

Final Review

Character Rigging

Ke Rong
03772442
3D Animation

Contents

| | |
|---------------------------|----|
| ● Table of Contents | 02 |
| ● Biography | 03 |
| ● Resume | 04 |
| ● Reel | 06 |
| ● Abstract | 07 |
| ● Project A | 08 |
| ● Project B | 18 |
| ● Project C | 26 |
| ● Project D | 31 |
| ● Timeline | 37 |
| ● Complete Class | 41 |

Biography

I am Ke Rong. I am from China. I love animation and film. I'm an enthusiastic and passionate person concentrates on 3D animation, rigging field. I actively improve my professional skills and the ability of problem solving.

Before I came to Academy of Art University, I didn't know what is rigging and I didn't know how to use Maya. But I learned many things about animation, including traditional animation, character design and film language. I am a person who would like to try new things, so I decided to learn rigging. I'm curious about rigging. After I learned rigging, I realized that I really love the feeling of solving problems.

I like digging animation techniques and the related area. I would like to play with Maya, play with code to figure out the solution.

Resume

● Rigging Experience

Technical Artist (February 2016 - Present)

Chronicles of Drasil, PC game collaborative project

- 180 New Montgomery Street, San Francisco, CA 94105, United States
- Create character and prop rigs for PC game collaborative project
- Support character artists and animators to solve technical issues
- Test game assets in Unity game engine

Character Rigging Intern (May 2015 - July 2015)

Immersed Games

• 802 NW 5th Avenue, Suite 100, Gainesville, Florida 32601, United States

- Create character rigs for 3D game, Tyto Ecology
- Support animators to solve technical issues

Character TD (September 2014 - Present)

Wake Up, animated short film

- 180 New Montgomery Street, San Francisco, CA 94105, United States
- Create all character rigs and prop rigs
- Support the animator to solve technical issues

Character TD (September 2014 - March 2016)

Pig ZZ, animated short film

- 180 New Montgomery Street, San Francisco, CA 94105, United States
- Create body rig and facial rig for character
- Support the animator to solve technical issues

Character Rigger (September 2014 - December 2014)

Buddy & Russell, animated short film

- 180 New Montgomery Street, San Francisco, CA 94105, United States
- Create body rig and facial rig for character
- Support the animator to solve technical issues

● Scripting Experience

Quadruped Auto Rig (September 2015 - Present)

- Python tool that can automatically create a rig for quadruped character.

Mirror or Combine Blend Shape (December 2015)

- Python tool that can automatically mirror blend shape from left side to right or combine to different blend shapes to create a new one.

FBX File Exporter (February 2015)

- Python tool that can automatically clean name space, mesh and control curves, then bake animation in Maya, export as a FBX file

Control Creator (February 2014 - May 2014)

- Create a python script to generate animation controls for improving working efficiency

● Technical Skills

- Create hierarchical rig for 3D model
- Create full facial rig for 3d character
- Paint skin weights properly
- Blend shapes building
- Python scripting
- MEL scripting

● Software

- Autodesk Maya
- Adobe Photoshop
- Adobe After Effects
- Adobe Premiere Pro
- ZBrush
- QT Designer

Resume

● Contact Information

First Name: Ke **Phone Number:** 415-746-0701

Last Name: Rong **Home Address:** 905-F, Avenue B, San Francisco, CA 94130

Email Address: rongkegood@gmail.com

● Education

Fall 2007 -Summer 2010, persuing the graduation certification, majoring in Animation

College Name: the College of Film and Television, in Zhongyuan University of Technology

Fall 2010 - Summer 2012, persuing the Bachelor of Arts, majoring in Animation

University Name: Henan Liberal Arts University (Nanyang Normal University)

Fall 2012 – Spring 2016 persuing the Master of Fine Arts

majoring in 3D Animation, Character Rigging

University Name: Academy of Art University

KE RONG

Character Rigging Thesis
showreel

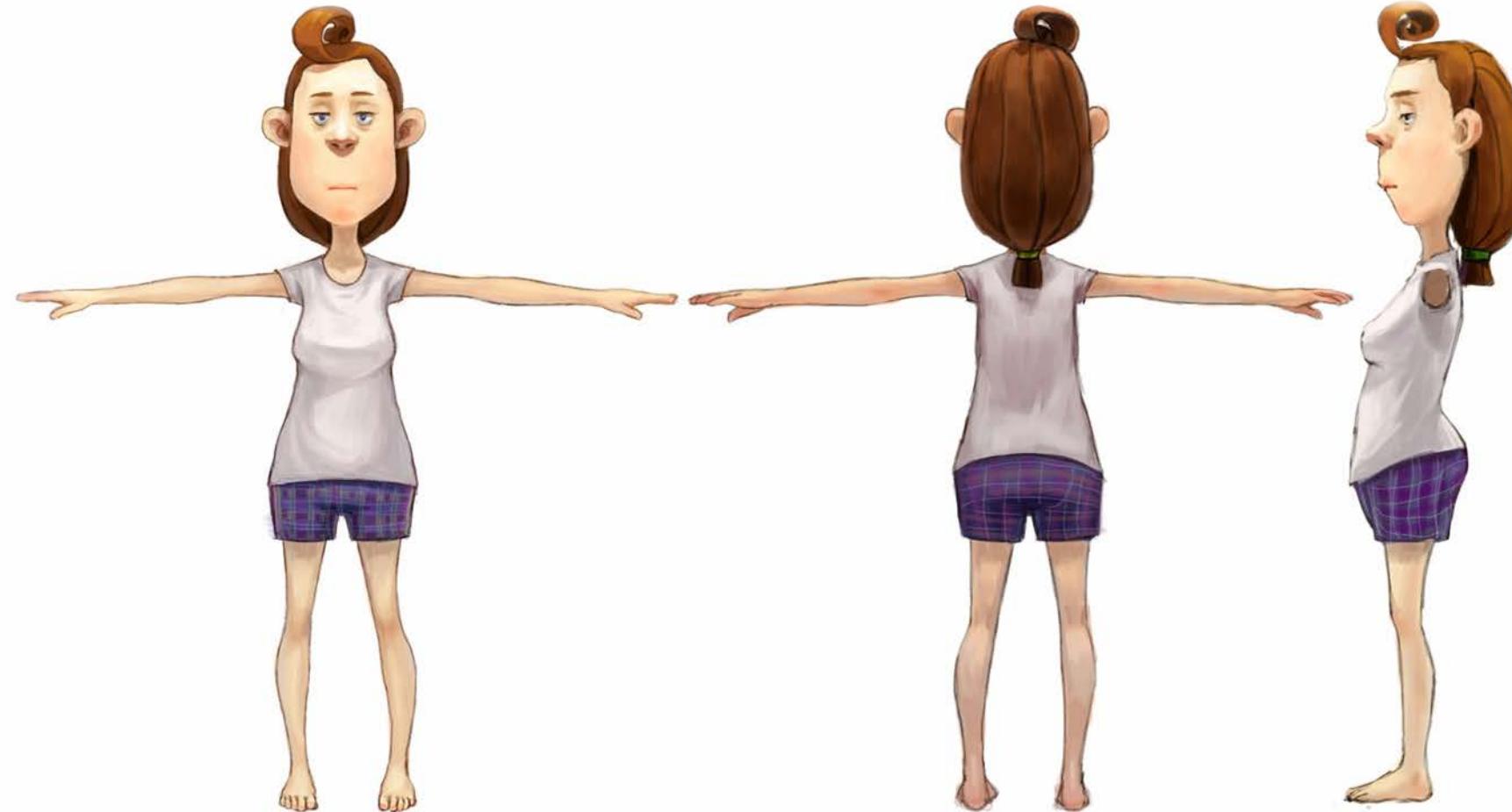
Student ID 03772442

Abstract

My final thesis contains four projects, three rigs and one script.

- A human rig. The character is a cartoony human. This rig contains the full facial rig. This character is for an animated shot film, Wake Up, directed by Jingyi Chen.
- A pig rig. The character is a cartoony with secondary control for enhancing deformation. Also, it has the full facial rig. This character is for an animated shot file, PigZZ, directed by Jiansong Zhao.
- A bat rig. This character is realistic style. For creating natural wings of the bat, this rig contains the nCloth system. This is my personal project.
- An auto-rig script for quadruped. It can be used on different types of quadruped. It can improve the efficiency of rigging quadruped.

