AD41700 – Fall 2011

Unity3D – Max/MSP/Jitter Workshop:

adding sound and image interaction to Unity3D

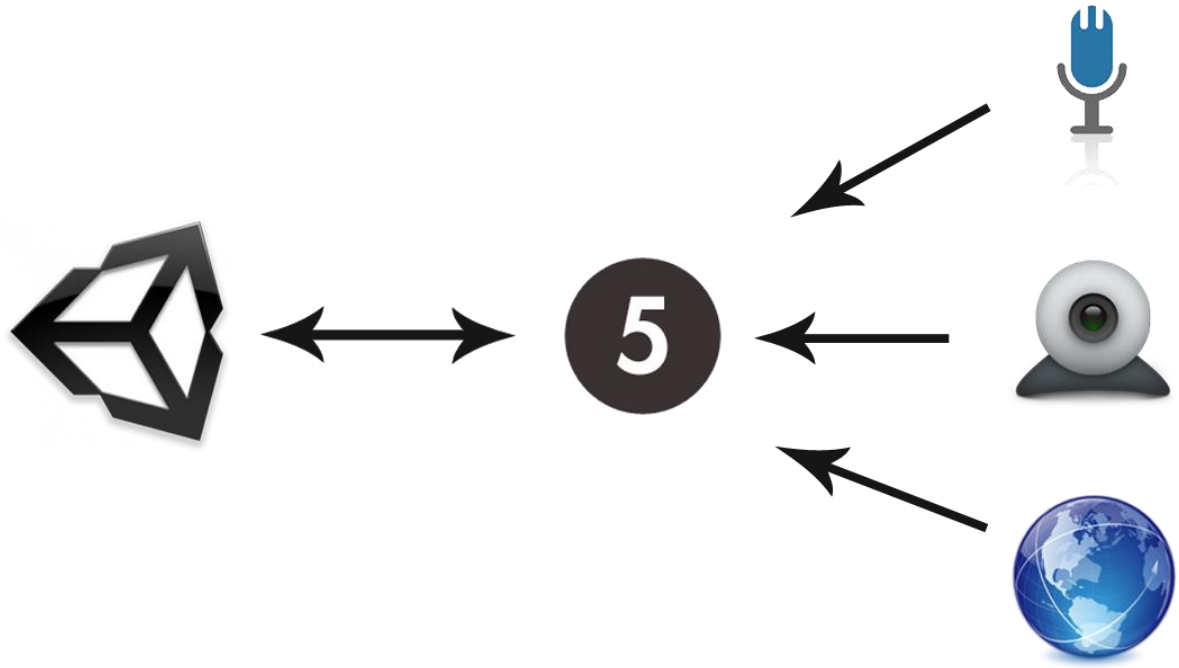
Remzi Yagiz Mungan

yagiz@purdue.edu

Document v1.02

October 12, 2011

Table of Contents



Why Max/MSP/Jitter?

Max/MSP/Jitter is a visual-programming language that is very convenient to use for creating an interface between real world and virtual world/machine/other software. It provides simple handling and processing of image, sound and video.

You can expand the Unity3D beyond it is limitations via

- Video/Image processing
- Sound processing
- Integrating with Arduino or Wii Remote

Setting Up

1. Set up Unity3D[1]
    - Free version available at http://unity3d.com/unity/download/
2. Setup MAX/MSP/Jitter[2]
    - Demo version at http://cycling74.com/
3. Do not block Unity and Max related to network traffic
    - You can not allow Unity or Max through firewall in computers in the Mac lab at Stewart B31 but saying 'allow' and leaving it at the 'enter administrative username and password' screen does the trick.

