

Physics Simulation

Joseph Britt

Problem Addressed

- Hard to visualize/demonstrate physics concepts
 - Especially with larger values
- Created a tool for understanding physics problems in an academic setting
 - Not a general simulator

Features

- Users can create their own simulation
- Hotkeys for certain actions or show more information
 - Swap between simulations
 - Reset simulations
 - Show scale
 - Takes snapshots of object at regular intervals
 - Hover over snapshot to show attributes of the object

Project Layout

- OpenGL
 - For displaying
- C++
 - For Calculation
- Boxes
 - Track Position, Velocity, Acceleration, Rotation angle, and other attributes
- Simulations
 - Tracks multiple boxes
 - Does calculations on boxes for specific simulation

Future plans

- Easier for user to create simulation (drag and drop)
- Ability to combine simulations
- More physics concepts simulated
- Capture snapshot at specific time/speed
 - Physics problems follow a general pattern
 - What the velocity is at x seconds?
 - How many seconds does it take for a box to reach y velocity?

Video

<https://youtu.be/aJkPJMlih74>