Gamification of Data Analysis
Why, How, and Next Steps
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Outline

The Data
Why we gamified it
How we gamified it
Difficulties faced
Future Work
Questions
Source of Data

• FRPs (Flexible Research Platforms)
The Data

Simulated Occupancy
Hundreds of sensors, minute resolution
  Temperature gradients
  Humidity
  Electricity Usage
  Air Current
  and many more

Giant SQL database
Data Problems

Big
Diverse
Spatial in Nature
Cumbersome to navigate
Potential non-technical users
Why Gamification?

- 3D Integration
- Interactivity and Ease of Use
- User Happiness
3D Integration
3D Integration
3D Integration
3D Integration
Interactivity and Ease of Use
Interactivity and Ease of Use
Interactivity and Ease of Use

No Syntax Required
Interactivity and Ease of Use
Software tools are only as powerful as users know how to use them and are willing to use them.
public float getSoftwarePower()
{
    return functionality * ease_of_use * time_used;
}
User Happiness

def getSoftwarePower():
    return functionality * ease_of_use * time_used
User Happiness

• User on the other end

• Emotional state matters
  productivity
  quality of work
So Why again?

3D integrations:
  Helps researchers with spatial awareness

Interactivity and Ease of Use:
  Helps deal with size and diversity of data
  Nontechnical users can use

User Happiness:
  Feels less clunky and Users can use longer
How?

Five steps
1. Created models in Unity
2. Database Integration
3. Created Graphing functionality in Unity
4. Secure Data
5. Integrated into our webpage
Creating Models

Building codes and Unity Editor
Creating Models

Other Things:
- Lighting
- Textures
- Skybox
- Doors
- Colliders
Database Integration

Five Technologies:

C#
PHP
JavaScript
SQL
HTML
Database Integration

Unity GameObject contains a C# script

C# script then reads the text off the HTML page. The GameObject can then use data from our server(s)

C# script using Unity's WWW class sends PHP request and waits

PHP script receives the request using $POST and calls an appropriate MySQL query

The PHP script then outputs the MySQL query result as an HTML page
Graphing Functionality
Used Unity’s Particle System
Security

Proprietary!

used login
Website Integration

Unity Webplayer makes it easy
Expenses

Labor: 250 man hours of a student (me)
Unity: $1000
Art Assets: $80
Lessons learned: Priceless
Difficulties

1. Game design is a different beast
2. Uncharted Territory
Future Work

The sky's the limit.
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(500 times better?)
Questions?