Project A Human Rig Character design

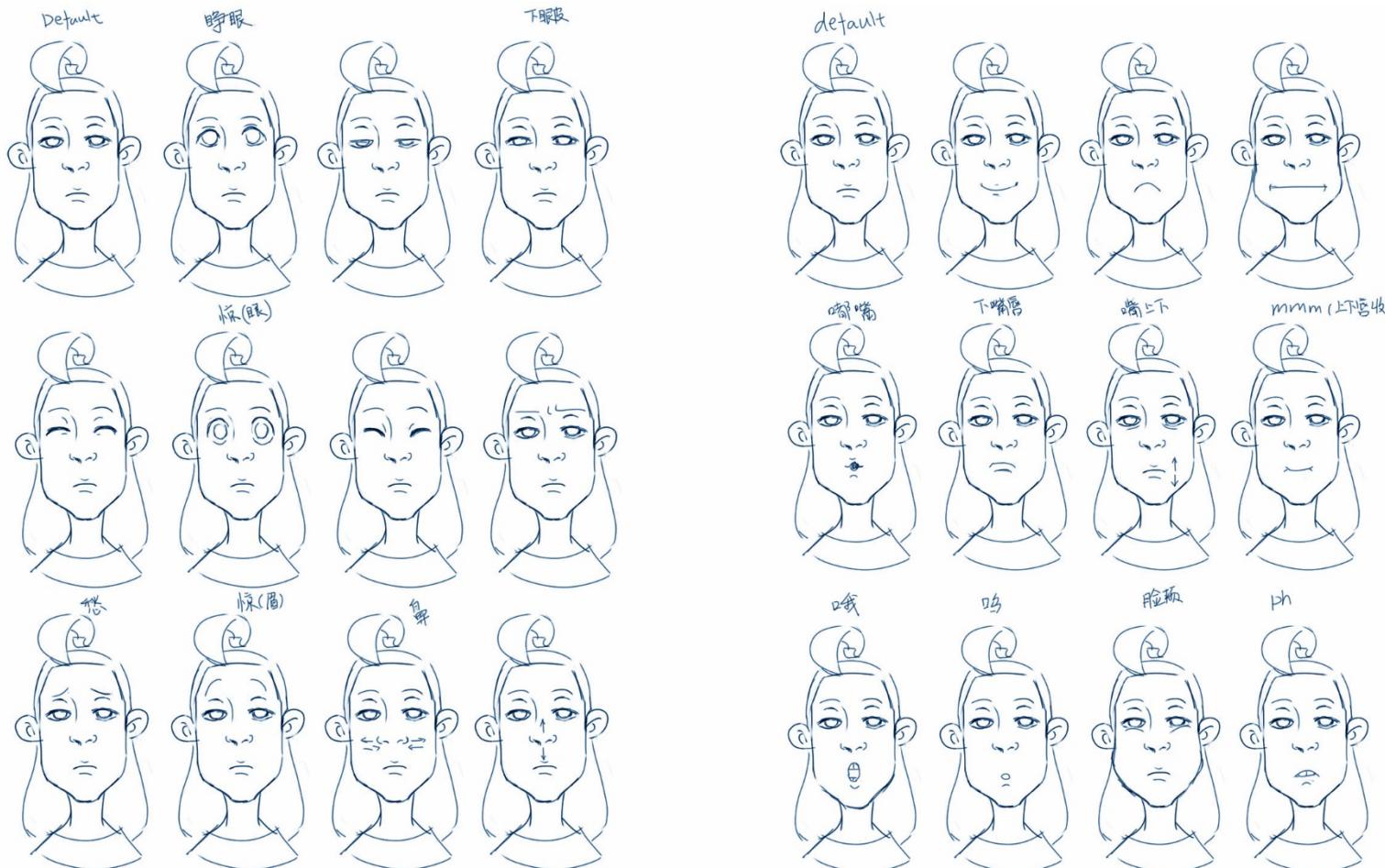


Wake Up Project

Created by Jingyi Chen

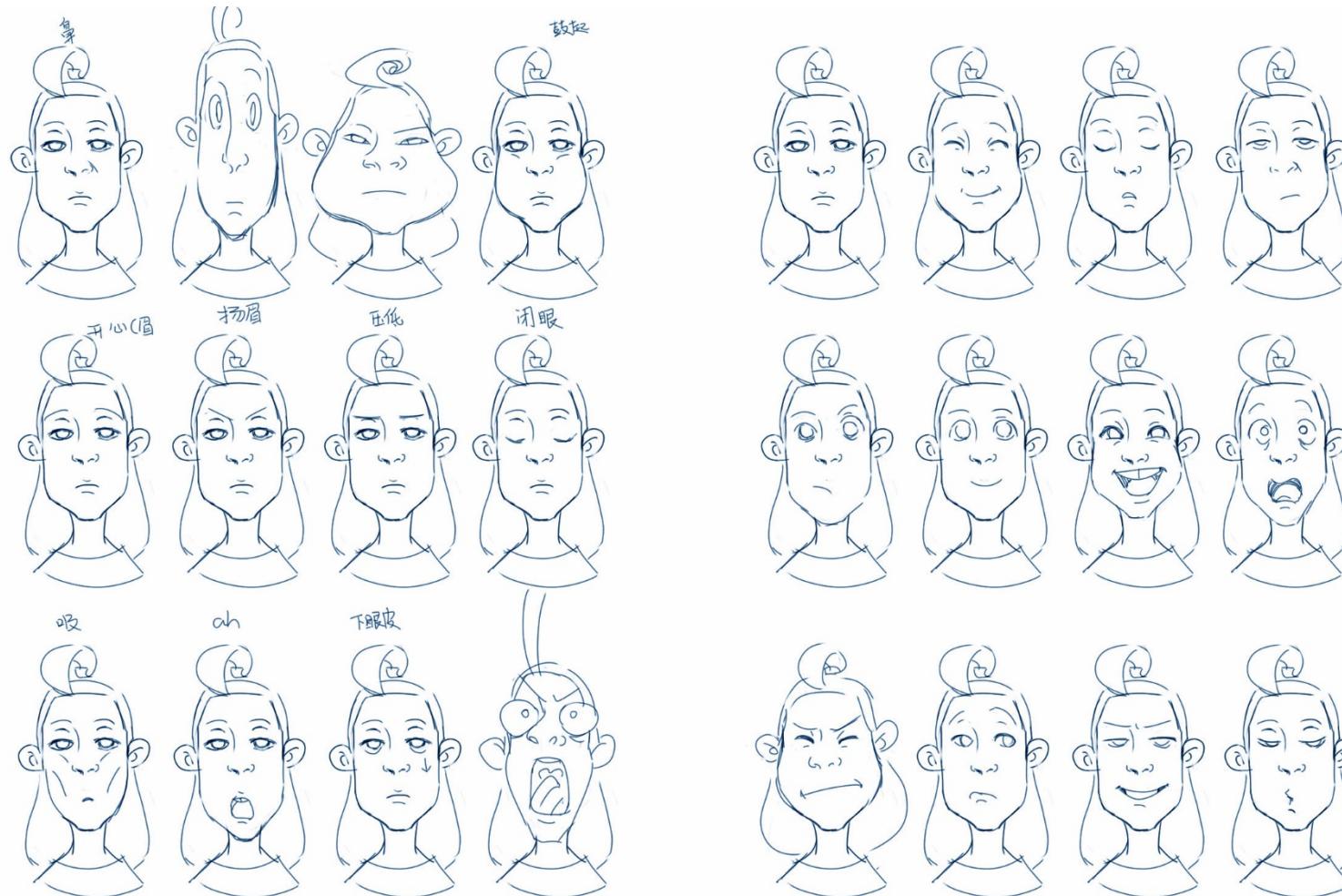
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Project A Human Rig Facial expressions



Created by Jingyi Chen

Project A Human Rig Facial expressions

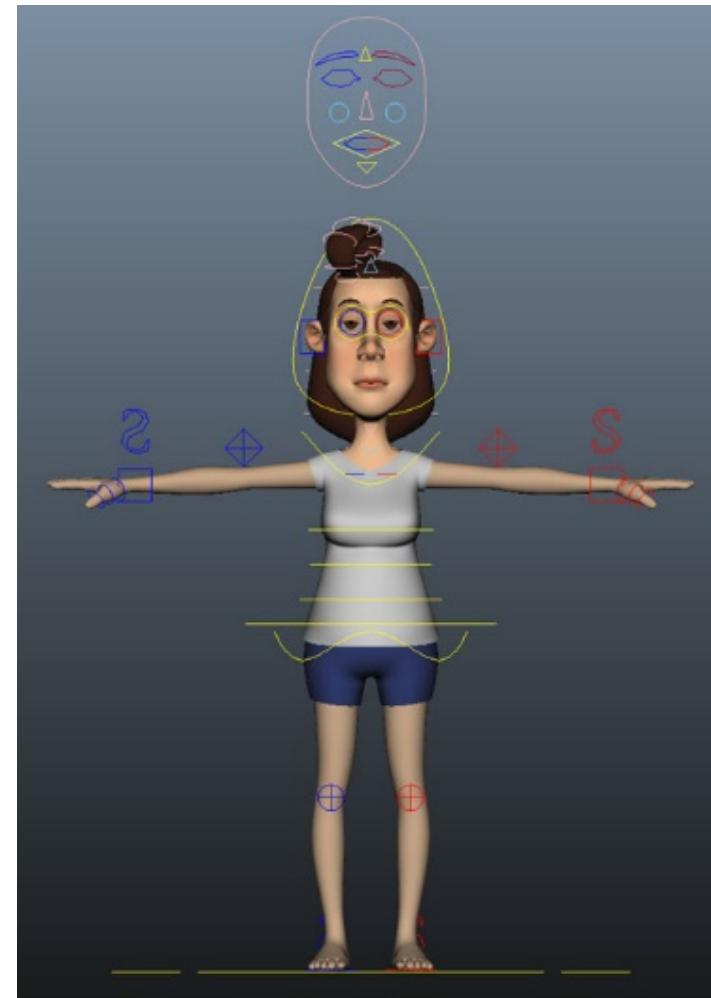


Created by Jingyi Chen

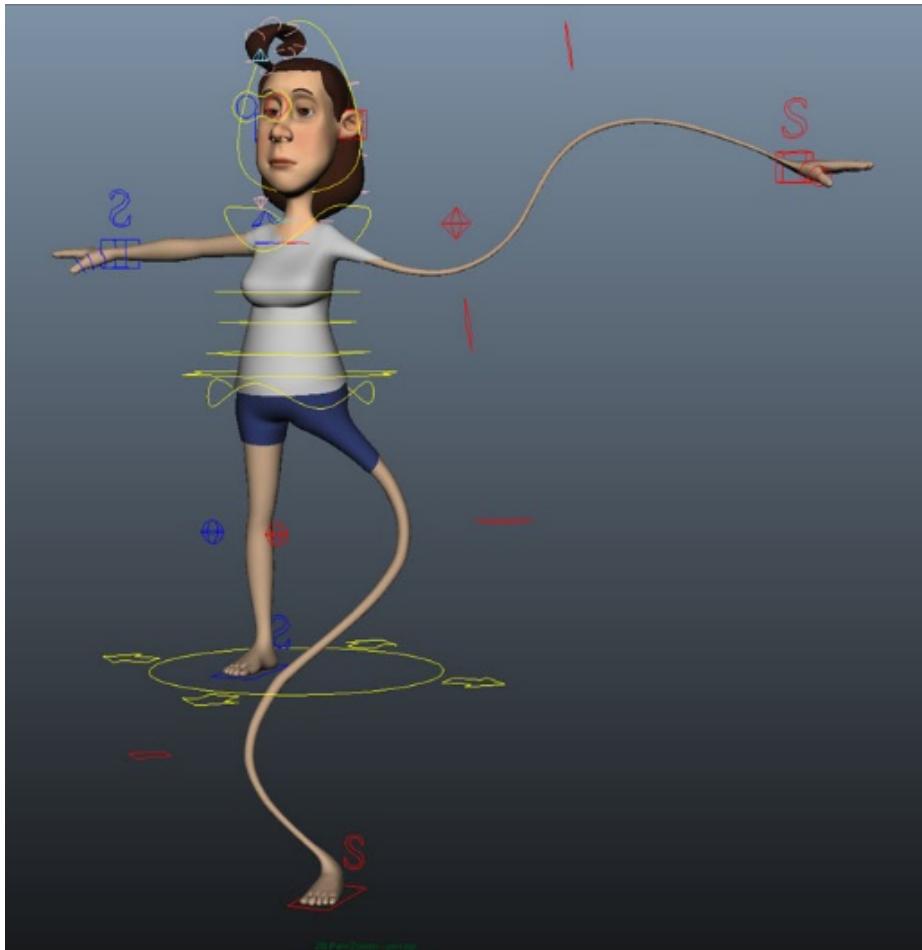
Project A Human Rig Functions

features

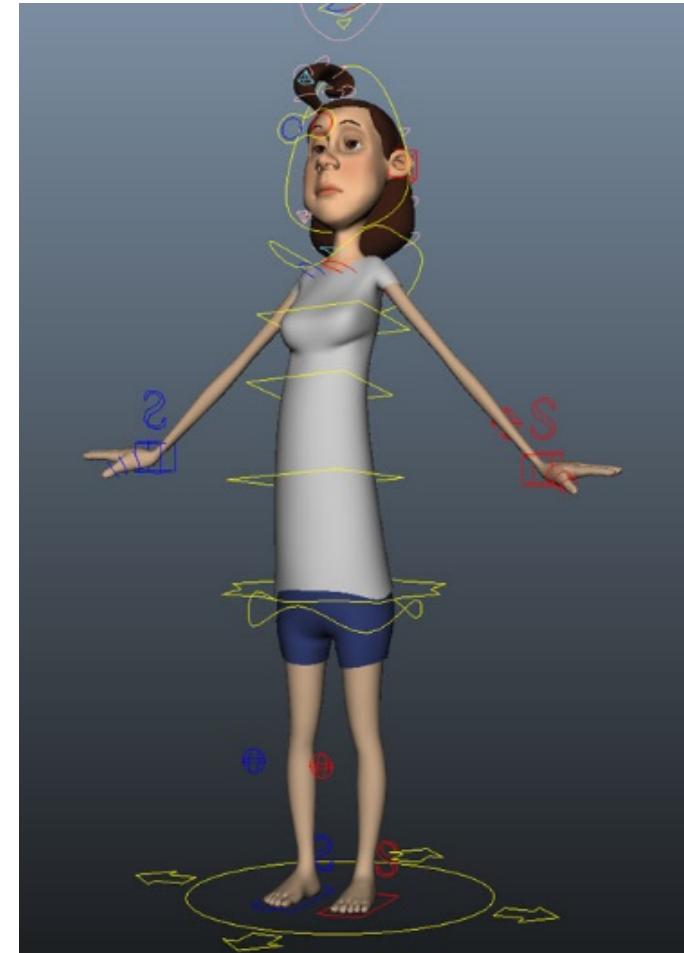
- IK/FK legs and arms
- IK/FK switch for legs and arms
- Bendy legs and arms
- Stretchy spine
- Stretchy and squashed head
- Foot roll
- Joint based facial rig
- Corrective blend shapes for facial rig
- Python facial UI



Project A Human Rig Technique

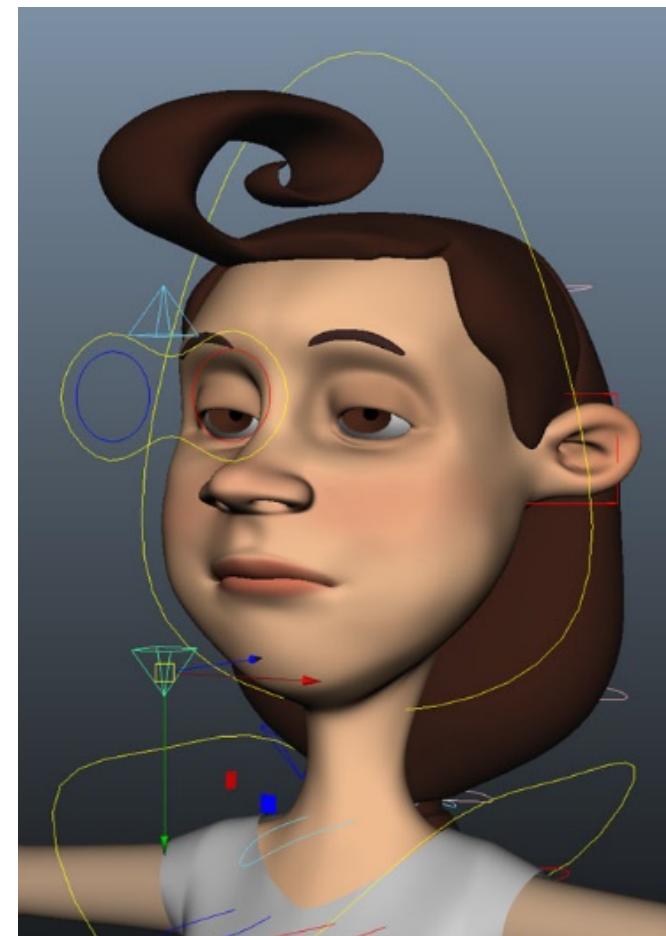
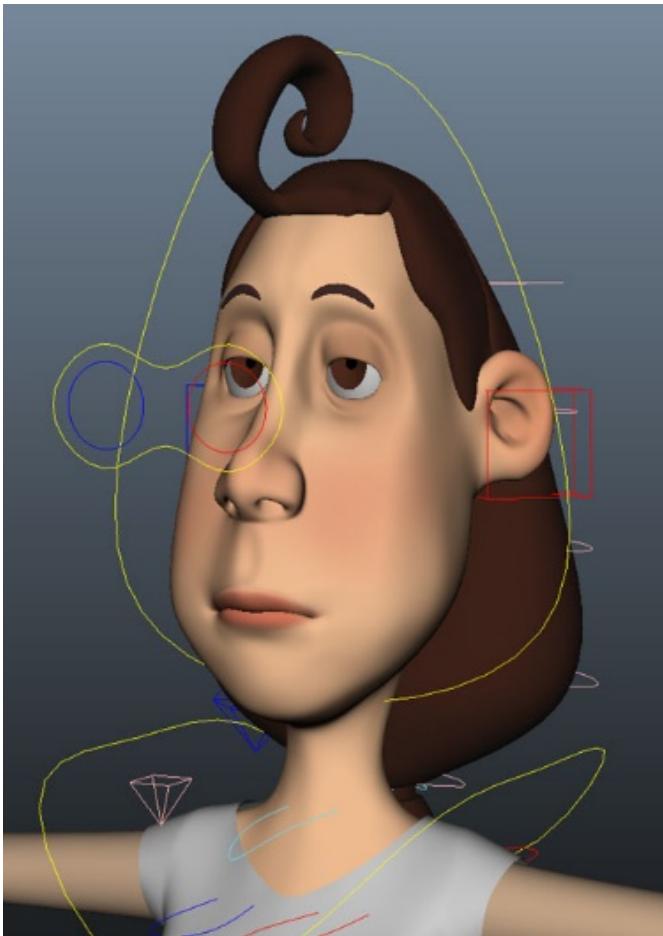


