Getting Started *Python Scripting* with *decod.es*

Programs Involved:

- ***Rhino 5.0***

- ***Grasshopper 1.0*** – this is a free plugin for Rhino 5.0 on Windows which effectively turns Rhino into a reasonably powerful parametric modeler. We will use this for demonstration purposes. Note that Grasshopper is not supported in Mac OSX.

- ***decod.es*** – this library is a stand-alone computational geometry library written in Python. Scripts can be opened in Grasshopper (if working on the Windows side) or as standalone scripts (if working on the Mac side).

Installation Instructions:

If working in Windows:

1. Download the latest version of ***Rhino 5.0*** at http://download.rhino3d.com/rhino/5.0/wip,

2. Download ***Grasshopper*** at http://www.rhino3d.com/download/grasshopper/1.0/wip. Note that versions that run on Rhino 4.0 are available but are no longer updated or supported.

   To tell if you have Grasshopper installed correctly, start up Rhino 5.0 and type "Grasshopper" into the Rhino command line. If something starts up, good!

3. To enable ***Python scripting*** using the ***decod.es*** library, you will need to have the two files (GhPython.gha, DcPython.gha) as well as the folder "decodes"[1]. These will be installed in two places as detailed below.

   - Navigate to the following location on your computer:

     C:\Users\[Your_Name]\AppData\Roaming\Grasshopper\Libraries

     OR

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1   Make sure that your unzipped decodes folder is not a "folder within a folder", meaning that when you open up the decodes file, there should not be another folder called "decodes" there. If there is, remove the outer layer.

a. Start Grasshopper

b. From the Grasshopper Menu, select File->Special Folders->Components Folder

Copy the two files as well as the folder "decodes" into this location

- Navigate to the following location on your computer:

C:\Users\[YOUR_NAME]\AppData \Roaming\McNeel\Rhinoceros\5.0\Plug-ins\IronPython (814d908a-e25c-493d-97e9-ee3861957f49)\settings\lib

OR

a. From Rhino, launch the built-in Python editor by typing "EditPythonScript" from the command prompt. The Python Script Editor window should open.

b. From the Python Editor menu, select Tools → Options. A Dialog box will display listing a number of folders under the heading "Module Search Paths". Double click on the folder that looks most like the folder

G:\[YOUR_NAME]\AppData\Roaming\McNeel\Rhinoceros\5.0\Plug-ins\IronPython

Copy the folder "decodes" into this location. (yes, this folder gets copied into two places)

To test that everything has worked,

1. Go into Grasshopper, and click on the "Maths" tab. You should see a collection of components called "Decodes" on the left hand side. Drag a decodes script component (the pink "d") onto the canvas.

2. Double-click anywhere on the Decodes component to open the Decodes Python Editor

3. Type the script

```
print "cross your fingers"
pt = Point(5,0,0)
a.put(pt)
```

4. Does the Decodes component turn gray or green (or any color other than red?) and do you see an "x" marking a point in the Rhino window? Good.

If working on the Mac side:

Remember on the Mac side, Grasshopper is not supported but you can still script using the decod.es library using the Rhino Python interface.

1. Download **Rhino 5.0 for OSX** at http://www.rhino3d.com/download/wenatchee/5.0/wip

    The latest version now comes with **Python scripting** enabled. Check this by typing "RunPythonScript" in the command window. Navigate to the script "HelloPython.py" in the default scripts folder. If this opens and no error shows up, proceed.

2. To enable Python scripting with the **decod.es** library, navigate to the following folder (this is a hidden folder so this is easiest to do in Terminal):

    Library/Application\ Support/McNeel/Rhinoceros/MacPlugIns/IronPython/settings/lib

    Copy the folder "decodes"[2] into this location

3. Now let's test this out by creating a decodes script[3]. In your script editor, write the following:

```
import decodes
from decodes.core import *
outie = decodes.make_out(decodes.Outies.Rhino)

print "cross your fingers"
pt = Point(5,0,0)
outie.put(pt)
outie.draw()
```

    Save this as "test.py"

4. In the Rhino command window, write in "RunPythonScript" and navigate to the script you've just written. If you see a point on your the Rhino vewport, you're all set.

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2   Make sure that your unzipped decodes folder is not a "folder within a folder", meaning that when you open up the decodes file, there should not be another folder called "decodes" there. If there is, remove the outer layer.
3   Since there is no built in script editor for Rhino-Python on the Mac side, you will need to download one, such as Komodo Edit (free)