Trace 360

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CSS 450 Final Project Report

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Game Overview

Trace 360 is a remake of the hit iPhone game, Trace (http://www.bovinedragonsoftware.com/Trace/trace.php), but slightly modified and built using XNA 2.0. The purpose of Trace 360 is for the user to navigate a stick figure, appropriately named *Stickman*, from a starting point in the level to an endpoint without dying. Stickman can die by being hit by obstacles in the level or by falling off of the map. When the level starts there is not a path between the start point and the end point, but there may be platforms or other objects (safe objects – won't kill Stickman) in the level that Stickman can walk on without being injured, throughout the level. The player must draw the path between the two points without falling off the map and without being hit by obstacles. The player can use the existing safe objects to assist it in making it to the end point. There are two predefined levels of game play. After beating the first level, the second level will load.

Controls

Trace 360 is controlled by using both the mouse and the keyboard

Game Controls

Pause	1
Resume	2
Reset	3
Zoom In	X
Zoom Out	Z

Hero Movement

Move Left	A
Move Right	D
Jump	W
Sprint (1 second)	Space bar

Tracing

To draw trace lines, **left-click** where you want to start drawing and **drag** the mouse over the path you would like to create. If you make a mistake, **right-click** the mouse anywhere and it will remove the last line you created. If there are other lines you have drawn it will remove each one until no lines remain.

Current Issues and Future Possibilities

Known Bugs

- No lines indicating when you are leaving world bounds. The game does recognize the world bounds and reacts accordingly, but there are no visible bounds for the user to see.
- If the line that has been drawn by the user has too steep of an angle in it, the collision detection does not work properly, and the hero can walk or fall through the line.
- If too many lines are drawn the performance degrades quickly
- The bounding boxes for the exit object (the sun) and the spiral boxes are too big, so you collide with them before it looks like you should.
- Sometimes jumping does not work

Limitations

- The trace lines can create a large number of circles. When there are too many, the performance degrades. A better choice might be lines, but you lose the smoothness of the line. I am not sure if it is a UWB library thing, or just too many objects period.
- The design of the game results in quick game play. Therefore, more levels are needed to create a compelling game. This can be fixed by adding more levels with more variety.
- Keyboard behaves erratically when switching keys rapidly

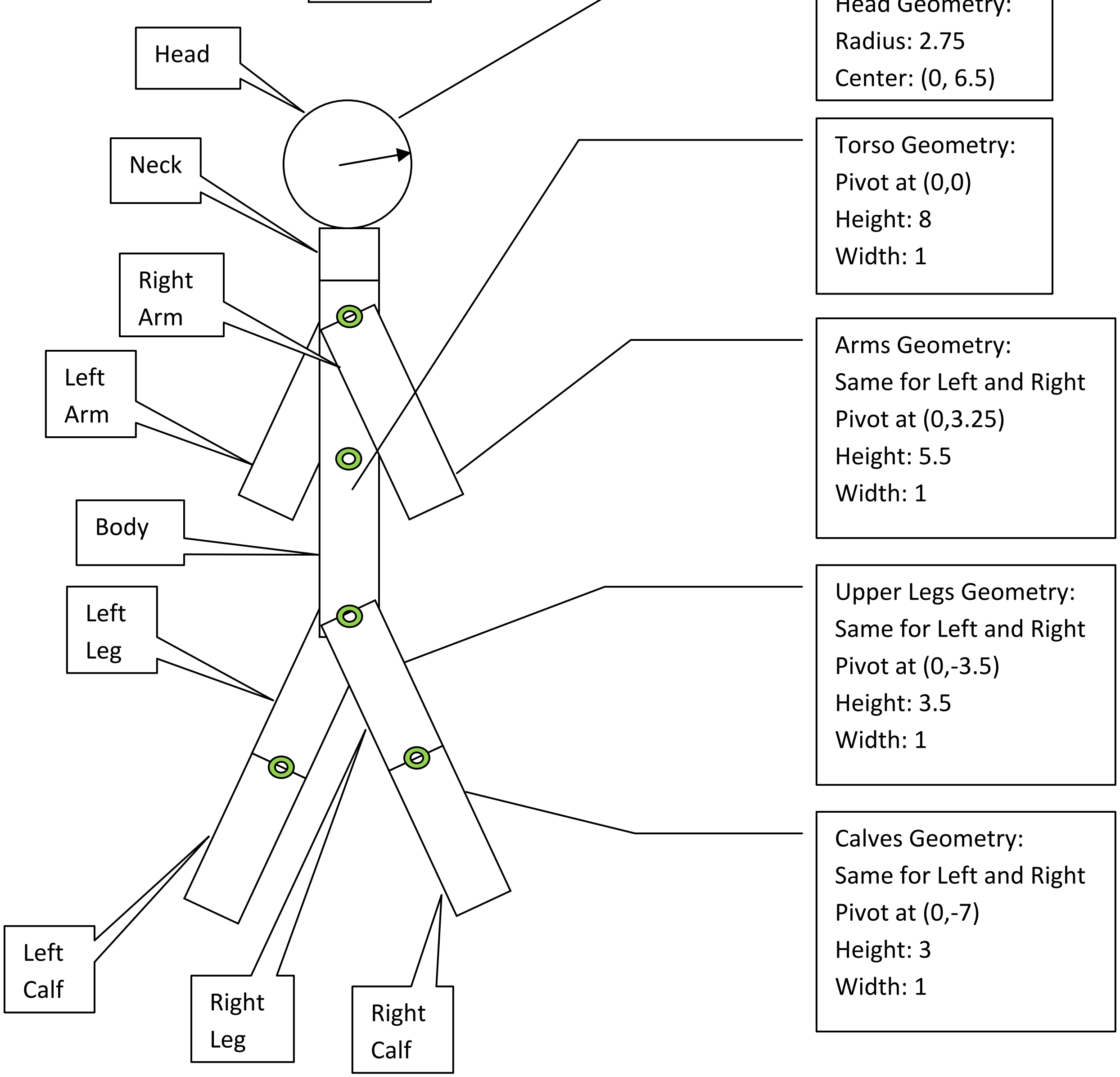
Possible Next Features

- More portable code base
- Add a level designer
- Store and Load levels to/from disk
- More levels
- More objects available per level
- Smarter AI for the level objects
- Visual level selection. Let the user choose from a set of levels to play.
- Add network features to race against your friends.