IK/FK legs and arms with stretching and bending



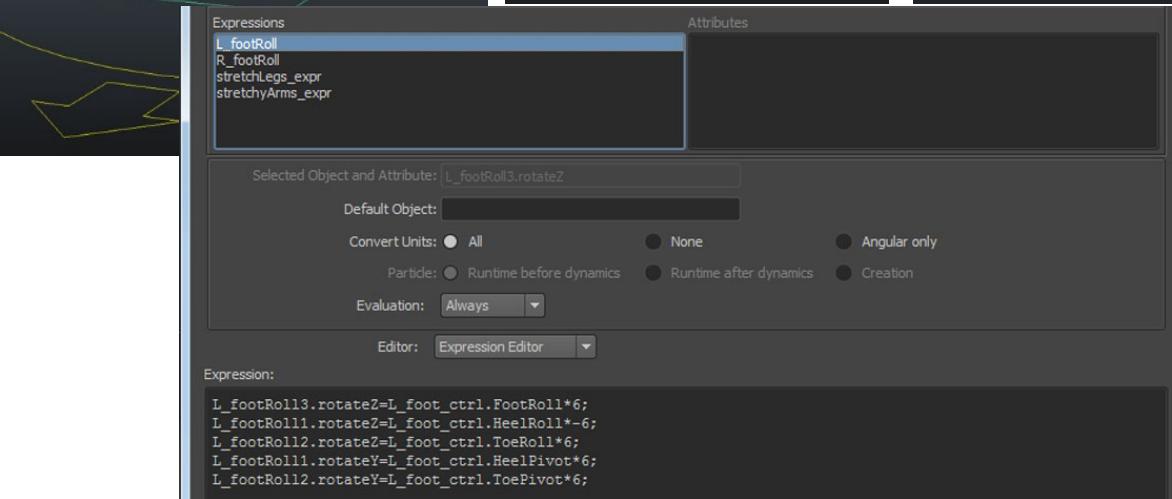
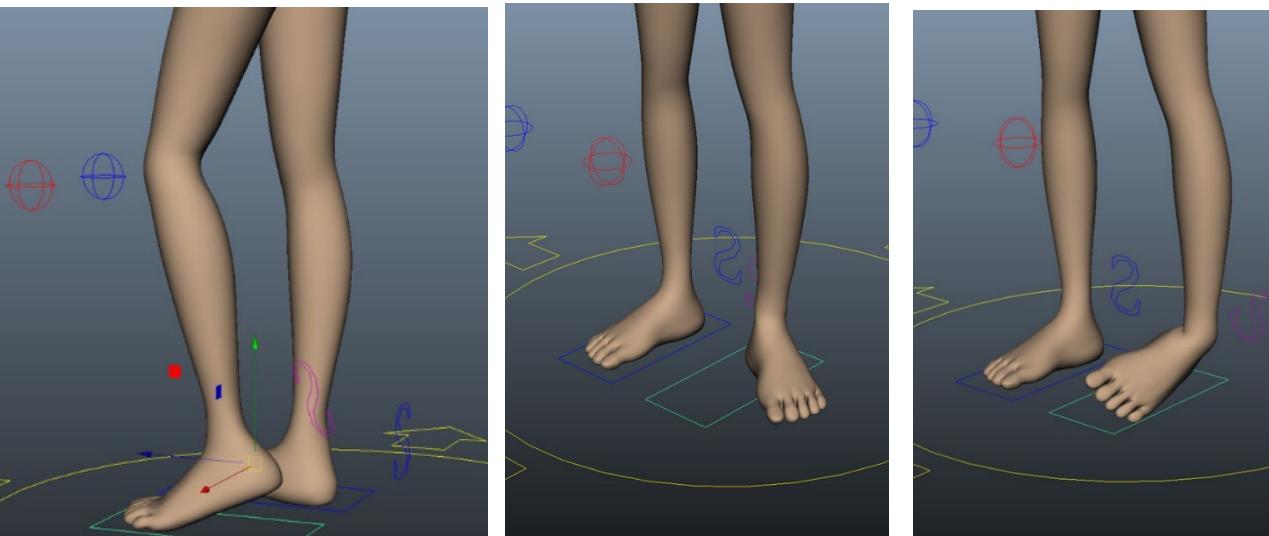
Stretchy spine

