClass extends Sprite {

        public YourClass() {
            addEventListener(MouseEvent.CLICK, move);
        }

        public function move(e:MouseEvent):void {
            x = x + 10;
        }
    }
}
Assignment 2: Designers

Draw and animate a character
Assignment 2

• Due: NEXT TUESDAY, Sep. 2\textsuperscript{nd}, 11:59pm via CMS
If you think this is hard…
Coming soon…

- Thursday: More about Flash and game design
- Next Tuesday: Game mechanics
- Next Thursday: Project Pitches
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