Data Analysis for Game Development

Administrative

IMGD 2905
Outline

• Background
• Admin Stuff
• Motivation
• Objectives
Professor Background
(Who am I?)

• Mark Claypool (professor, “Mark”)
  – Professor, Computer Science
  – Director, Interactive Media and Game Development

• Research interests
  – Multimedia performance
  – Congestion control (protocols, AQM)
  – Wireless networking
  – Network games

• Currently playing
Student Background
(Who are you?) 1 of 2

1. Year?
2. Major?
   a. IMGD Art or Tech
   b. Other
3. Background?
   a. Statistics
   b. Probability
4. **Tools?**
   a. Python
   b. Excel

5. **Platform of Choice?**
   a. Windows
   b. Linux
   c. Mac
Online Classes

• Meet during regular time slot
  – Zoom
• Ask questions, provide updates, ...
• Lectures, but in small chunks
• Group work (Zoom breakout rooms)
• ...
• Let’s be flexible! We’ll see how this goes, what’s going well, what is not and adjust!
**Syllabus Stuff**

- [www.cs.wpi.edu/~imgd2905/d21](http://www.cs.wpi.edu/~imgd2905/d21)
  - Linked from Canvas Web page

- **Class:** M, T, Th, F 10-10:50am
  - [https://wpi.zoom.us/j/542948614](https://wpi.zoom.us/j/542948614)

- **Office hours (Zoom):** TBA
  - Or by appointment

- **Email**
  - [claypool@cs.wpi.edu](mailto:claypool@cs.wpi.edu) (me)

- **Discord server**
  - Invite code on Canvas page
• Unfortunate name, but good content \(\rightarrow\) depth to provide foundation for analytics
• Good examples, but not game-centric
Class Topics

- Data analysis tools and pipeline
- Statistics
- Visualizing and presenting data
- Probability
- Hypothesis testing
- Regression
- Apply topics to game data!
  - Commercial and custom
Course Structure

• Prerequisites
  – College algebra
  – No \{programming, stats, probability\} expected
  – No game analytics experience required

• Grading
  – Projects (60%)
  – Homework (30%)
  – Participation (10%)
  – On the Canvas Website
Projects

• 4 projects, 60% of grade total
  – Last project slightly larger

• Do analysis on actual game data!

• Use game analytics pipeline
  – Typical flow for game (and other) analytics
  – Common tools used for analytics

• Multiple instances of analysis
  – Apply, become skilled w/methods of synthesis, interpretation, dissemination

• Project 1 – today!
Homework

- Written problem set
- From book, Web, made up
- Solve with pencil and paper
- Or calculators
- Or Excel
Participation

• Showing up to class matters
  – Come to class!

• Being engaged in class matters
  – Don’t multi-task!

• Ask questions, answer questions

• Playtesting/user studies is 2%

• 10% of your grade
  – But much bigger indirect effect!
Slides

• On the class Web page
• PowerPoint and PDF
• Caution! Don’t rely upon slides alone! Use them as supplementary material – (come to class)
Timeline

• *Tentative* timeline for dates for exams and projects
  – In order to help you plan

http://www.cs.wpi.edu/~imgd2905/d21/timeline.html

• Will notify if update
Why This Class?
Why This Class?
(1 of 2 )

Goals

• Gain proficiency using modern tools for data acquisition and analysis

• Understand basic probability and statistics as it applies to data analysis

• Develop skills for presenting game data analysis both orally and in written form
Why This Class?
(2 of 2)

Objectives

• Use spreadsheet to analyze and visualize game data
• Use scripting language to extract and clean data recorded from game
• Apply summary statistics to game data
• Compute probability distributions for game data
• Write reports with graphs and tables illustrating analysis of game data
• Present game dataset report using appropriate visual aids
Why This Class?

– Other

• WPI IMGD requirements
  – Gotta take Math/Quantitative Science

• Statistics and Probability useful for game design and development

• Game Analytics similar to other forms of analytics (e.g., Data Science)

• Fun!

• Game analysis increasingly important (jobs!)
Game Play Data Analyst, Sony Interactive Entertainment

Duties
• Advise, define implement gameplay data to ensure understanding of player experience
• Provide insights that impact game design and improve quality
• Create and maintain player segmentation that allows understanding of engagement and spending
• Mine data sets and develop dashboard for live service teams, game developers
• Devise and implement A/B experiments to test acquisition, engagement
• Present finding and provide recommendations

Requirements
• BS/BA degree Stats, Math, Econ, CS or related
• Experience with SQL
• Experience with data visualization packages
• Experience with statistical software
• Experience with Amazon cloud services
• Have created and presented visualizations and insights to various business groups
• Passion for video games preferred
Jobs

Duties
• Aggregate and analyze petabytes of game data from various sources
• Prep data for deeper analysis and/or reporting
• Organize collected data into reliable intel that informs Rioters to improve player experience
• Work with decision-makers to understand goals, identify opportunities, and inform decisions across company
• Create awesome

Requirements
• BS/BA degree Stats, Math, Econ, CS or related
  • Graduate degree preferred
• Business savvy
• Technically adept
  • SQL, Python
  • Excel, PowerPoint
• Communicator
  • Reports clear, and concise
  • Presentations to variety of audiences

Analyst,
Riot Games