Project A Human Rig Technique

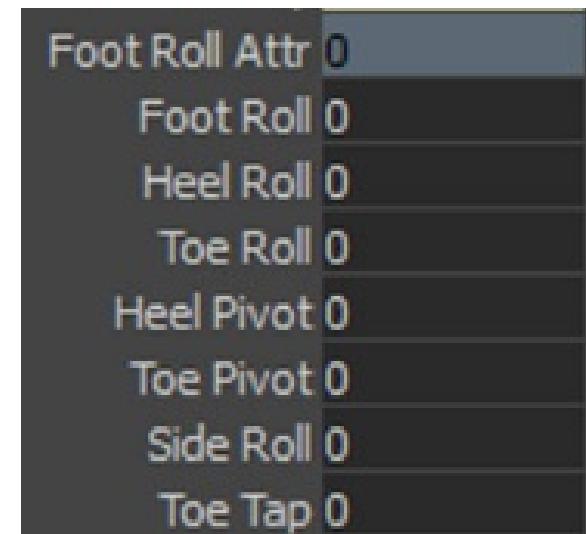


Stretchy and squashed head control

Project A Human Rig Technique

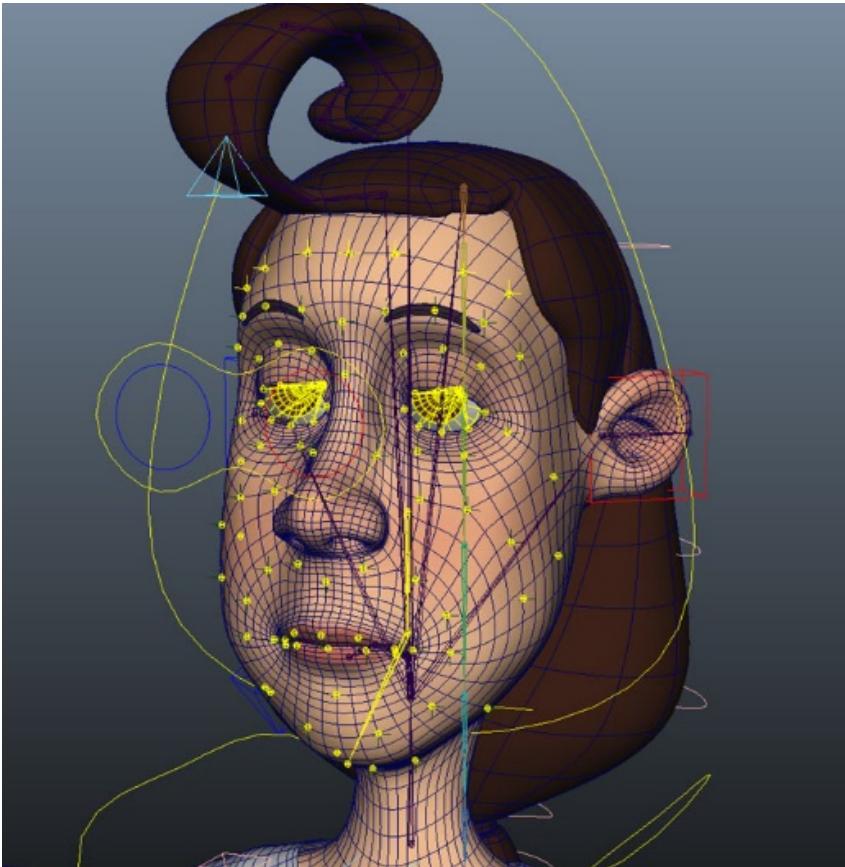


Foot roll expressions

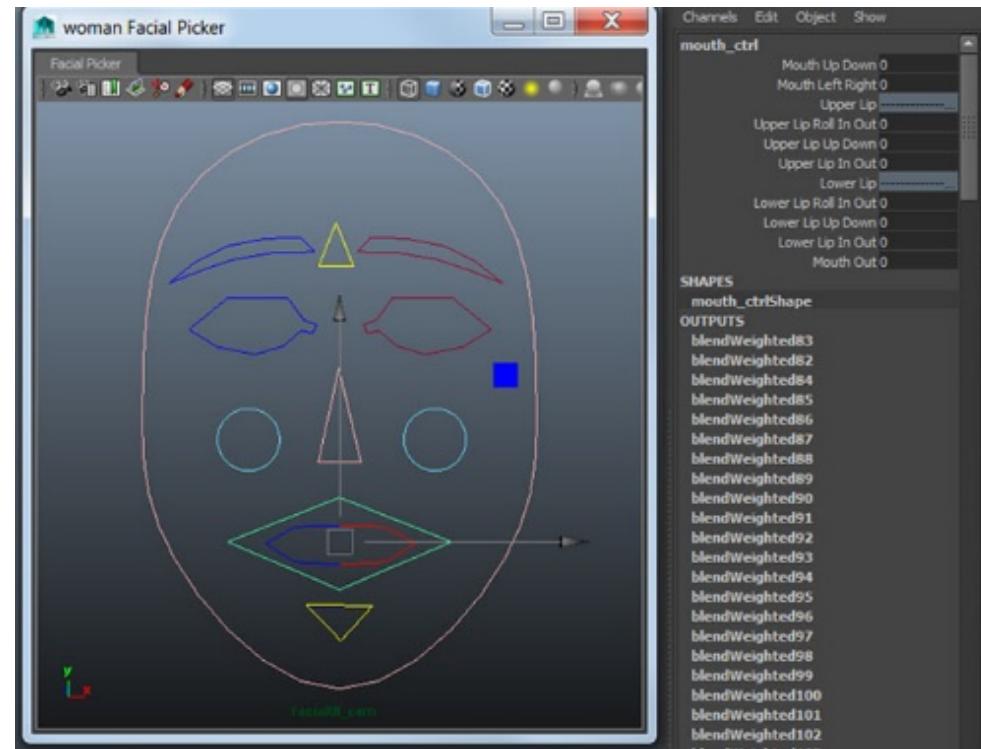


Foot roll customized attributes

Project A Human Rig Facial rig

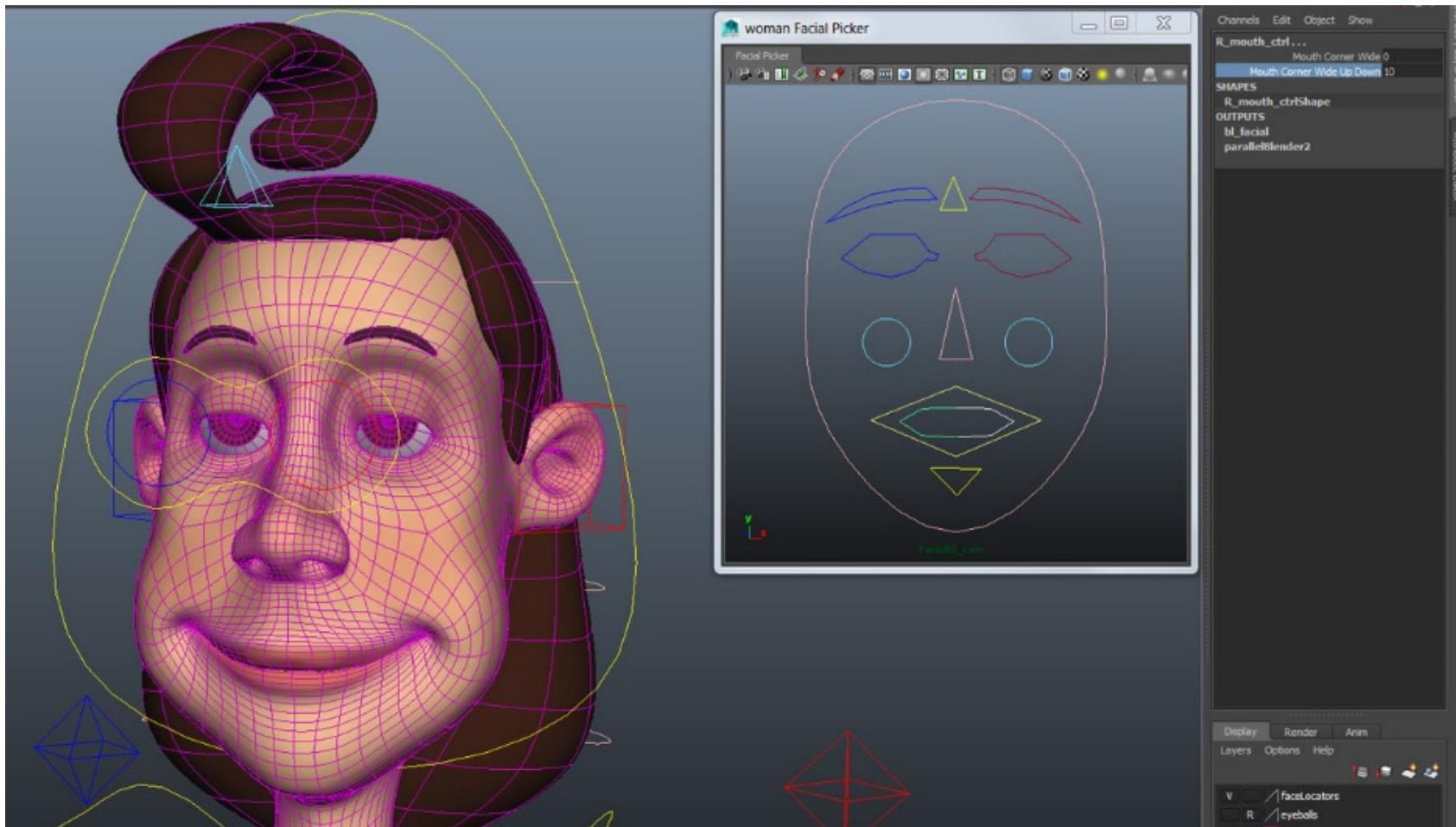


Joint placement for facial rig



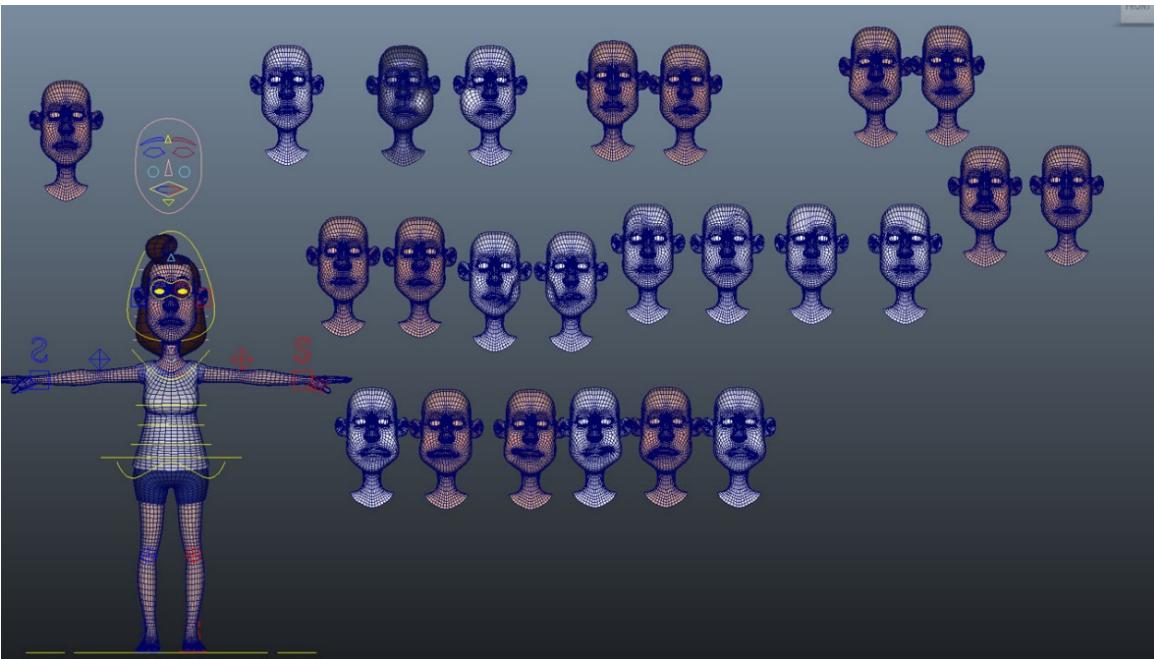
Customized attributes on facial control curve