Sample Tutorials

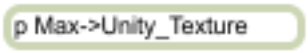
1. **MAX to Unity**
    a. Transferring video from MAX/MSP/Jitter to Unity3D
    b. Triggering events in Unity3D via MAX/MSP/Jitter
2. **Unity to MAX**
    a. Triggering in MAX/MSP/Jitter from Unity3D

[1] This workshop document is prepared for Unity3D version 3.5
[2] This workshop document is prepared for MAX/MSP/Jitter version 5

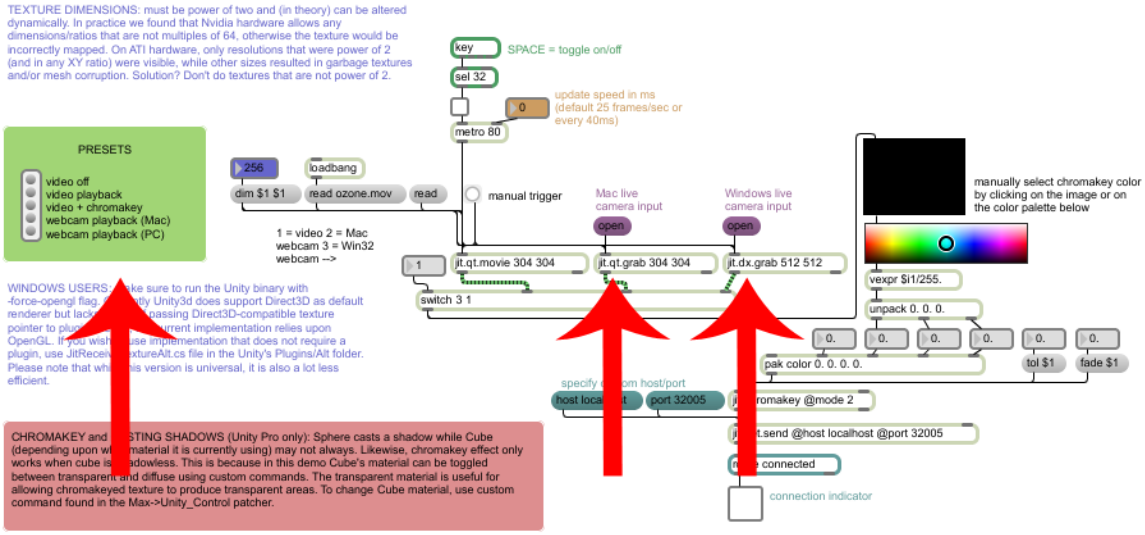
Workshop Tutorial 1.a: Transferring video from MAX/MSP/Jitter to Unity3D

Ideas: Playback video (either live or recorded) from Unity3D free version. MAX/MSP/Jitter allows easy manipulation of video data.

1. Download Unity project from: http://dl.dropbox.com/u/265455/UnityVideo.zip
2. Download MAX patch from: http://dl.dropbox.com/u/265455/MaxVideo.zip
3. Extract UnityVideo.zip (Unity project zip)
4. Go to UnityVideo > Assets > UnityWebcam.unity
5. Update the project if necessary
6. Extract MaxVideo.zip (Max patch zip)
7. Go to MaxVideo > MAX-Unity.maxpat
8. Go to Unity and play the project
9. Go to Max Window and double click on p Max -> Unity_Texture (see below)

