

Dwayne Elahie - 3D Character Animator

aka Cilsya



www.cilsya.com

Presenter

What is a Video
Game?

Game Features

Game Loop

Mathematics

Animation

Contact

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What is a Video Game?

- A computer game is a computer-controlled game.
- A video game is a computer game where a video display such as a monitor or television is the primary feedback device.

Example: 1

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Game Features

- 2 Players Simultaneously
- Split Screen
- Third Person Perspective (Camera Follow)
- Sound
- Collision Detection
- Particle Effects
- Simulated Physics (Acceleration and Recoil)

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What is a Video Game?

Game Features

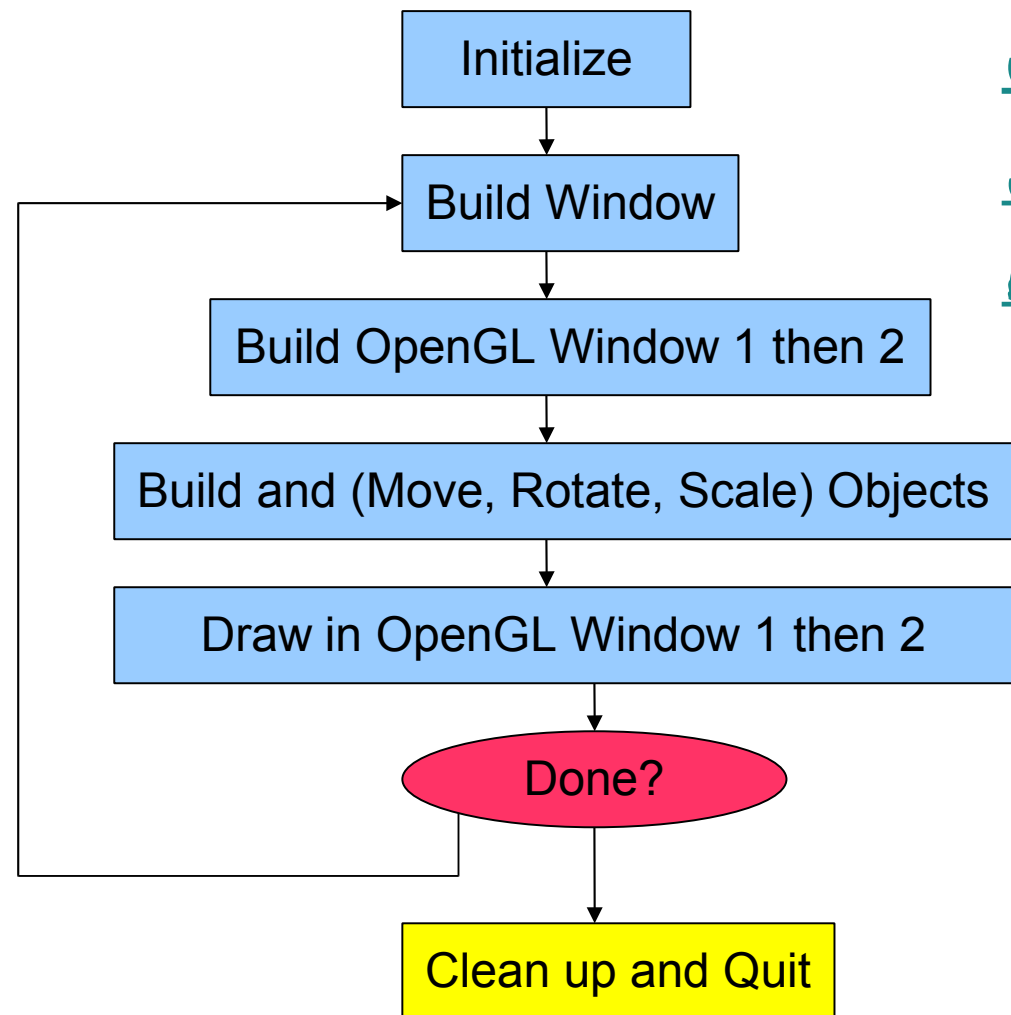
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Super
Simplified
Game Loop



Example: 2

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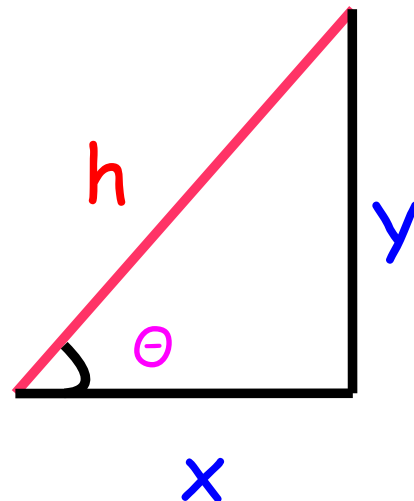
Animation

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The Math

Direction/Rotation of Vehicle

```
Player01.YaxisP1 += Player01.kAcceleration_RT * sin(Player01.ZrotP1 * (pi/180)) * Movement_Time;  
Player01.XaxisP1 += Player01.kAcceleration_RT * cos(Player01.ZrotP1 * (pi/180)) * Movement_Time;
```



Given distance 'h' and angle 'θ', you can figure out distance in x and distance in y.

