

Data Analysis for Game Development

Administrative

IMGD 2905

1

Outline

- Background
- Admin Stuff
- Motivation
- Objectives

2

Professor Background (Who am I?)

- Mark Claypool (professor, “Mark”)
 - Professor
 - Computer Science
 - Interactive Media and Game Development
- Research interests
 - Multimedia performance
 - Congestion control (protocols, AQM)
 - Wireless networking
 - Network games
- Current playing
 - Overwatch
 - League of Legends
 - Mini-Metro

Data analysis!



3

Student Background (Who are you?)

- | | |
|---------------------|------------------------|
| 1. Year? | 4. Tools? |
| 2. Major? | a. Python |
| a. IMGD Art or Tech | b. Excel |
| b. Other | 5. Platform of Choice? |
| 3. Background? | a. Windows |
| a. Statistics | b. Linux |
| b. Probability | c. Mac |

4

Syllabus Stuff

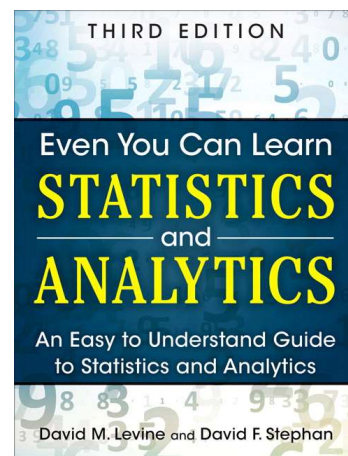
- <http://www.cs.wpi.edu/~imgd2905/d19>
 - Linked from Canvas Web page
- Class: **M, T, Th, Fr** 10-10:50am
- Office hours (FL B24):
 - (Myself and SA, TBA)
 - Or by appointment
- Email
 - claypool@cs.wpi.edu (me)
 - hmjauris@wpi.edu (Hannah Jauris, SA)
 - TBA: (class + me + SA)

5

Text Book

D.M. Levine and D.F. Stephan
 “Even You Can Learn
 Statistics and Analytics”
 3rd ed. *Pearson*, 2015

- Unfortunate name, but good content → depth to provide foundation for analytics
- Good examples, but not game-centric



6

Class Topics

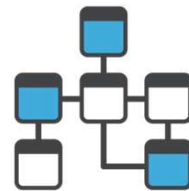
- Data analysis tools and pipeline
- Statistics
- Visualizing and presenting data
- Probability
- Hypothesis testing
- Regression
- Apply topics to game data!
 - Commercial and custom
 - New and old



7

Course Structure

- Prerequisites
 - College algebra
 - No {programming, stats, probability} expected
 - No game analytics experience required
- Grading
 - Exams (30%)
 - Projects (55%)
 - Presentation (10%)
 - Participation (5%)
 - On the Canvas Website: <https://canvas.wpi.edu/courses/13112>
 - Authenticate with WPI login and password



<http://dewbi.com/wp-content/uploads/2017/01/database-schema.png>

8

Exams



- 2 exams, 30% of grade total
 - Mid-term, Final (non-cumulative)
 - Closed-note, Closed-paper, Closed-friend
 - Generally, on material in class, but may have some parts from project
- Test mastery of concepts that may not be evident from project reports

9

Projects



- 5 projects, 55% of grade total
 - Last project slightly larger
- Do game 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 with methods of synthesis, interpretation, presentation
- “Lather, rinse, repeat”
- Project 1 – today!

10

Presentation

Presentation

- Everyone **1** presentation
- In-class, maximum **4** minutes long total
 - Leave time for critique
- Content drawn from projects
- When? ~1 person per class
 - Assigned at random
 - Stay tuned for schedule

Peer-critique

- Feedback to become better presenters!
- *Everyone* will provide for *every* presenter
 - Short, paper form
- Presenter will review
 - Turn in short, written reflection
 - Reflection due 1 week after presentation

10% of grade

11

Participation

- Showing up to class matters
 - Come to class!
- Being engaged in class matters
 - Put down your phone/laptop!
- Ask questions, answer questions
- **5%** of your grade
 - But much bigger indirect effect!



12

Slides

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



<https://cdn4.iconfinder.com/data/icons/documents-letters-and-stationery/400/doc-18-512.png>

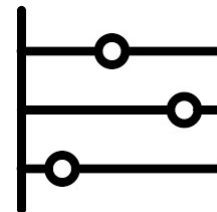
13

Timeline

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

<http://www.cs.wpi.edu/~imgd2905/d19/timeline.html>

- Will notify if update



14

Why This Class?

15

Why This Class?

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

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

16

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!)

17

Jobs

Game Play Data Analyst, Sony Interactive Entertainment



- | | |
|--|--|
| <ul style="list-style-type: none"> • Duties <ul style="list-style-type: none"> – 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 | <ul style="list-style-type: none"> • Requirements <ul style="list-style-type: none"> – 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 |
|--|--|

18

Jobs

Analyst, Riot Games



- **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