Project A Human Rig Facial rig



Facial setup result

Project A Human Rig Facial rig

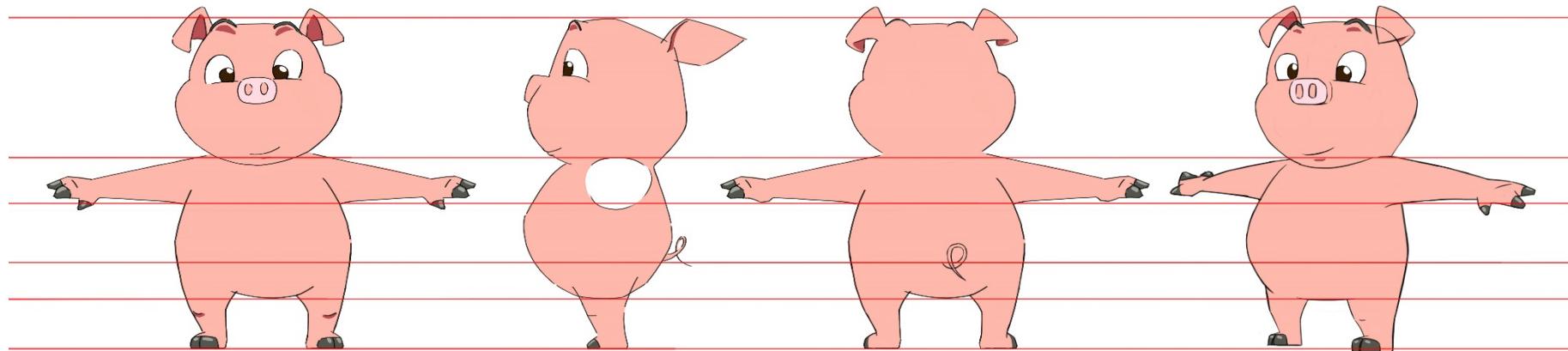


Facial blend shapes



Facial blend shape node

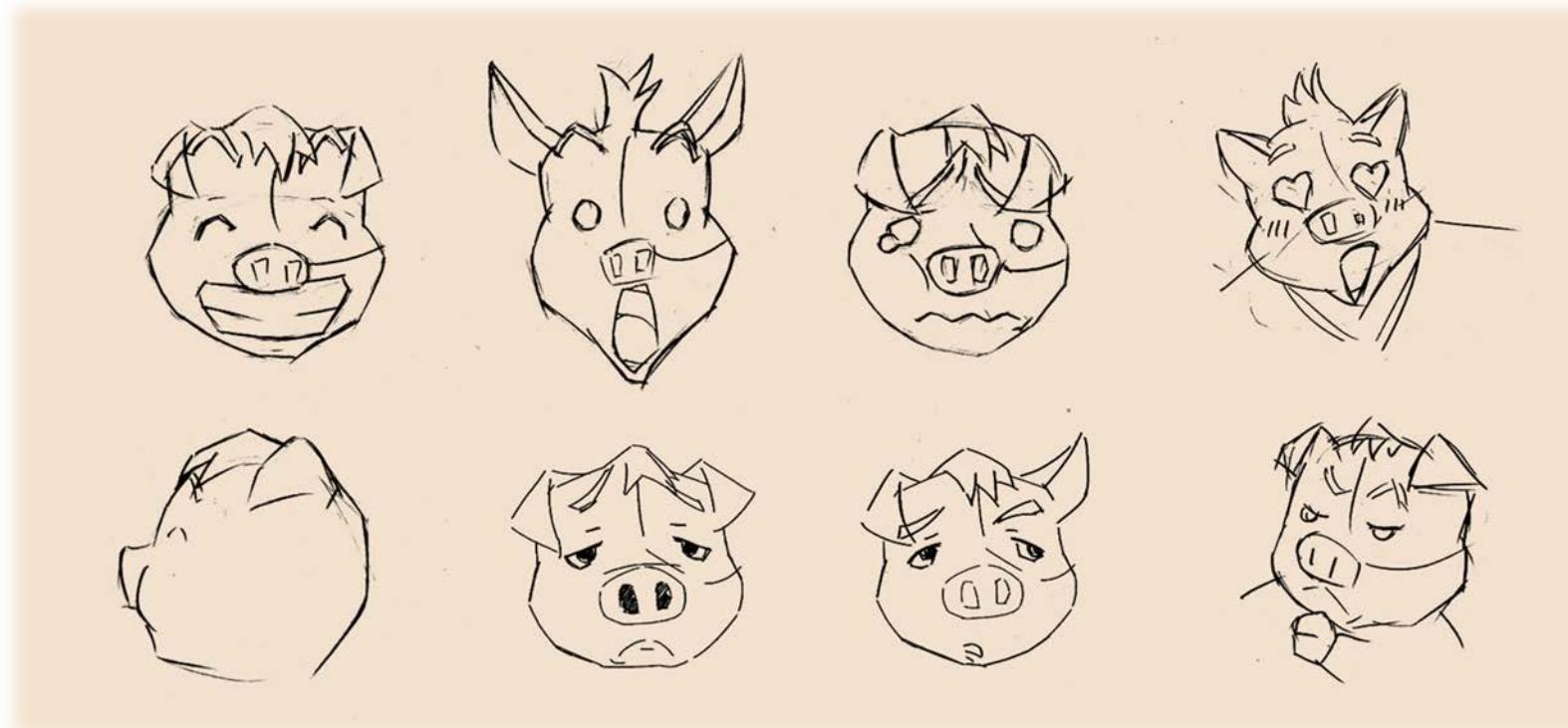
Project B Pig Rig Character design



Pig ZZ Project

Created by Jiansong Zhao

Project B Pig Rig Facial expressions

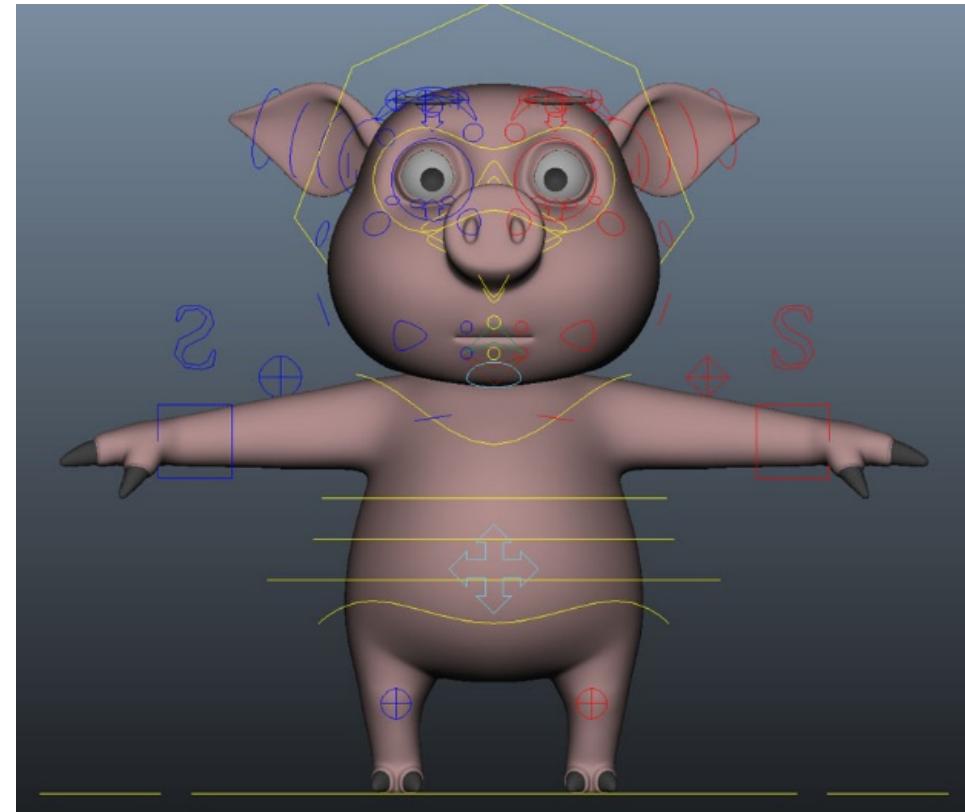


Created by Jiansong Zhao

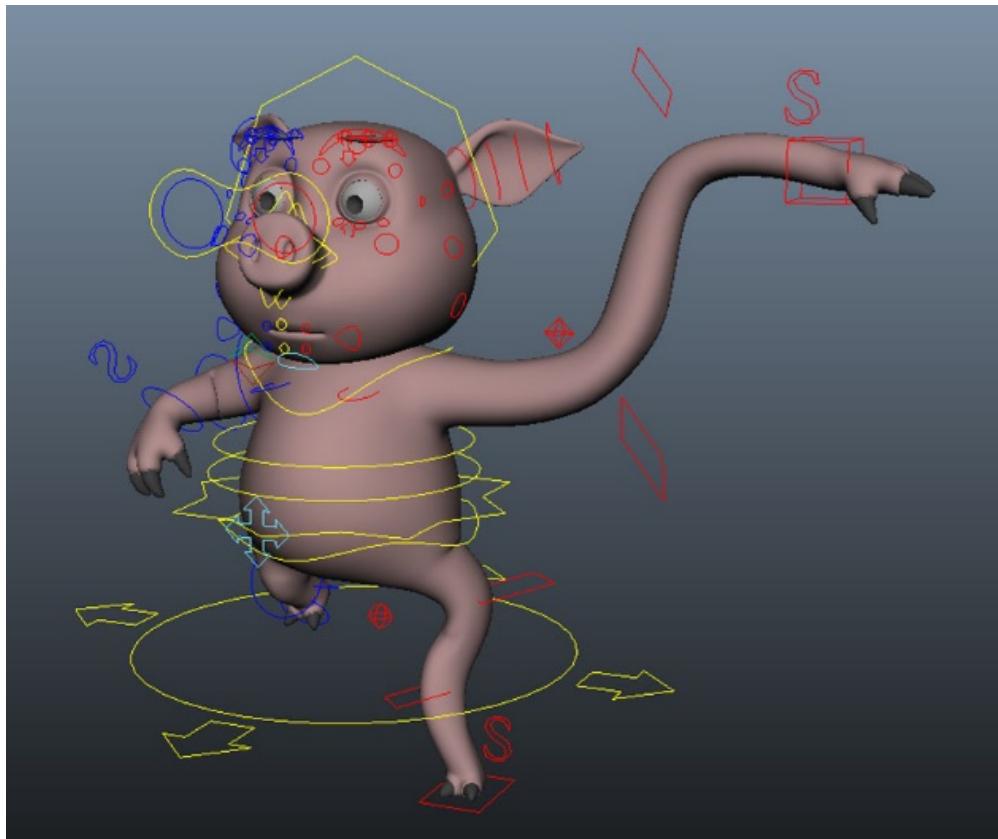
Project B Pig Rig Functions

features

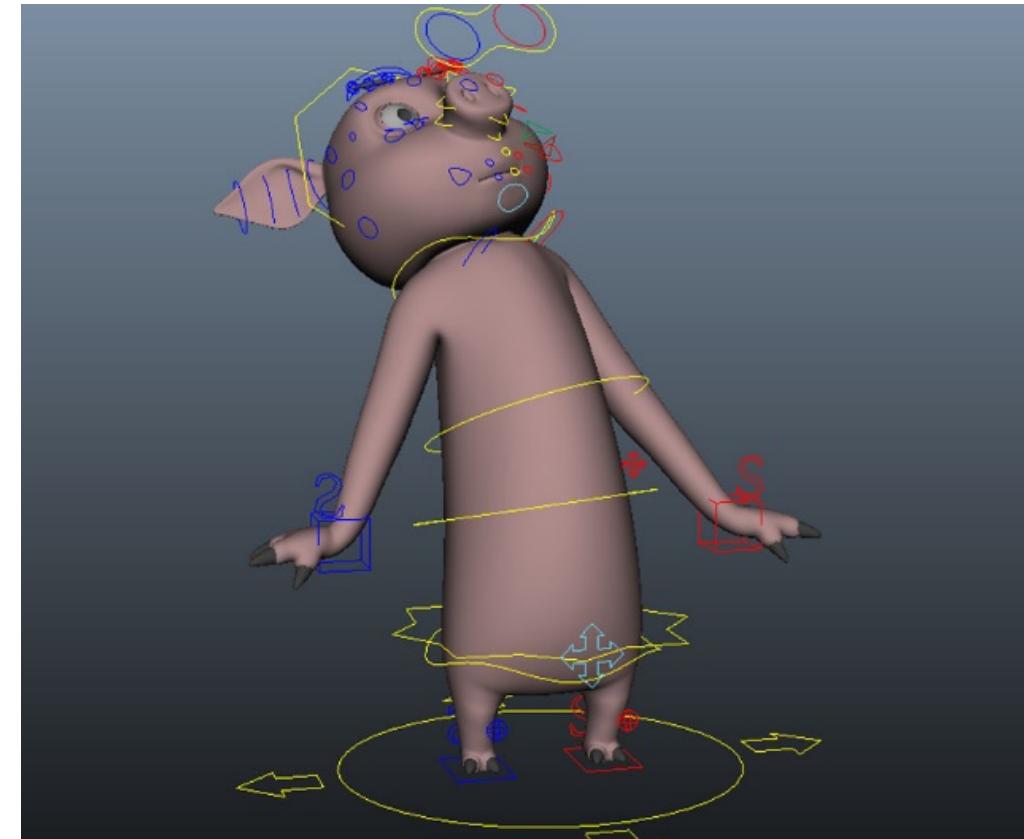
- IK/FK legs and arms
- IK/FK switch for legs and arms
- Bendy legs and arms
- Stretchy spine
- Foot roll
- Joint based facial rig
- Blend shapes for facial rig
- Manual control setup



Project B Pig Rig Technique

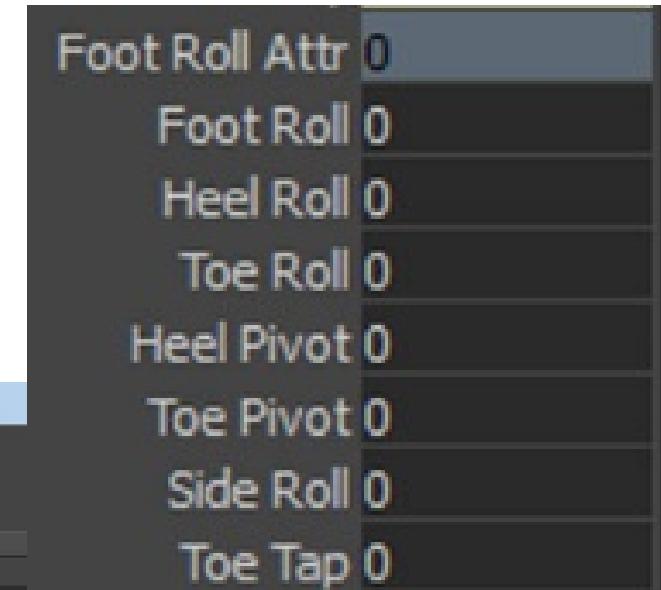
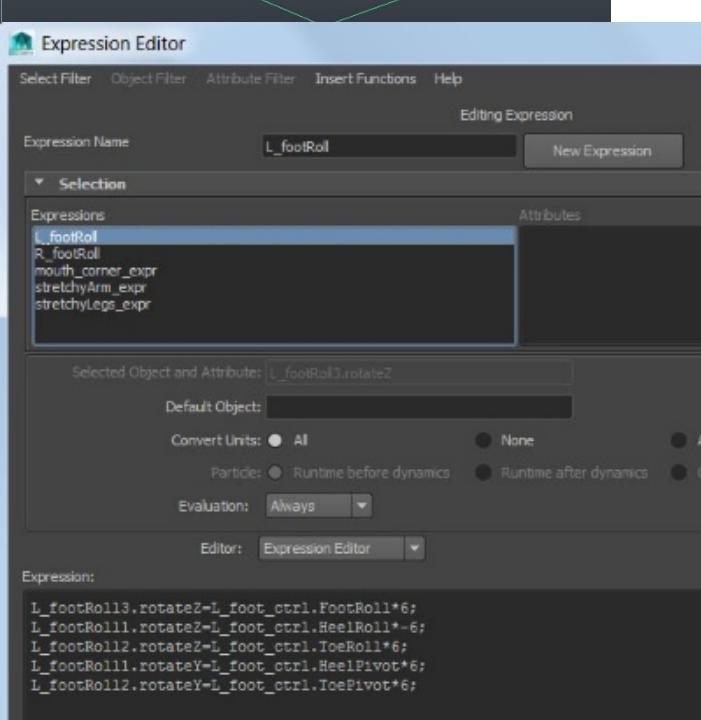
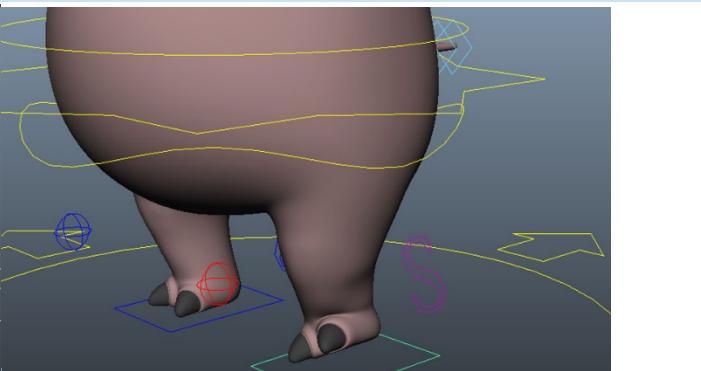
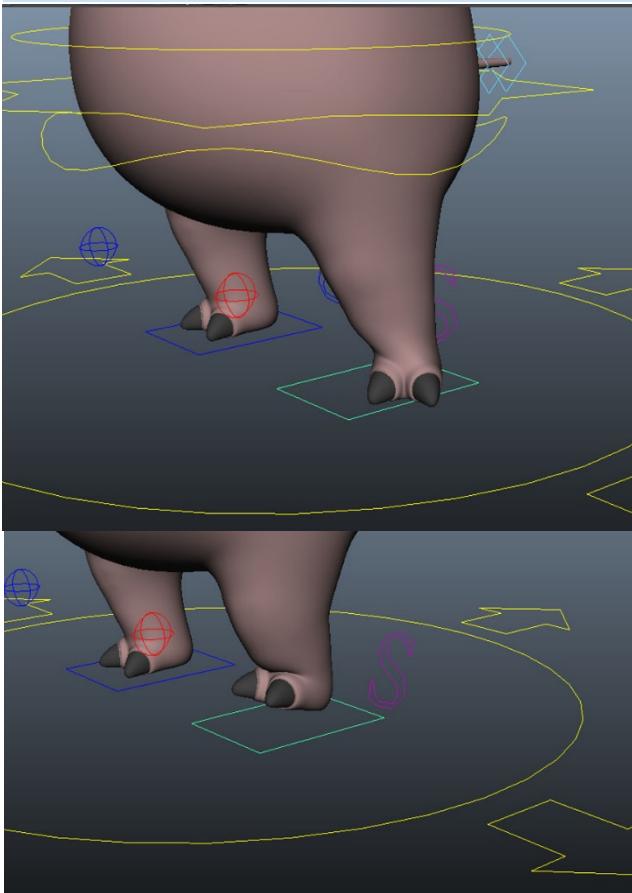


