

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
 - Oxenfree



OXENFREE

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 |

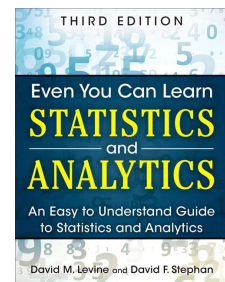
Syllabus Stuff

- <http://www.cs.wpi.edu/~imgd2905/d18>
- Class: M, T, Th, Fr 10-10:50am
- Office hours (FL B24):
 - Mo 12-1pm, Tu 2-3pm, Th 9-10am, Fr 12-1pm
 - Or by appointment
- Email
 - claypool@cs.wpi.edu (me)
 - imgd2905-all@cs.wpi.edu (class + 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
 - Exams (30%)
 - Projects (55%)
 - Presentation (10%)
 - Participation (5%)
 - 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, 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!

Presentation

- | | |
|---|---|
| <p>Presentation</p> <ul style="list-style-type: none"> • Everyone 1 presentation • In-class, maximum 4 minutes long <ul style="list-style-type: none"> – Leave time for critique • Content drawn from projects • When? 1 person per class <ul style="list-style-type: none"> – Assigned at random – Stay tuned for schedule | <p>Peer-critique</p> <ul style="list-style-type: none"> • Feedback to become better presenters! • <i>Everyone</i> will provide for <i>every</i> presenter <ul style="list-style-type: none"> – Short, written form • Presenter will review <ul style="list-style-type: none"> – Turn in short, written reflection – Reflection due 1 week after presentation |
|---|---|

10% of grade

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!

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/d18/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	
<ul style="list-style-type: none">• Duties<ul style="list-style-type: none">– 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	<ul style="list-style-type: none">• Requirements<ul style="list-style-type: none">– BS/BA degree Stats, Math, Econ, CS or related<ul style="list-style-type: none">• Graduate degree preferred– Business savvy– Technically adept<ul style="list-style-type: none">• SQL, Python• Excel, PowerPoint– Communicator<ul style="list-style-type: none">• Reports clear, and concise• Presentations to variety of audiences	