

Software Infrastructure Part 1

CS 422: Intelligent Avatars Lab

Spring 2010

Second Life (SL)

- A virtual world is just like a real world
 - Take classes, go to concerts, go shopping, more...
- Avatars can go to different places to talk, trade, and interact with each other
- Can trade virtual goods like land or objects
- SL also allows us to retrieve information and send commands programmatically
 - Place Intelligent Avatars in this environment

Second Life (SL)

- Moving around (see SL Quickstart Guide on class website)
 - Walk or run on the ground
 - Fly
 - Teleport
- Changing your avatar appearance
 - Plenty of places to get free stuff in SL, search for “free”, “free clothes”, etc.
- Finding places
 - Search feature in SL viewer
 - <http://slurl.com/>

Second Life (SL)

- Communicating with other avatars
 - Local chat (heard within 20m radius)
 - Instant message (anywhere in SL)
- Interacting with the environment and objects
 - Only default action is sit
 - But users can define custom actions on objects they create

Second Life (SL)

- All objects in SL (avatars, parcels, items) are uniquely identified by a UUID string
- Avatars are uniquely identified by their first+last names or their UUID
- The SL world is divided into pieces of land called regions (aka “sims”)
 - Each sim corresponds to a backing server
 - Regions are further divided into smaller pieces of land called parcels that can be bought/sold

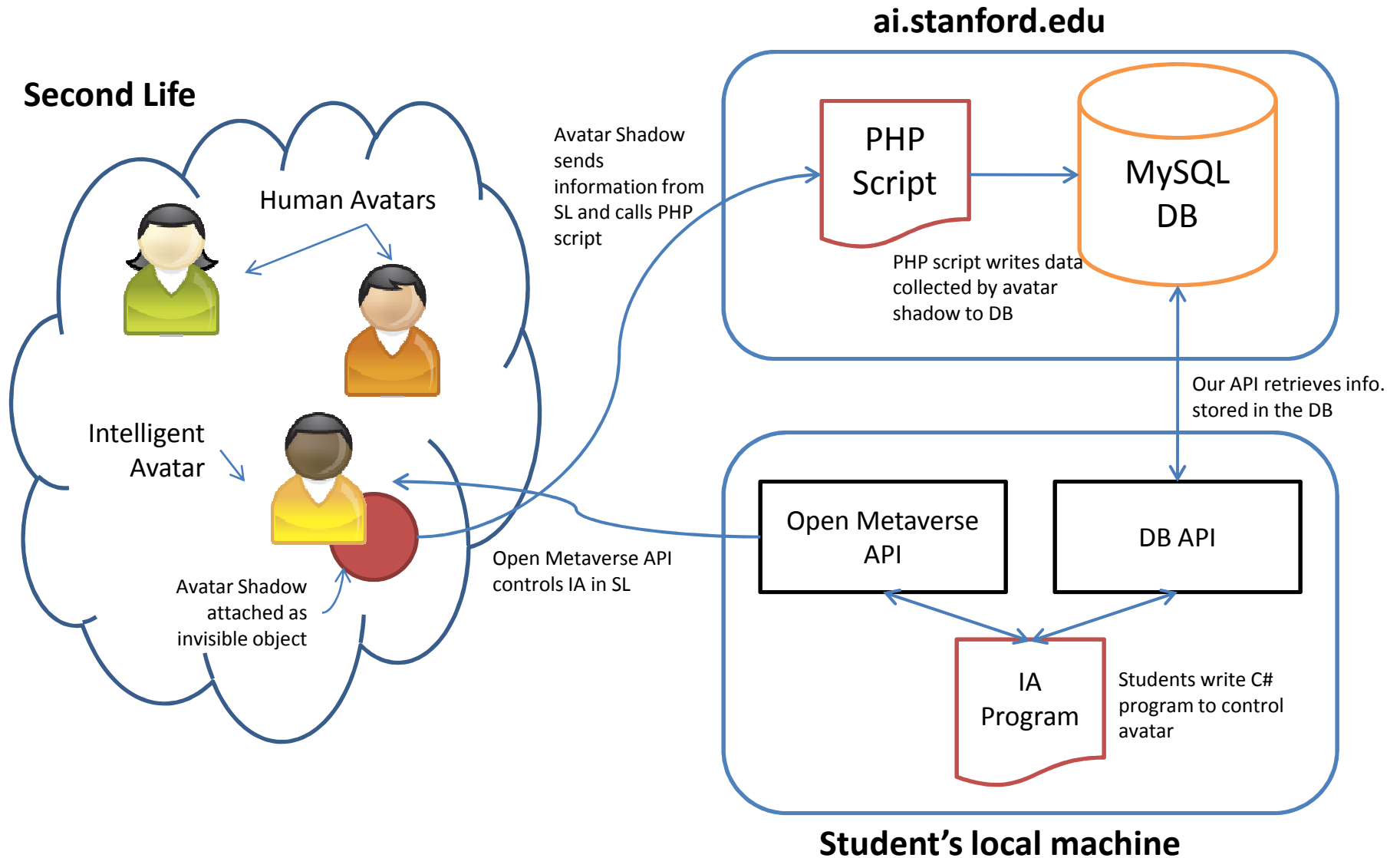
Second Life (SL)