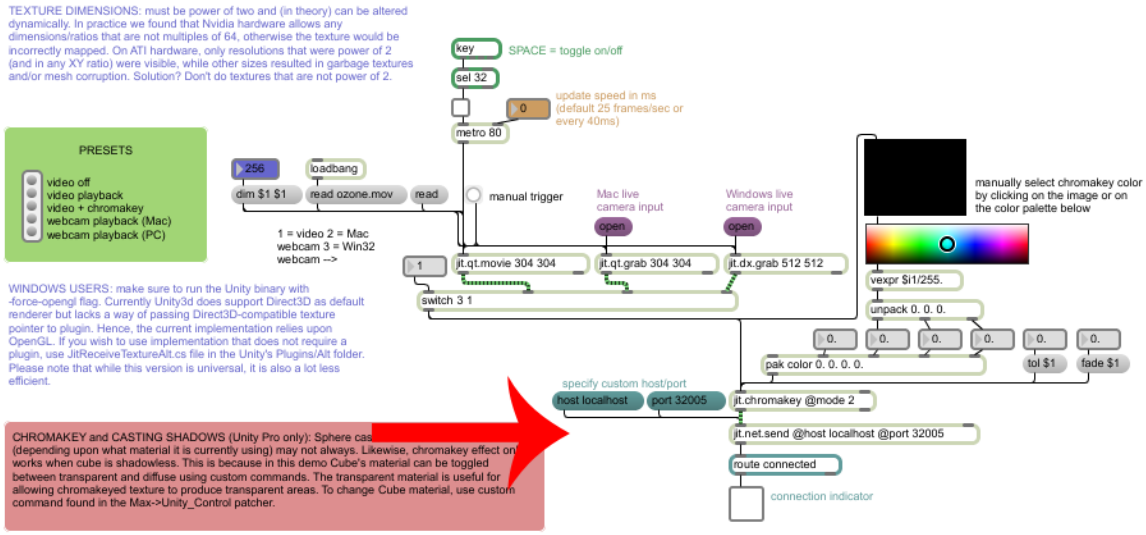


10. Choose a preset from the left window (if you choose a webcam do not forget to turn it on from middle. See figure below :



11. Have fun for a little bit in Unity window

12. Look at the jit.net.send object



13. Go to Unity and stop the game and click on the object ‘plane’

14. In the inspector window look at “Jit Receive Texture Alt (Script)”

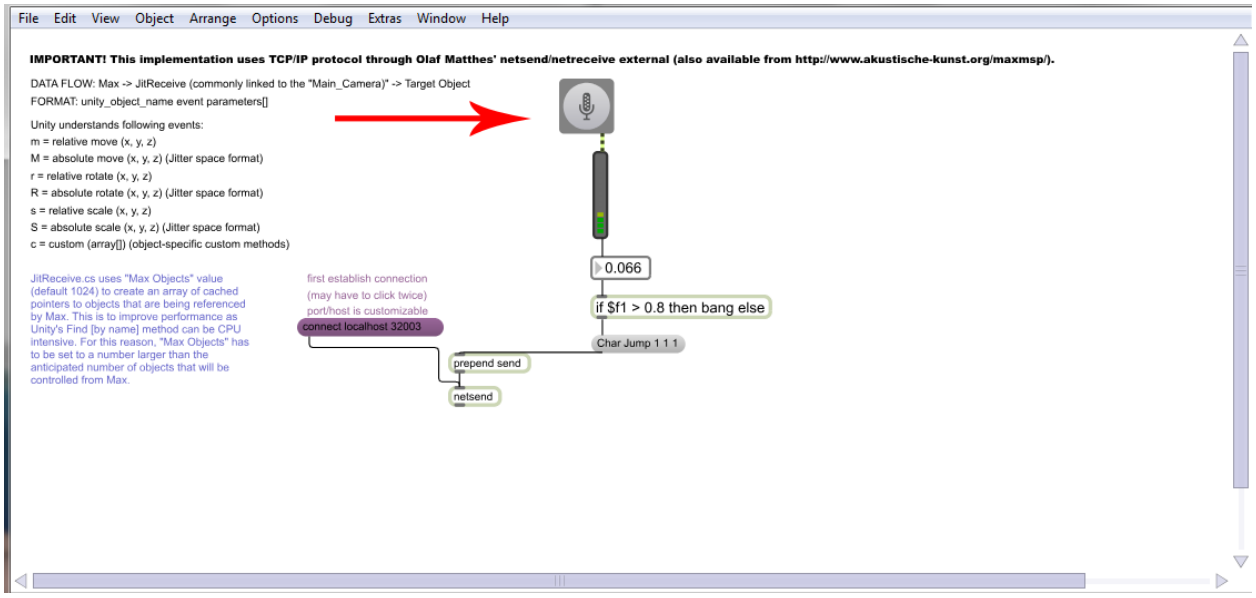
Notes: This is really nice but also ineffective computation-wise. If you just want to use a video file as a texture you might consider UnityPro for students (100$). However if you want to stream live video, this method is quite useful as you employ the power of Max/MSP/Jitter (to process the video).