IK/FK legs and arms with stretching and bending



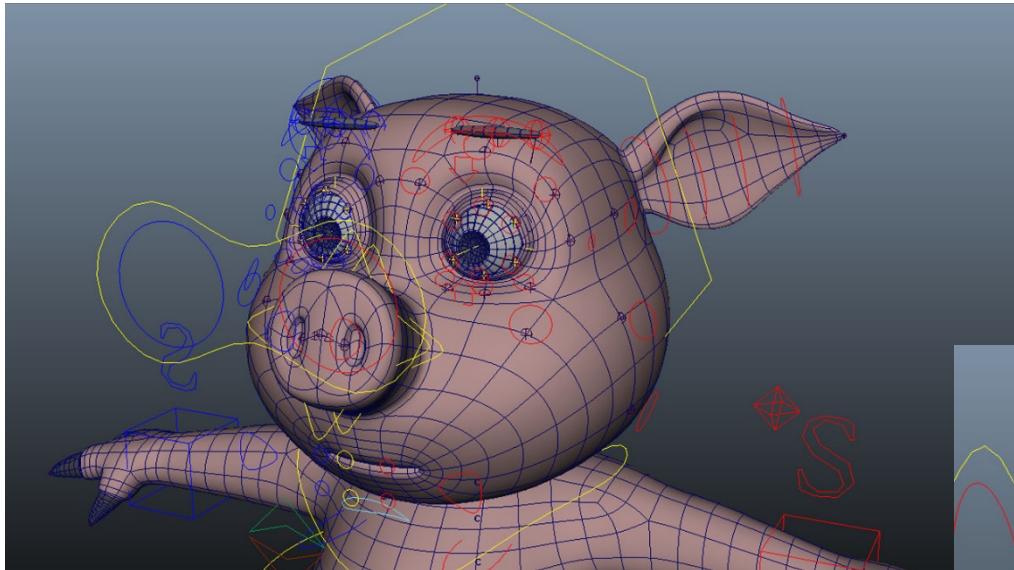
Stretchy spine

Project B Pig Rig Technique

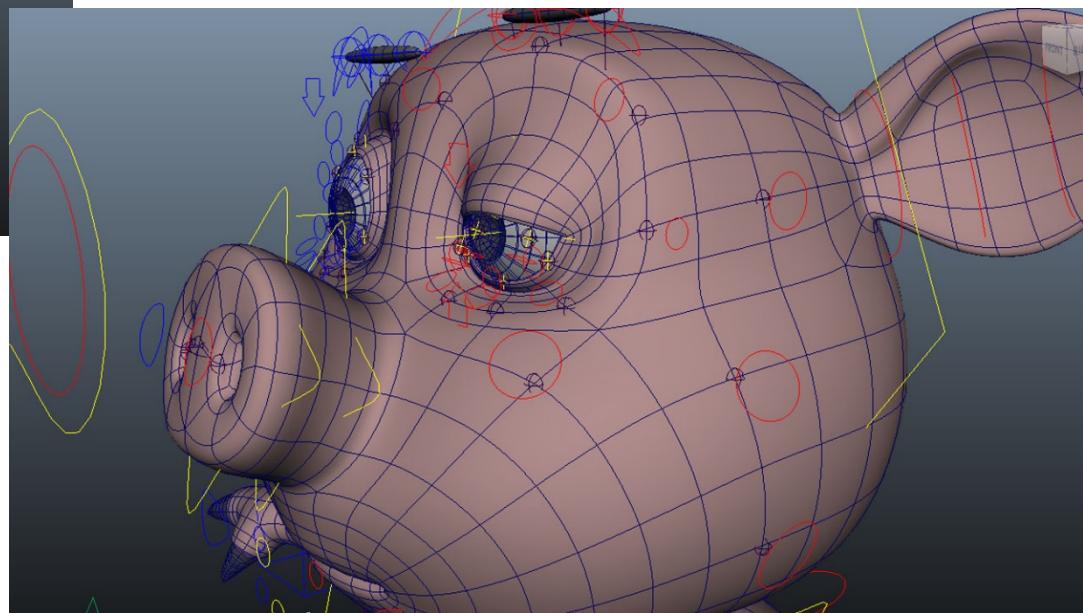


Foot roll expressions

Project B Pig Rig Facial rig

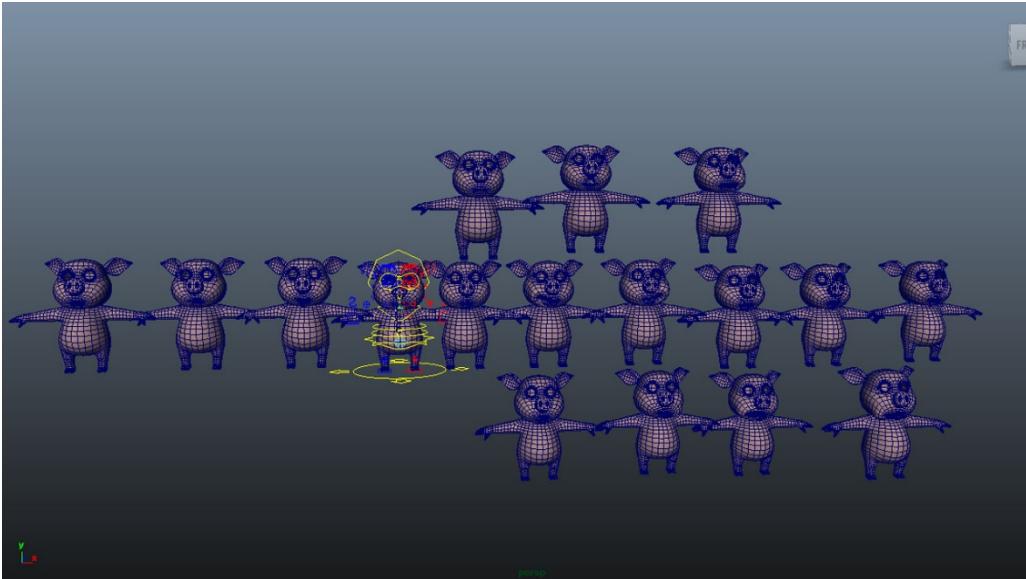


Joint placement for facial rig

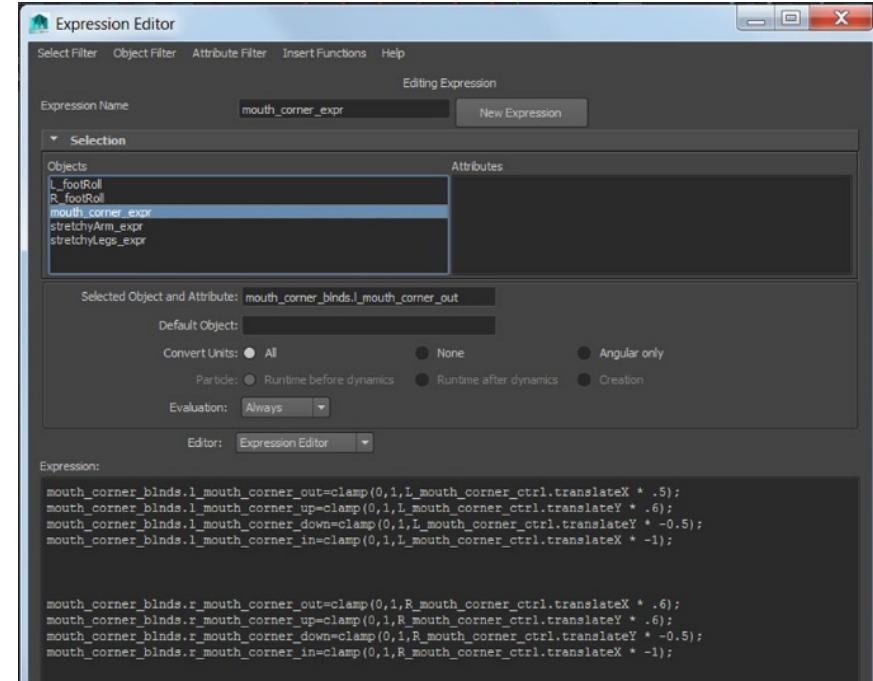


Facial setup result

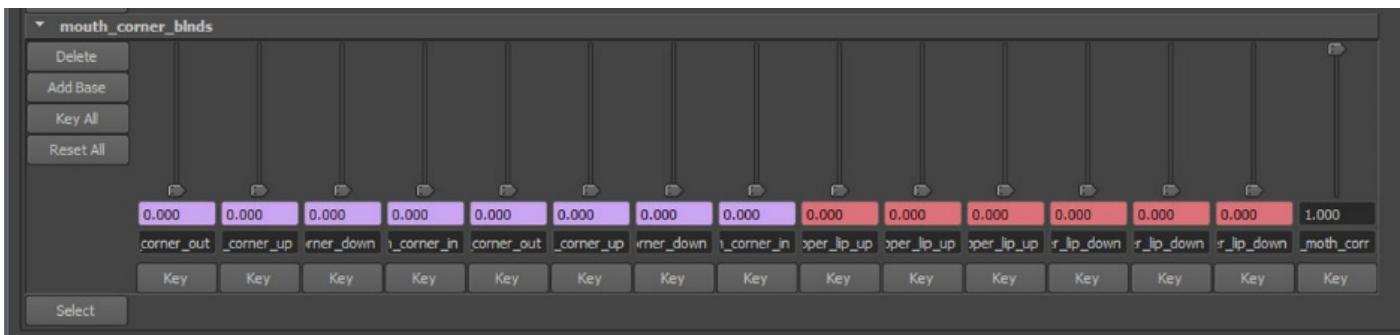
Project B Pig Rig Facial rig



Facial blend shapes

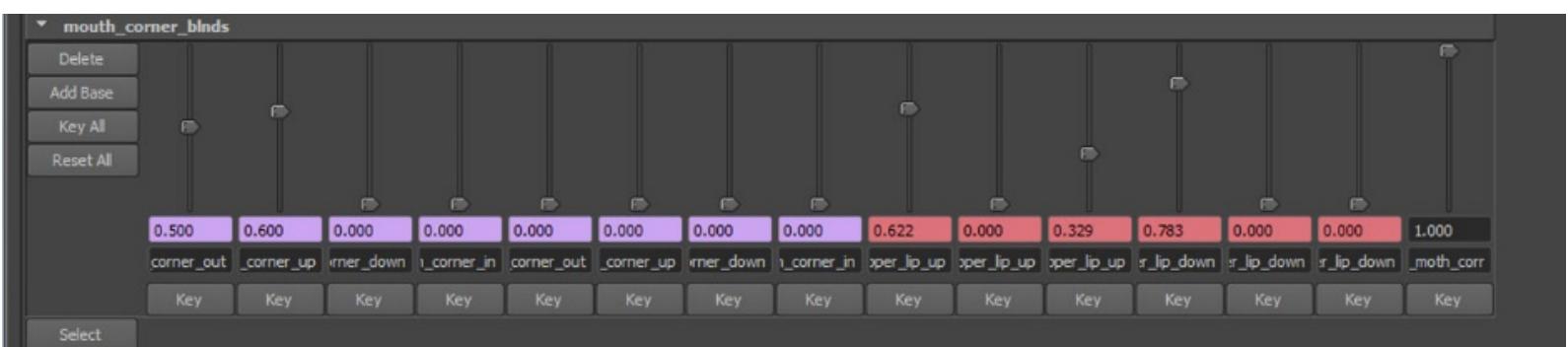
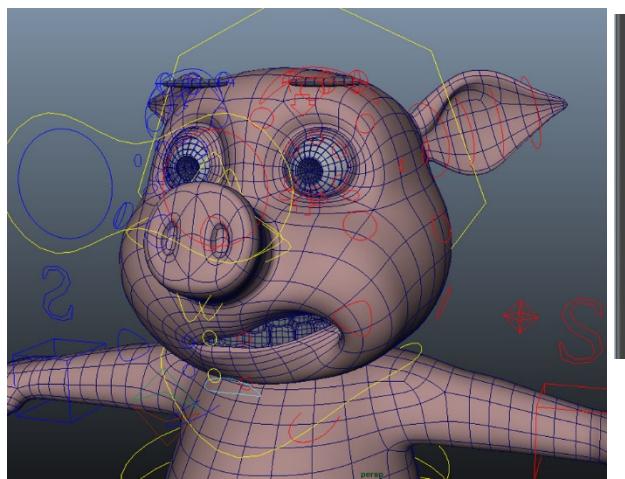
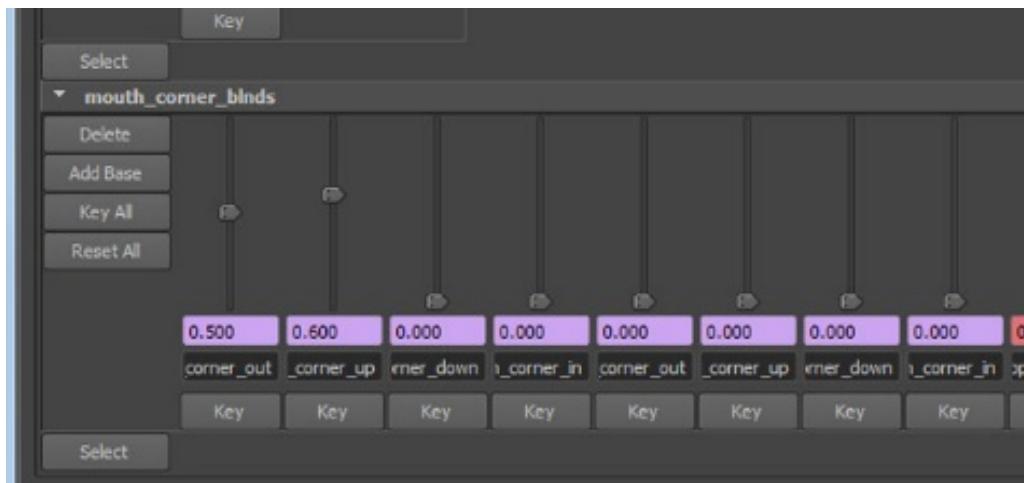
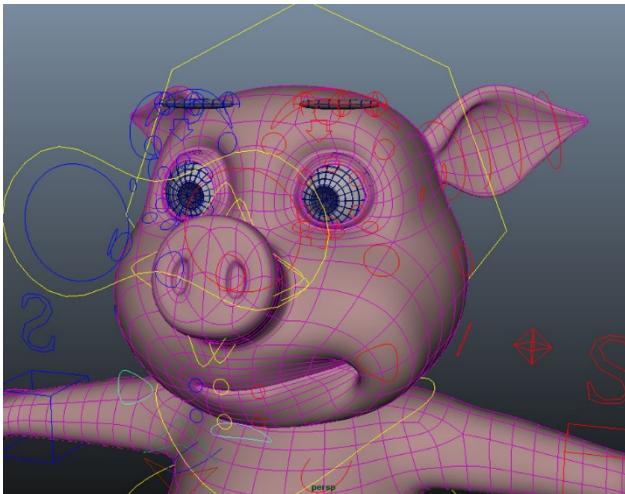