Hero Geometry

In reality, before the hero moves, the arms and legs overlap when drawn, but they are depicted to look like hero does while walking, so that you can see that there are two legs and two arms. Otherwise they would cover each other making only one arm and one leg visible.

Figure 1



Head Geometry:
Radius: 2.75
Center: (0, 6.5)

Torso Geometry:
Pivot at (0,0)
Height: 8
Width: 1

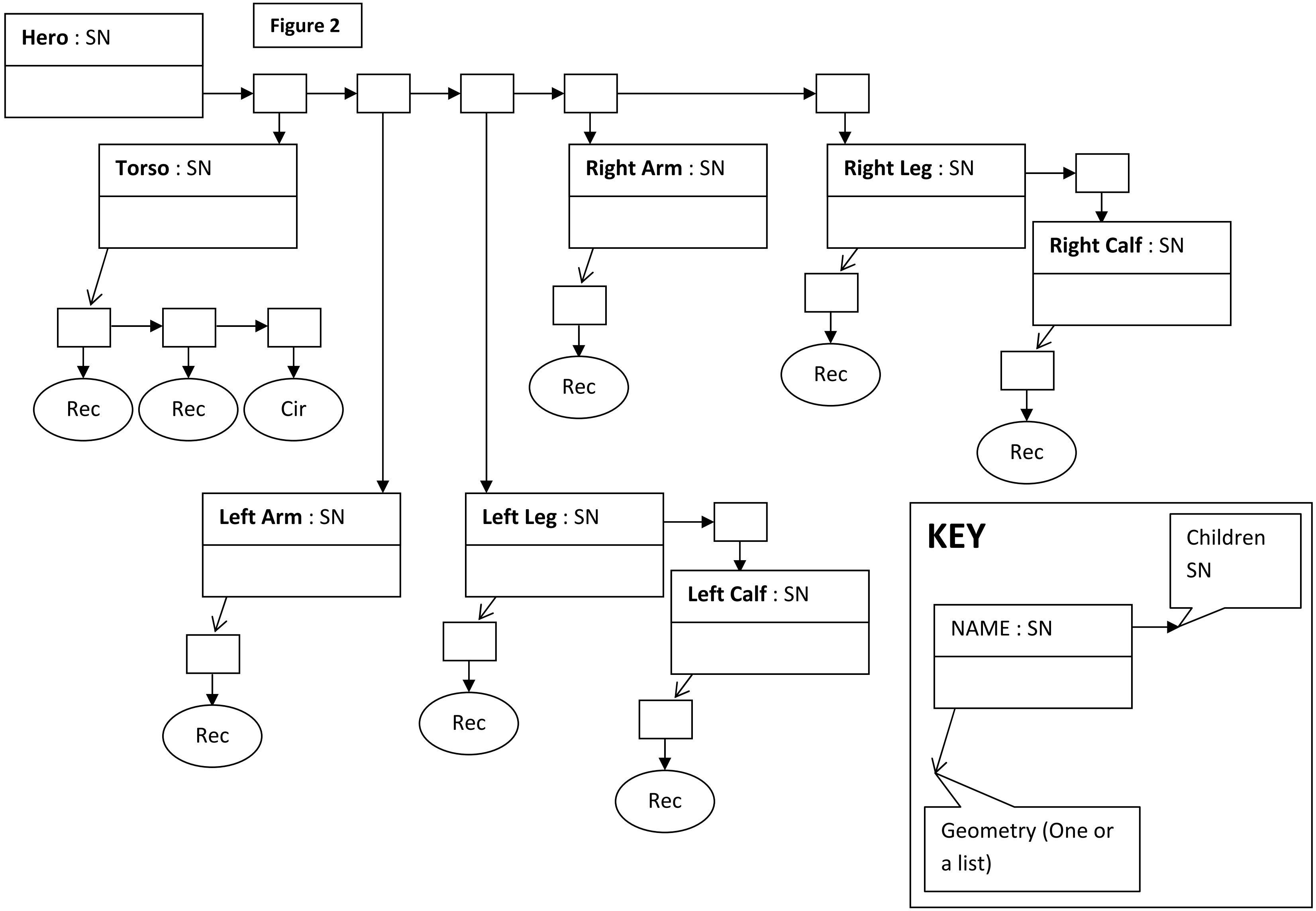
Arms Geometry:
Same for Left and Right
Pivot at (0,3.25)
Height: 5.5
Width: 1

Upper Legs Geometry:
Same for Left and Right
Pivot at (0,-3.5)
Height: 3.5
Width: 1

Calves Geometry:
Same for Left and Right
Pivot at (0,-7)
Height: 3
Width: 1

Data Structure

Figure 2 describes the underlying data structure that makes the hero. The key in the bottom-right of the corner describes the types of different objects in use in the diagram.


Hero : SN
Figure 2
Torso : SN
Rec
Rec
Cir
Right Arm : SN
Rec
Right Leg : SN
Rec
Right Calf : SN
Rec
Left Arm : SN
Rec
Left Leg : SN
Rec
Left Calf : SN
Rec
KEY
Children SN
NAME : SN
Geometry (One or a list)