Workshop Tutorial 1.b: Triggering events in Unity3D via MAX/MSP/Jitter

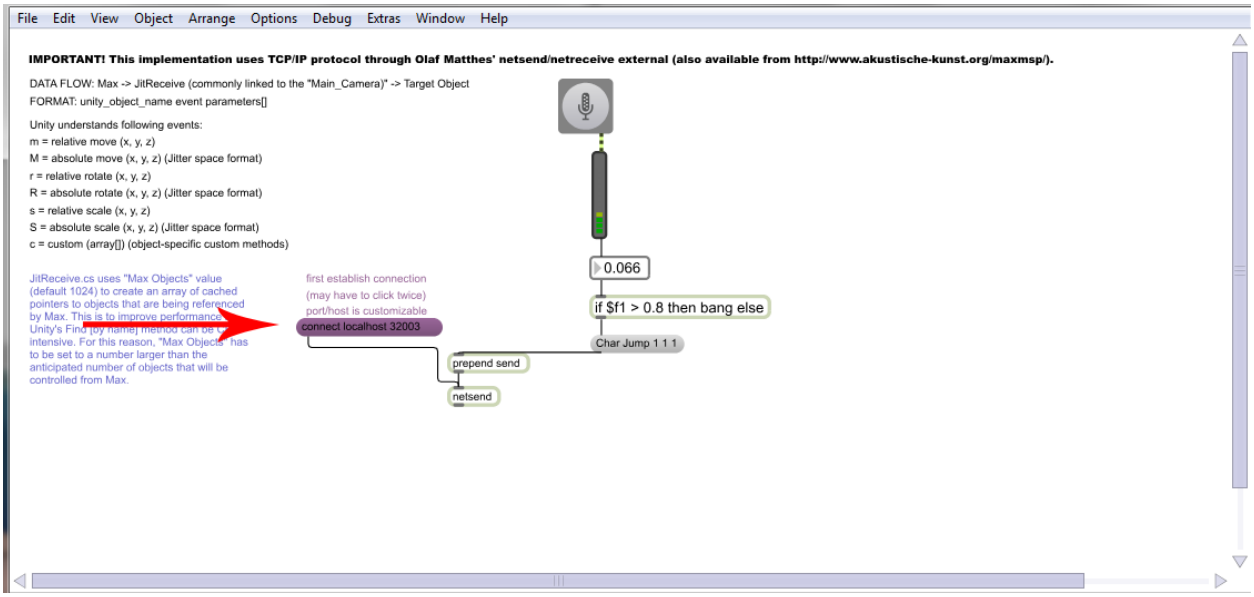
Ideas: Motion gaming, sound gaming. Using different types of inputs for games.

1. Download Unity project from: http://dl.dropbox.com/u/265455/2DLerpzEdited.zip
2. Download MAX patch from: http://dl.dropbox.com/u/265455/MaxJump.zip
3. Extract 2DLerpzEdited.zip (Unity project zip)
4. Go to 2DLerpzEdited > 2DLerpzEdited > Assets >2D Platformer.unity
    - Update the project if it asks
5. Extract MaxJump.zip (Max patch zip)
6. Go to MaxJump > MaxJump.maxpat
7. In Unity window press 'play'
8. In Max window doubleclick 'p Max->Unity_Control' (see below)