- Currency used in SL called Linden dollars or L\$
 - Exchange real currency for L\$ and vice versa
 - Probably won't be using L\$ in the class (unless you can think of an interesting project...)
- Create objects in SL using builder tool and Linden Script
 - Objects can be bought/sold, this forms the basis of the SL economy
- Go to secondlife.com and create an account
- Download the viewer and login
- Demo

IA Software Architecture

- Get avatar data from SL using an invisible Avatar Shadow object (Linden Scripting Language)
- Write data collected by shadow into a database (MySQL) using script (PHP)
- DB API (C#) will be provided to get information from database; may also access DB directly
- Control avatars using Lib OpenMetaverse (C#)
 - This is what you will be mostly using

IA Architecture Diagram



Software to Install

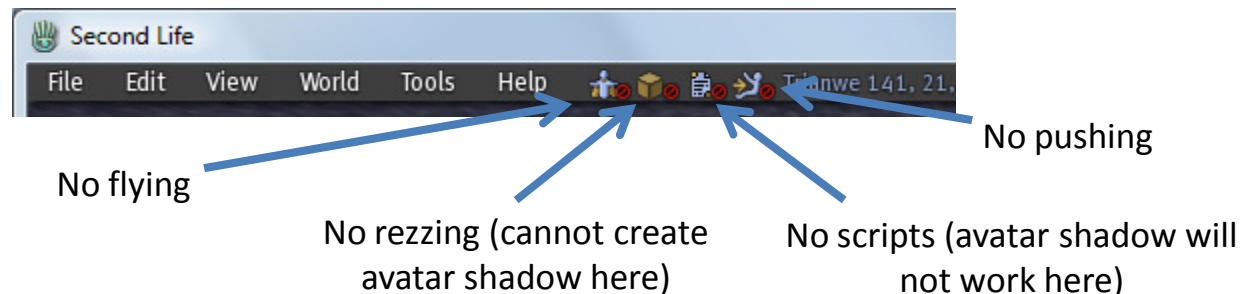
Install the following on Windows:

(Mac/Linux users should either dual boot into Windows or use a virtual copy)

1. Second Life Viewer
 2. Visual Studio 2008 with C# Support (comes with .NET 3.5 framework)
 - Do not use other versions of Visual Studio or .NET
 3. Lib Open Metaverse
 4. Cygwin with OpenSSH
 5. MySQL Connector/ODBC driver
- Note: everything can be downloaded for free, see the Software Resources page on the class website.

Avatar Shadow

- Invisible object that logs information to the DB
- Attaching the shadow to your avatar:
 1. Go to a region that allows rezzing (building)
 2. Create an object with the script (on class website)
 3. Attach object to heads-up display (HUD)
 4. Verify it is working by checking the DB
- Gotcha: different parcels in SL have different rules:



Avatar Shadow Detailed Instructions

(courtesy of Matt Rubin)

1. Find a region that allows you to rez objects. (Second Life Lingo: Rez means to create or to make an object appear) At the top of the SL window, just to the left of the name of your current location, you may see a number of small icons. If one of these looks like a yellow cube with a red "no" symbol, you need to find a new place to work. try searching for a "sandbox" location, in which any sort of rezzing is allowed.
2. Click the "Build" button at the bottom of your screen. From the palette that appears, pick a type of primitive object to hold your script. Its appearance does not matter much, since it will only be seen by you and not by other users. select the object type from the palette and then click on the ground near your avatar to rez the object. The flickers of light between your avatar's hand and the object show that you are editing it.
3. Name the object something that will help you identify it in your inventory. A simple choice is "Avatar Shadow."
4. Switch to the "content" tab of the build palette and click "new script." Enter the tracer script in the window that appears, then click save. A message should appear saying "Compile successful! Save complete."
5. Close the editing windows and right click on your object. Select "Take" to put it in your inventory. Open your inventory from the lower-right corner of the screen and find the Shadow in the inventory pane. Right-click the object and select "Add to HUD > Bottom." (More Lingo: Heads up display (abbreviated HUD) is a display layer that appears only on the screen of a specific avatar. Any object attached to your HUD remains fixed in your viewer, no matter how much you move around in the world, and cannot be seen by other users.)
6. The Shadow should now be properly sending data. To verify this, check the database or turn on in-world debugging. To do so, right click the object, select edit, move to the content pane, open your script, and change the constant String DEBUG fro "false" to "true". The script will now print out the data it is sending and receiving. A few seconds after each data packet is sent, a message should appear saying "HTTP Response:" If this is followed by text saying "Moment logged." your shadow is working properly.

Database

- MySQL database on ai.stanford.edu
- Collecting the following information when the Avatar Shadow is attached:
 - Each IA's location every 10 seconds
 - All local chats heard/spoken by IA
 - Any time the IA teleports
 - Information on parcels visited
 - Meetings of IA with other avatars
 - “Meeting” is any two avatars within local chat distance of each other

Database - Connecting

- You will have read-only access using user “secondlife_ro”
- Can access via web:
<http://ai.stanford.edu/secondlife/sqlbuddy/>
- Will also be able to connect to DB directly through code (next lecture)

Summary

- For Wednesday:
 - Decide if you will take the class
 - Find a project partner (teams of 2)
 - We will also hold a partner matching session on Wednesday
 - Create a SL account and play around
 - Attach an avatar shadow object and verify it is working
 - Start installing the other software (especially Mac/Linux users without a working copy of Windows)
- Homework assignment will be going out on Wednesday and due in a week
- Please fill out survey before leaving today