

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. 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

- Will meet during our regular time slot
 - Zoom
- Ask questions, provide updates, ...
- Lectures, but in small chunks
 - May pre-record and ask you to watch
- 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

- <http://www.cs.wpi.edu/~imgd2905/d20>
 - Linked from Canvas Web page
- Class: **M, T, Th, F** 10-10:50am
 - <https://wpi.zoom.us/j/542948614>
- Office hours (Zoom): **M, T, W, Th** 4-5pm
 - <https://wpi.zoom.us/j/460051336>
 - Or by appointment
- Email
 - claypool@cs.wpi.edu (me)

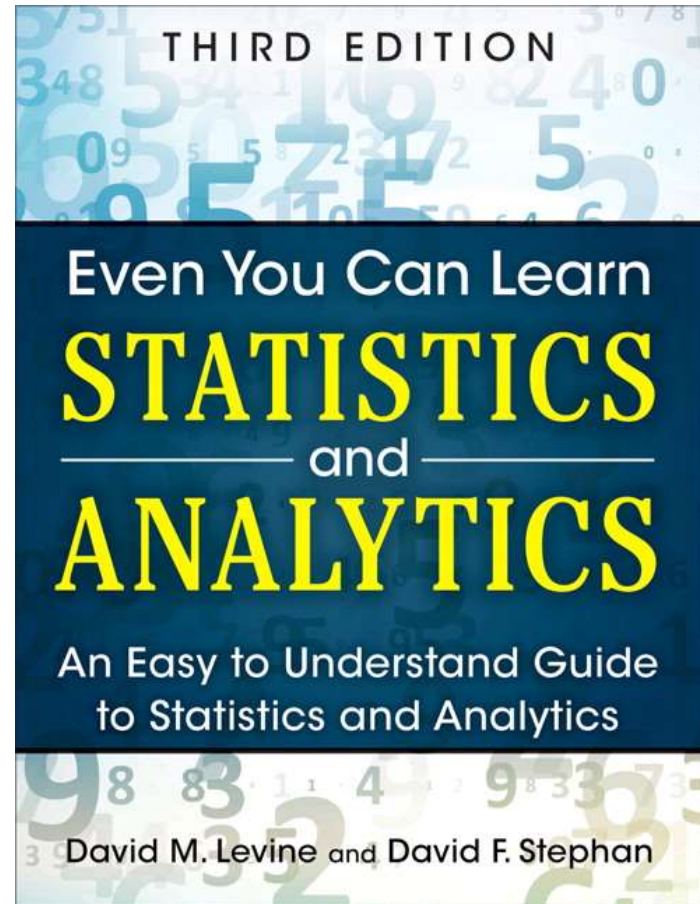
Text Book

D.M. Levine and D.F. Stephan

“Even You Can Learn
Statistics and Analytics”

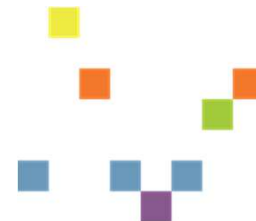
3rd ed. *Pearson*, 2015

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



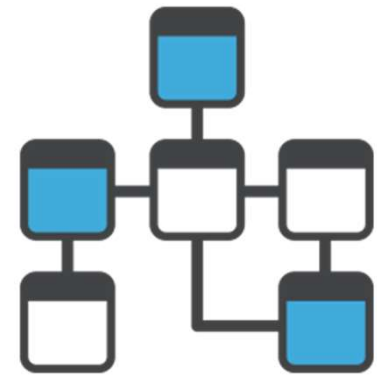
Class Topics

- 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
 - Projects (60%)
 - Homework (30%)
 - Participation (10%)
 - On the Canvas Website: <https://canvas.wpi.edu/courses/18262>
 - Authenticate with WPI login and password



<http://idwbi.com/wp-content/uploads/2017/01/database-Schema.png>

Projects



https://www.shareicon.net/download/2015/12/06/683311_board.svg

- 4 projects, 60% 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, dissemination
- Project 1 – today!

Homework

- Written problem set
- From the 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
- Weekly “survey” → get your feedback on how the class is going!
- 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)

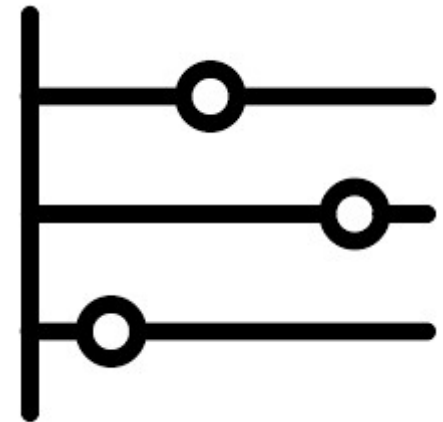


Timeline

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

<http://www.cs.wpi.edu/~imgd2905/d20/timeline.html>

- Will notify if update



Why This Class?

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