Facial blend shape expressions



Facial blend shape node

Project B Pig Rig Facial rig



Facial blend shape setup result

Project C Bat Rig Character design



Project C Bat Rig



Final render result



Texture & Fur by Yayu Chen

Project C Bat Rig Functions

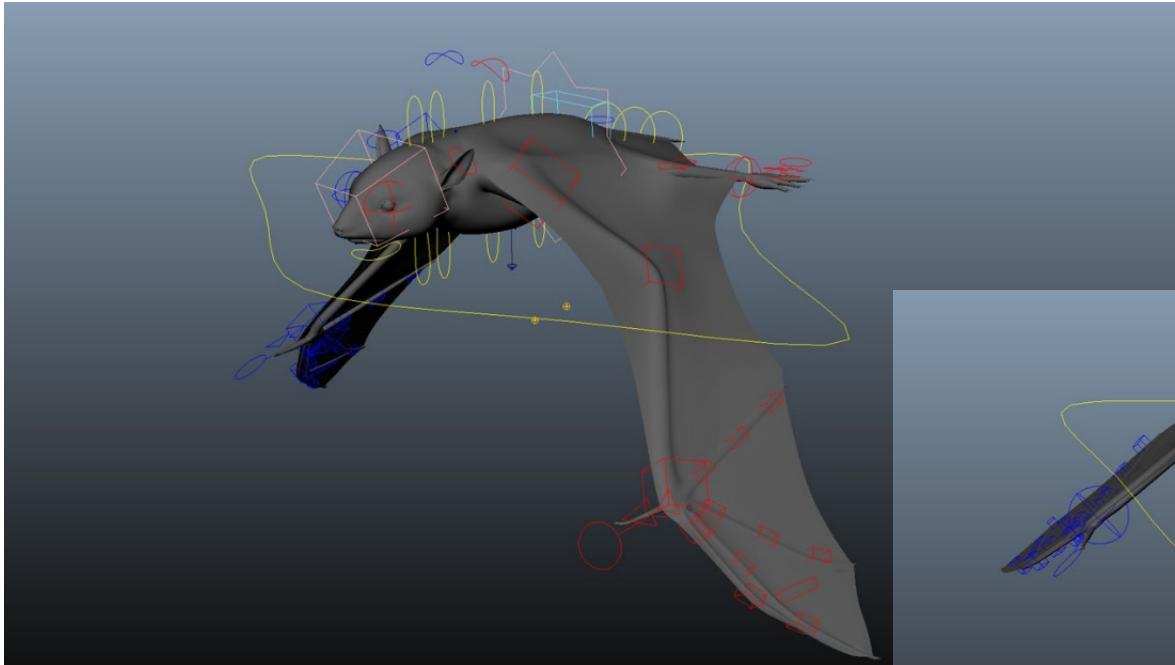
features

- Joint based facial rig
- FK spine
- IK/FK switch for wings
- Cloth simulation for wings