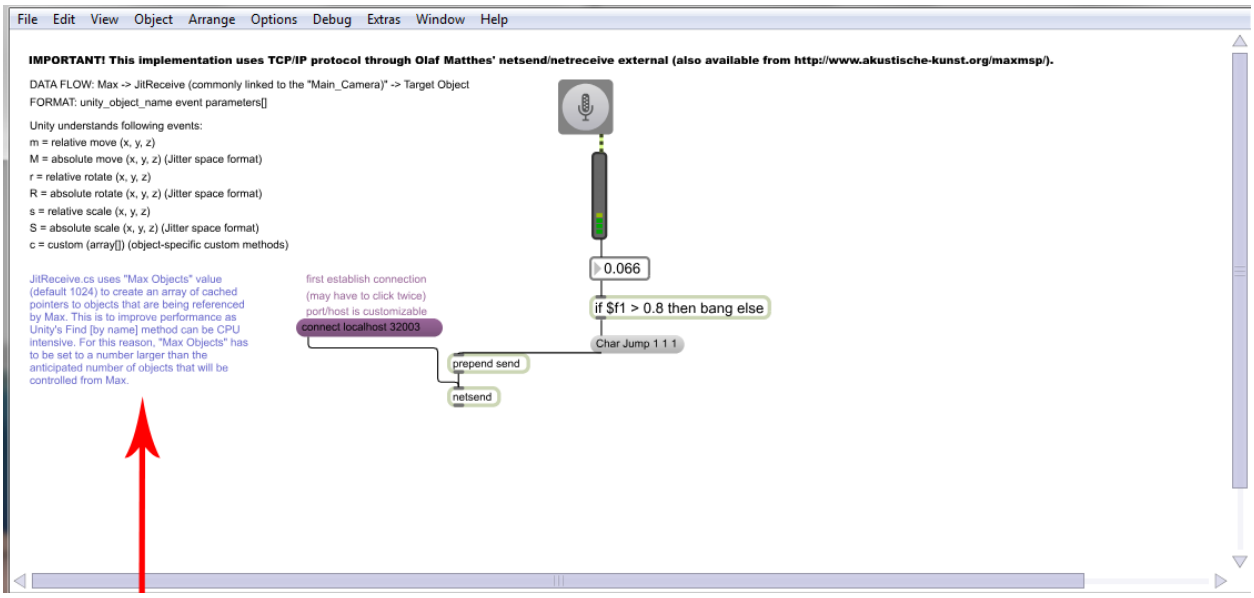
9. Click on the microphone image (see below) to activate the microphone (the slider should also go alive)



10. Click on 'connect localhost 32003' (see below)



11. Go to Unity window, make some sound and see that Lerpz jumps
12. On max window see the instructions on the left side (see below)



13. On Unity window, stop play and check 'JitRecieve.cs' that is attached to the main camera (see line 165)
14. Check 'PlatformerController.js' that is attached to the object 'Char'
    - Lines 102-103
    - Lines 251-255
    - Lines 261-263
15. Press play on Unity window
16. Go to Max window
17. Click ctrl+e or apple+e

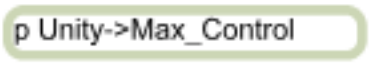
18. Press ‘m’ to create a message object
19. Write ‘Cube m 0 1 0’ inside the object (without ‘)
20. Wire the bottom connector of the message object to ‘prepend send’
21. Wire the output of ‘if $f1 > 0.8 then bang else’ object to the top left of the message object
22. Click ctrl+e or apple+e
23. Again click on the ‘connect localhost 32003’
24. Go to Unity window, make some sound and see that Lerpz and a crate jumps

Notes: The problem with video or audio tracking will be the noise floor (both sound and light). If the threshold is lower than the noise, the event will be triggered by noise. You can, of course, change the threshold or make the system more robust to variance in noise level.