$$X = h * \cos(\theta)$$

$$Y = h * \sin(\theta)$$

Example: 3

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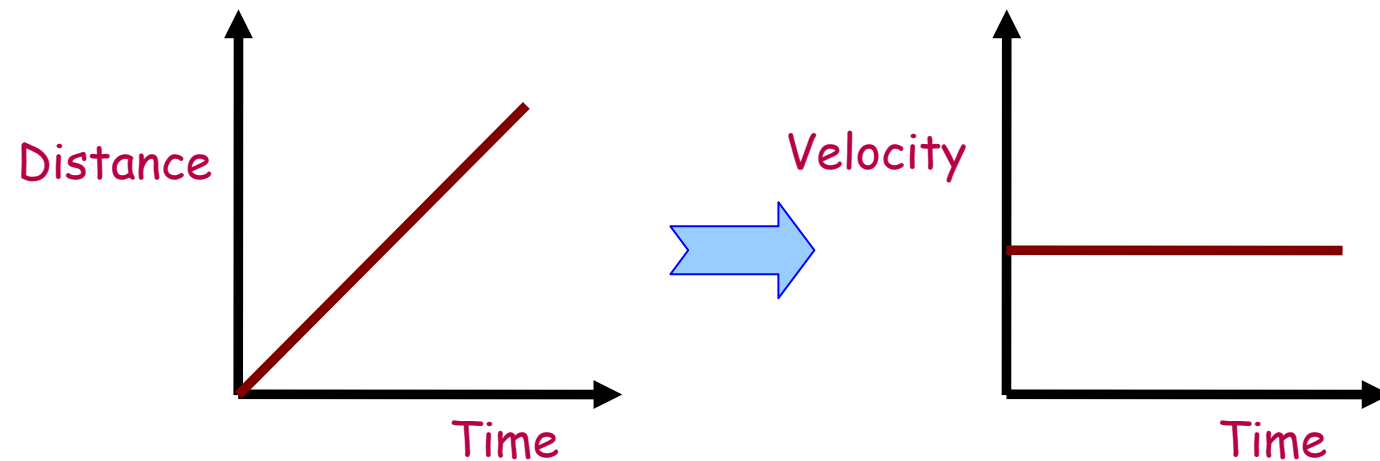
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The Math

Distance Traveled - **Constant Velocity**



Example: 4

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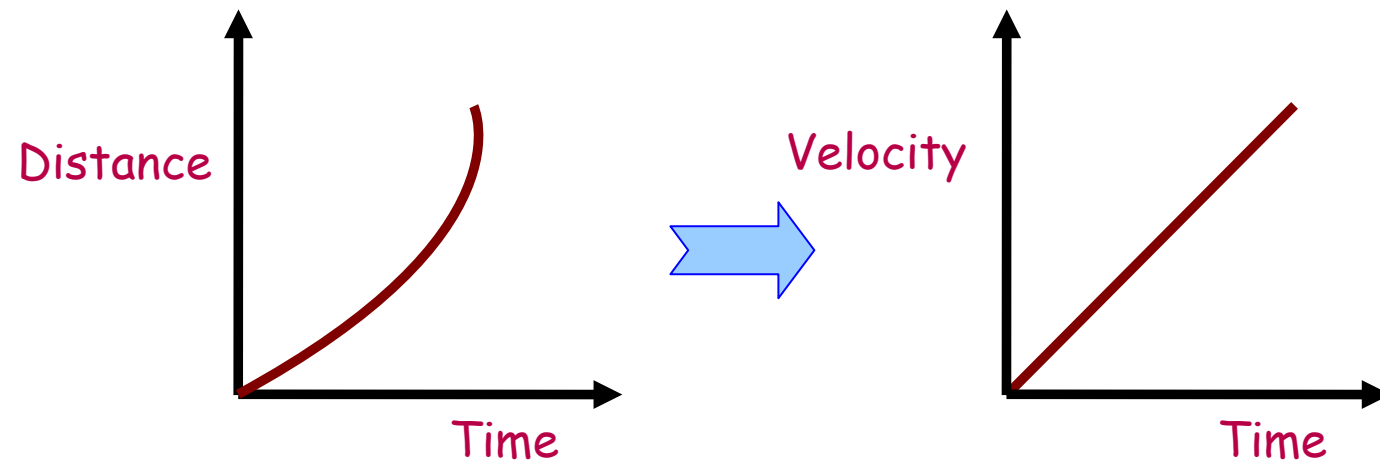
Mathematics

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The Math

Distance Traveled - **Constant Acceleration**



Example: 5



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Newton's Laws of Motion (Scientific)

- I. Every object in a state of uniform motion tends to remain in that state of motion unless an external force is applied to it.
- II. The acceleration of an object is directly proportional to the net force acting on it and inversely proportional to its mass.
- III. For every action there is an equal and opposite reaction.

Example: 6

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The Principles of Animation (Artistic)

1. Squash and Stretch
2. Anticipation
3. Staging
4. Straight Ahead Action and Pose to Pose
5. Follow Through and Overlapping Action
6. Slow In and Slow Out
7. Arcs
8. Secondary Action
9. Timing
10. Exaggeration
11. Solid Drawing (Solid Mesh in 3D) aka Weight (*Example*)
12. Appeal (next section)

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Fred Moore 14 Points of Character Animation

1. Appeal in drawing
2. Staging
3. Most interesting way?
[Would anyone other than your mother like to see it?]
4. Is it the most entertaining way?
5. Are you in character?
6. Are you advancing the character?
7. Is this the simplest statement of the main idea of the scene?
8. Is the story point clear?
9. Are the secondary actions working with the main action?
10. Is the presentation best for the medium?
11. Does it have 2 dimensional clarity? (silhouette)
12. Does it have 3 dimensional solidity? (weight)
13. Does it have 4 dimensional drawing? (Drag and follow through)
14. Are you trying to do something that shouldn't be attempted?

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