

BVH File Format and Scripting in Blender

BVH File Format

- ▶ Split into two sections
 - ▶ Skeleton Data
 - ▶ Identified by keyword 'HIERARCHY'
 - ▶ Describes hierarchical joint structure
 - ▶ Joint order is defined here, and used by MOTION section
 - ▶ Motion Data
 - ▶ Identified by keyword 'MOTION'
 - ▶ Includes number of frames and frame rate information
 - ▶ Sequence of frames
 - ▶ Can be seen as a huge matrix

Scripting in Python with Blender

- ▶ Everything is part of the bpy model
 - ▶ At the beginning of your script add:
 - ▶ `import bpy`
- ▶ Blender main submodules
 - ▶ **bpy.data**
 - ▶ Access to all data from your blend file
 - ▶ You can use it to access the skeleton imported in lab 5
 - ▶ `skel_obj = bpy.data.objects['131_09_60fps']`
 - ▶ In general, you either loop over all datablocks, or get a specific item by name
 - ▶ **bpy.context**
 - ▶ Contains data in the current active view
 - ▶ It is context sensitive, it depends on the selections you make, your active object and so on
 - ▶ It can be useful when creating a camera
 - ▶ **bpy.ops**
 - ▶ Tools that typically operate on **bpy.context**

```
import bpy

# Create object and camera (will switch focus to new object)
bpy.ops.object.add(
    type='CAMERA')
# Get object that has just been added
new_cam = bpy.context.object
new_cam.name = 'cam1'
```

Concepts to keep in mind

- ▶ Blender has the concept of
 - ▶ Scene
 - ▶ Reference Objects
 - ▶ Object
 - ▶ Reference Object Data (Mesh, Armature, Lamp. etc)
 - ▶ Do not get them mixed up
 - ▶ This allows you to have many instances of the same armature, which saves memory and allows you to edit without having to manually update copies.

```
import bpy
arm = bpy.data.armatures.new('SomeName')
# create an object
obj = bpy.data.objects.new("SomeObject", arm)
```

Important Resources

- ▶ Blender API (≥ 2.5)
 - ▶ Official Documentation
 - ▶ http://www.blender.org/api/blender_python_api_2_64_1/contents.html#
 - ▶ Code snippets (including camera creation)
 - ▶ http://wiki.blender.org/index.php/Dev:2.5/Py/Scripts/Cookbook/Code_snippets/Other_data_types
- ▶ Only if you are working with MotionBuilder
 - ▶ Official Documentation
 - ▶ <http://download.autodesk.com/us/motionbuilder/sdk-documentation/PythonSDK/namespacepyfb SDK.html>
 - ▶ Easy to follow scripting tutorials
 - ▶ <http://awforsythe.com/tutorials>