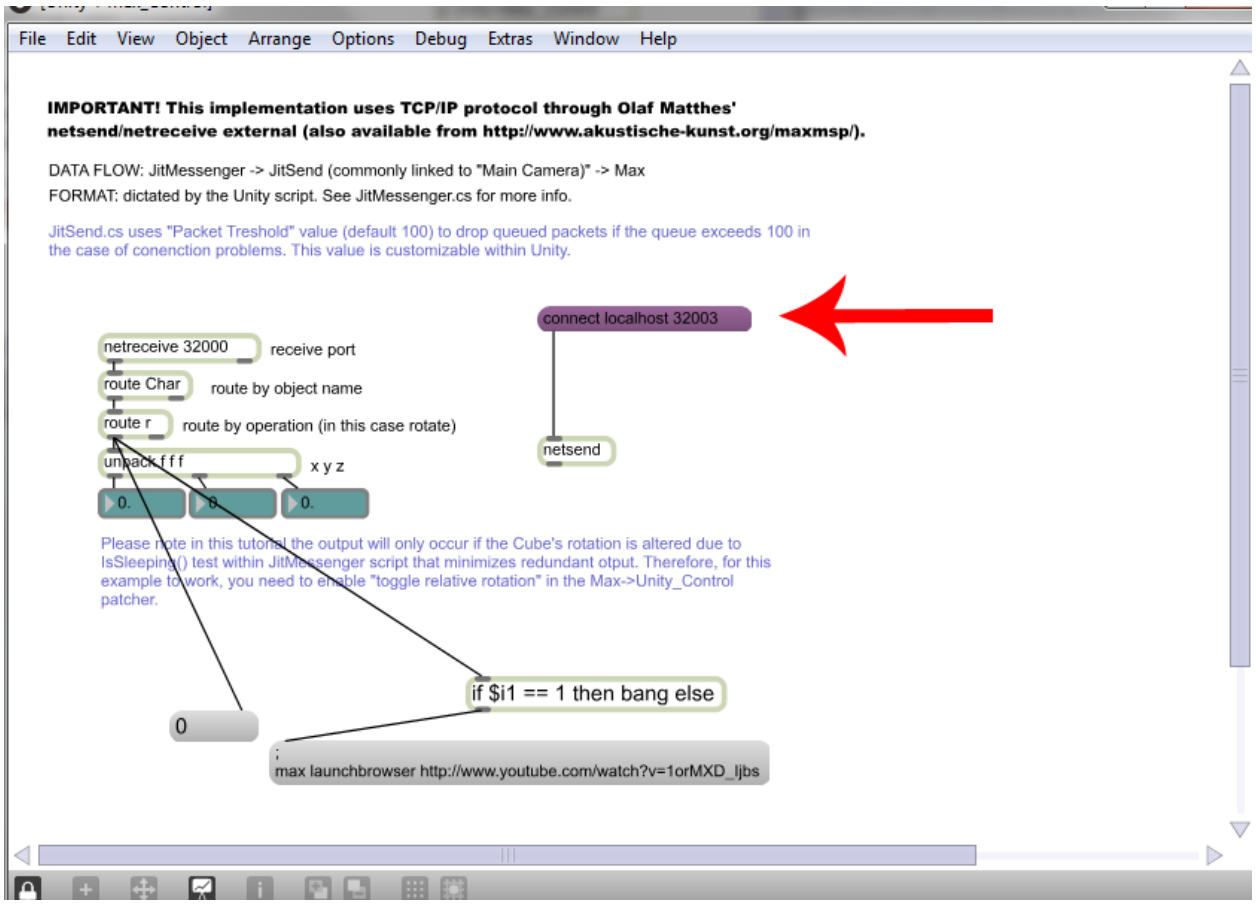
Workshop Tutorial 2: Triggering in MAX/MSP/Jitter from Unity3D

Ideas: Using Max to expand the possibilities of response in a computer game.

1. Download Unity project from: http://dl.dropbox.com/u/265455/2DLerpzEdited2.zip
2. Download MAX patch from: http://dl.dropbox.com/u/265455/MaxMusic.zip
3. Extract 2DLerpzEdited2.zip (Unity project zip)
4. Go to 2DLerpzEdited2 > Assets >2D Platformer.unity
    - Update the project if it asks
5. Extract MaxMusic.zip (Max patch zip)
6. Go to MaxJump > MaxJump.maxpat
7. In Unity window press 'play'
8. In Max window doubleclick 'p Unity->Max_Control' (see below)



9. Click on 'connect localhost 32003' (see below)



10. Go to Unity window and fall from the platforms by going right
11. Enjoy the music
12. Got Max window and read the instructions
13. On Unity window, stop play and check 'JitMessenger.cs' that is attached to 'Char'
    - see lines 61-65
    - see lines 45-56

Notes: The output from Max can be used for creating installations as there is hardware (micro controllers, USB-based interfaces) that can talk to Max.

Note: The Unity3D – MAX/MSP/Jitter Interoperability Kit has been developed by Digital Interactive Sound & Intermedia Studio (http://disis.music.vt.edu/) group from Virginia Tech. The whole kit can be downloaded from: http://ico.bukvic.net/Max/mu_1.00.zip