

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
 - Interactive Media and Game Development
- Research interests
 - Multimedia performance
 - Congestion control (protocols, AQM)
 - Wireless networking
 - Network games
- Current gamin'
 - Overwatch
 - League of Legends
 - Nuclear Throne



Data analysis!

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 |

Syllabus Stuff

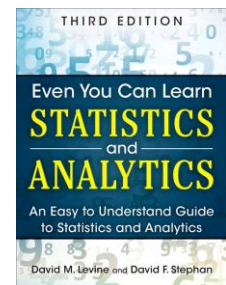
- <http://www.cs.wpi.edu/~imgd2905/d17>
- Class: M, T, Th, Fr 10-10:50am
- SA: **Charlie Lovering**
 - Office hours, forum, grading, class prep, help sessions
- Office hours:
 - Claypool (FLB24): Mo 1-2pm, Tu 3-4pm, Th 3-4pm
 - Lovering (FLA22): Mo 5:30-7pm, Th 5:30-7pm
 - Or by appointment
- Email
 - claypool@cs.wpi.edu (me)
 - imgd2905-staff@cs.wpi.edu (me + SA)
 - imgd2905-all@cs.wpi.edu (class + staff)

Text Book

David M. Levine and David 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



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



Course Structure

- Prerequisites
 - College algebra
 - No programming, stats, probability expected
 - No game analytics experience required
- Grading
 - Exams (30%)
 - Projects (60%)
 - Presentation(10%)
 - On the *Instruct Assist* Website: <https://ia.wpi.edu/imgd2905/>
 - Authenticate with WPI login and password

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

Projects

- 5 projects, 60% of grade total
- 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!

Presentation

Presentation

- Everyone 1 presentation
10% of grade total
- In-class, maximum 8 minutes long
 - Leave time for critique
- Content drawn from projects
- 5 people chosen at random from each project

Peer-critique

- Feedback to become better presenters!
- *Everyone* will provide for *every* presenter
 - Short, written form
- Presenter will review
 - Turn in short, written reflection

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/d17/timeline.html>

- Will notify if update

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

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!)

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

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