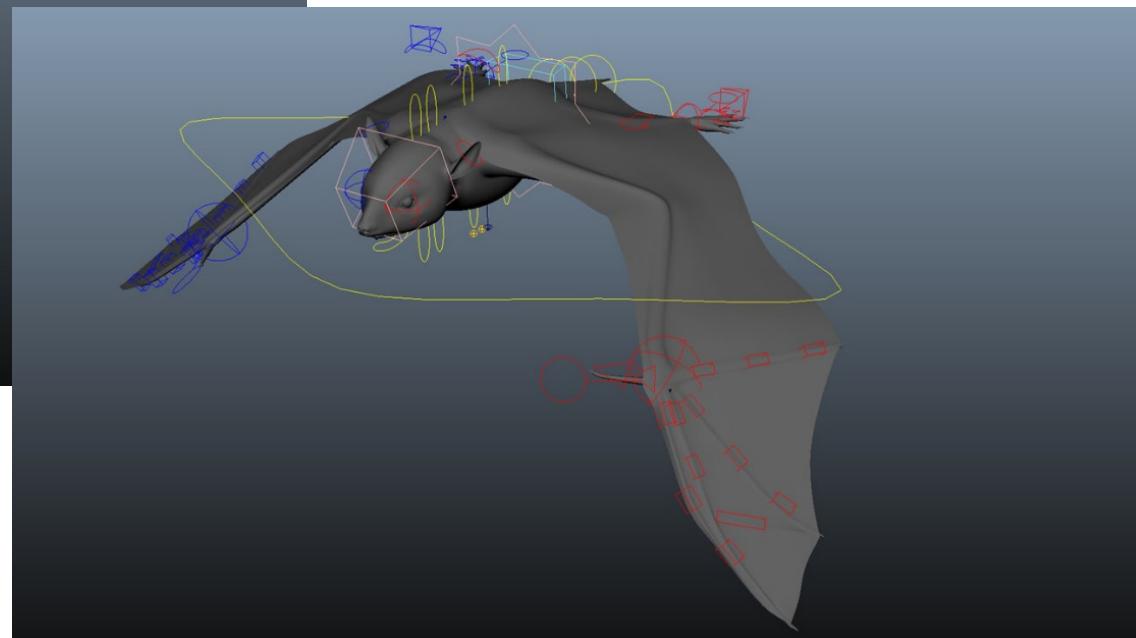


Texture & Fur by Yayu Chen

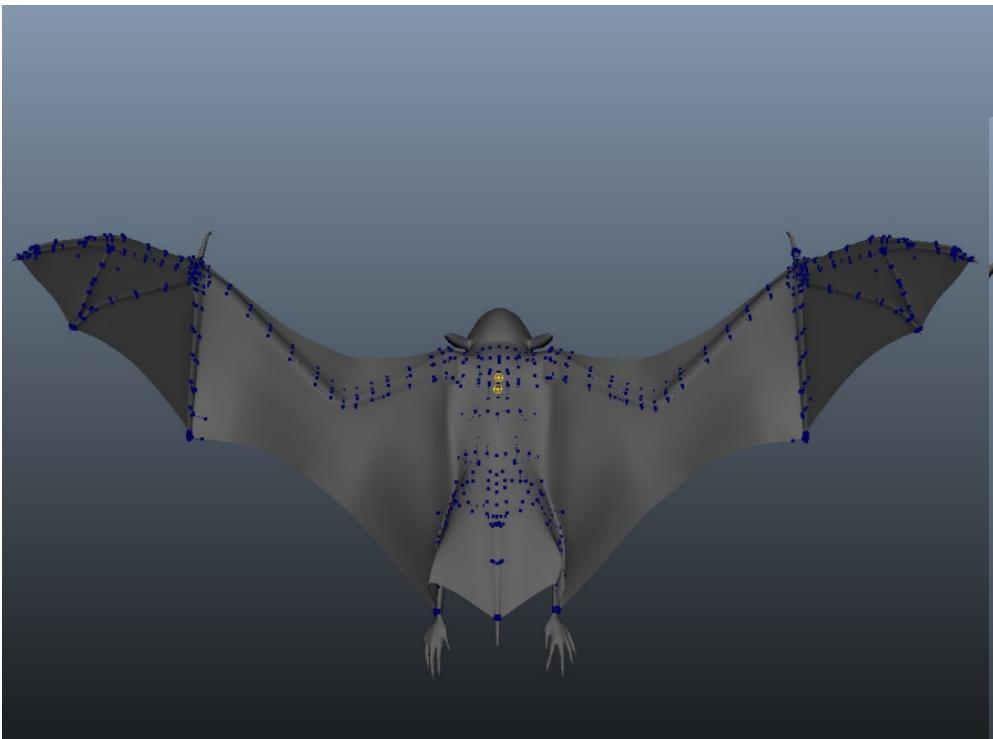
Project C Bat Rig Technique



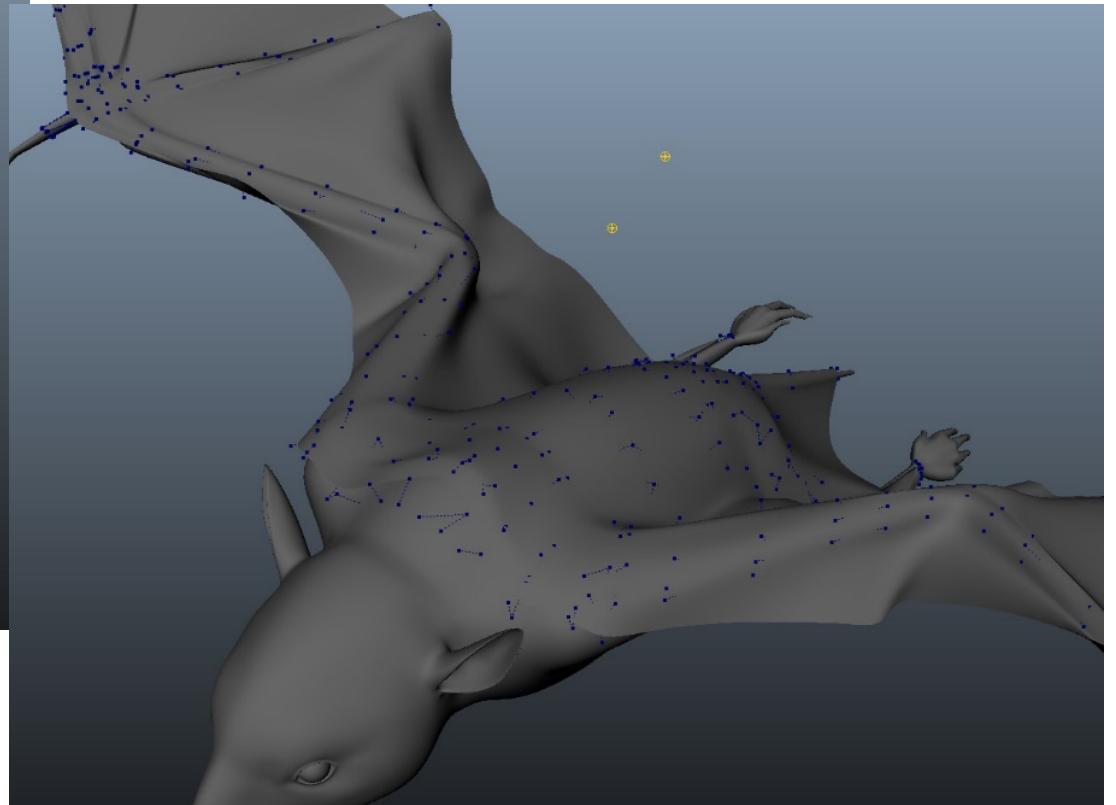
FK/IK Wings



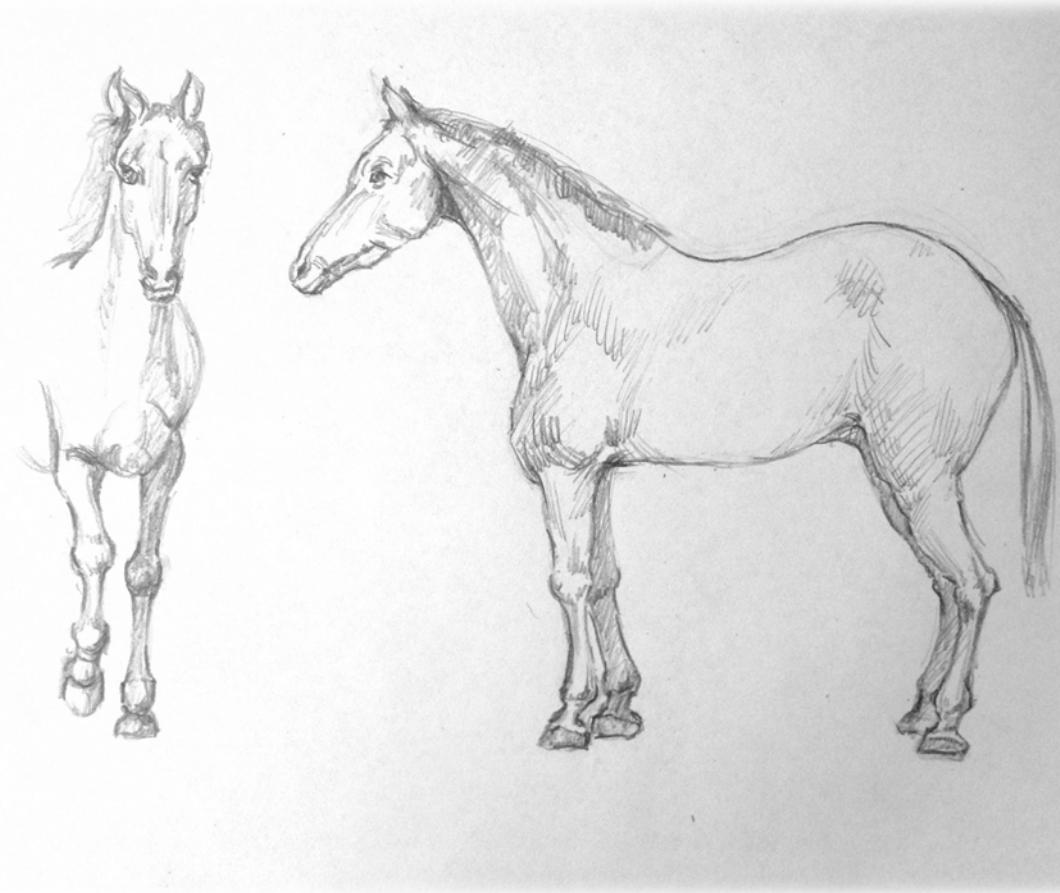
Project C Bat Rig Technique



Cloth simulation for Wings



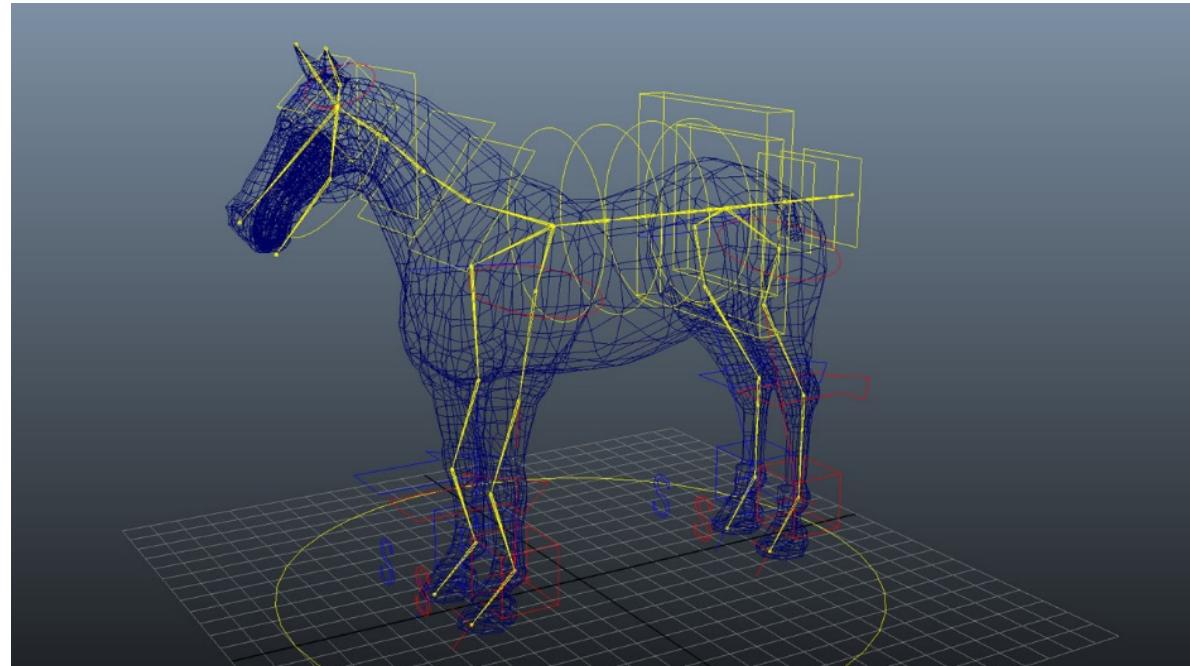
Project D Auto Rig Script for Quadruped Character design



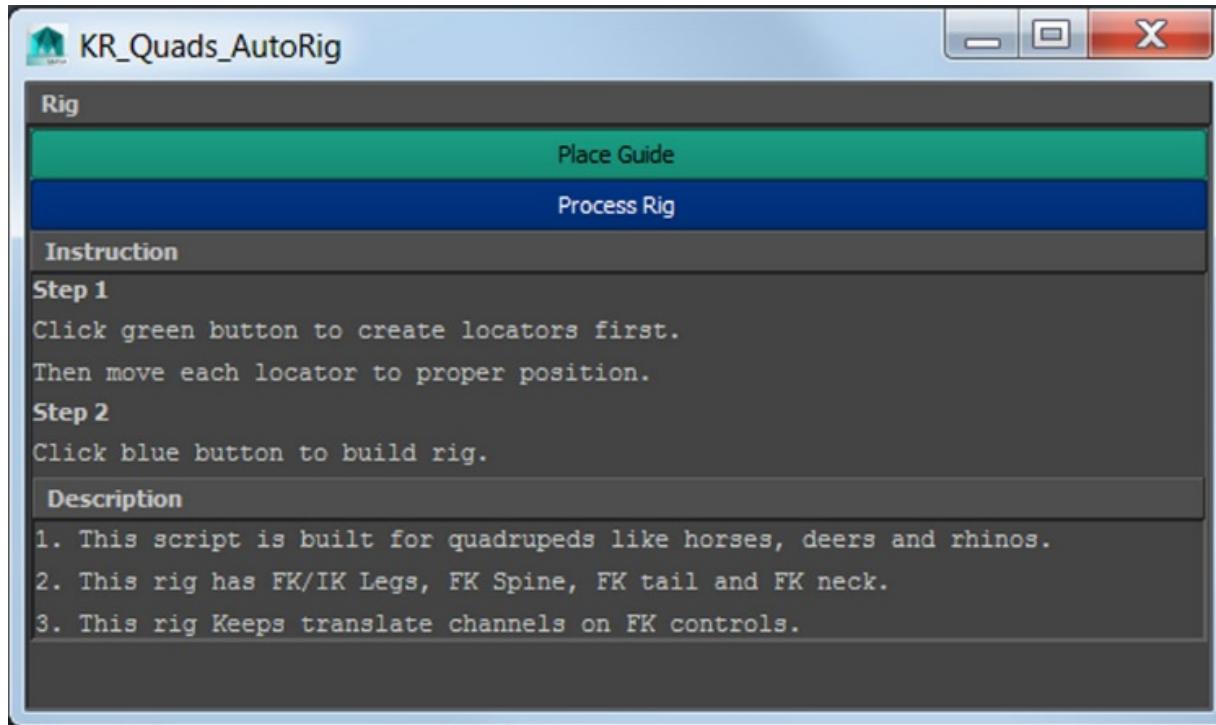
Project D Auto Rig Script for Quadruped Functions

features

- Full body joints set up
- Generate effective controllers
- Orienting and attaching units
- Mirror joints and controllers
- Constraint controllers with joints
- FK/IK Switch for legs
- FK Spine, FK neck and FK tail
(Keep translate attributes)
- Clean outliner

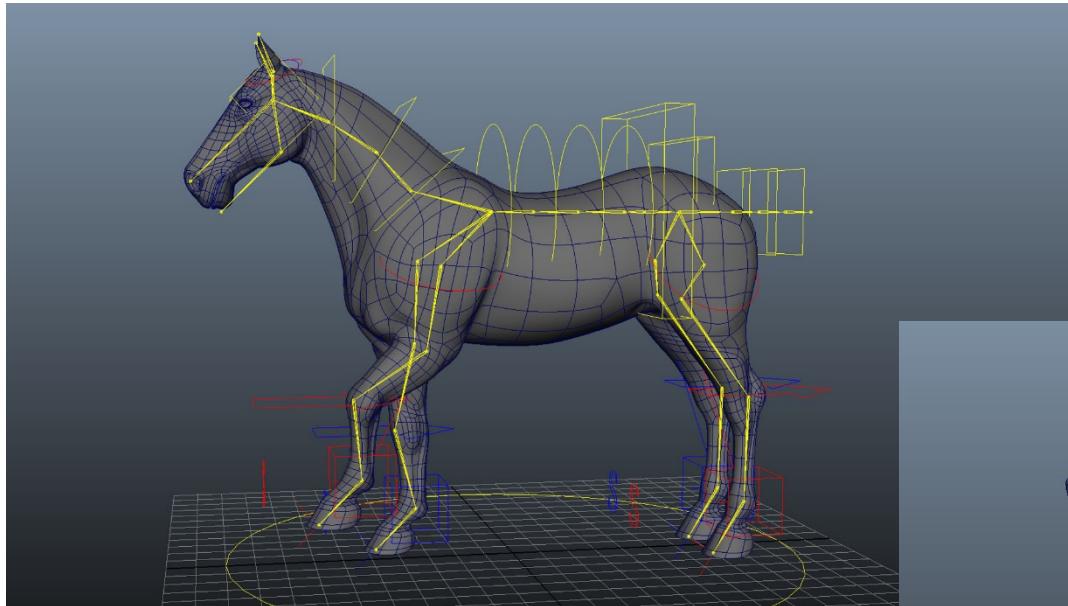


Project D Auto Rig Script for Quadruped GUI

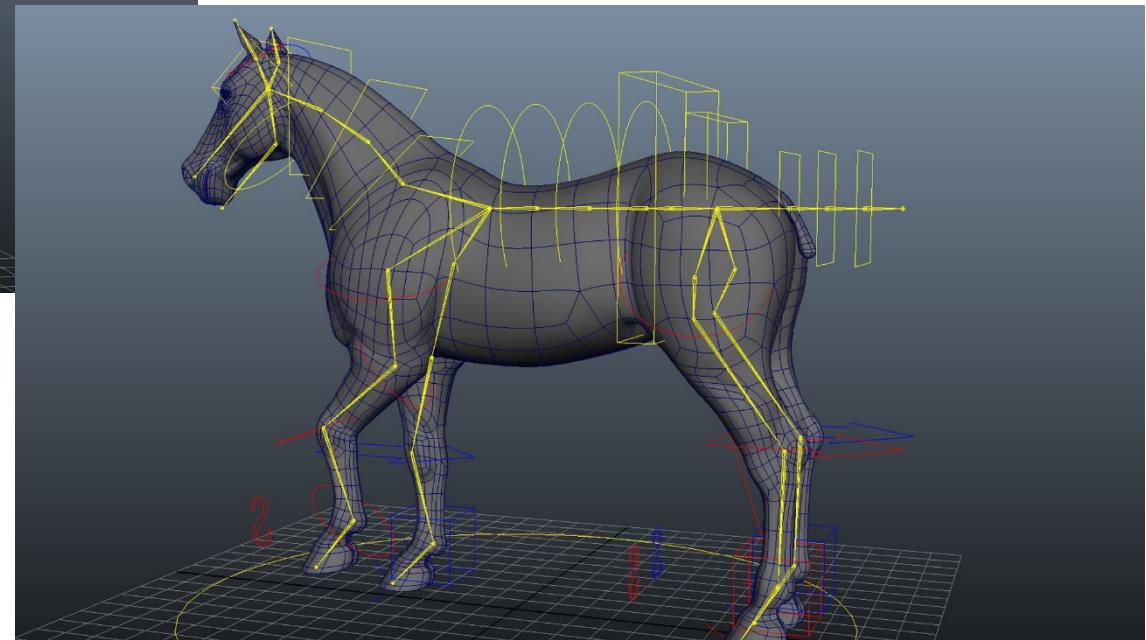


- One button for place guide
- One button for processing rig
- Instruction for how to use this tool
- Description for what should be noticed

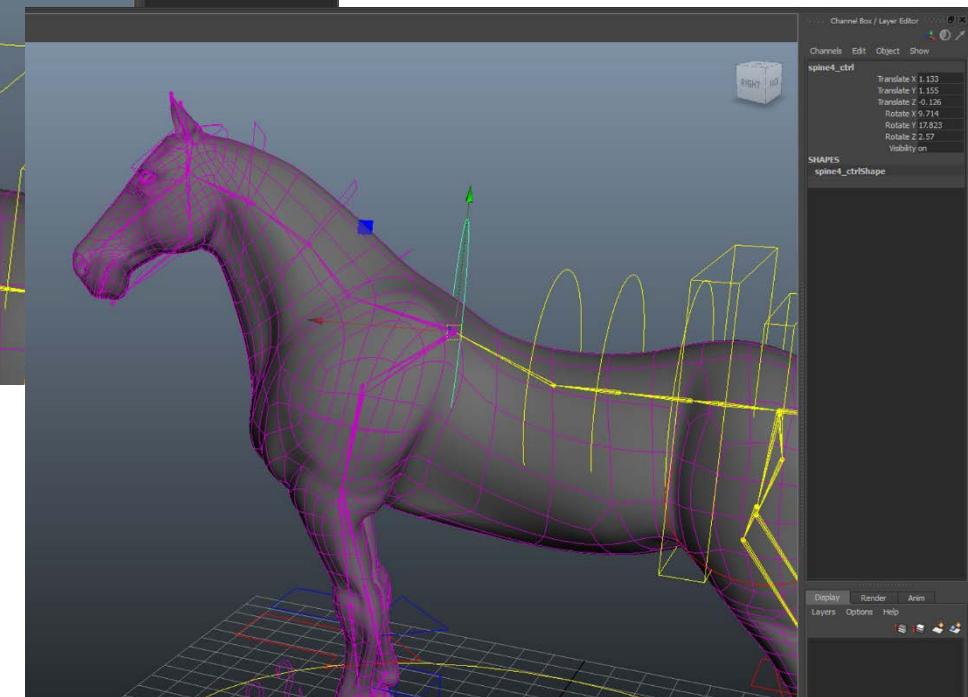
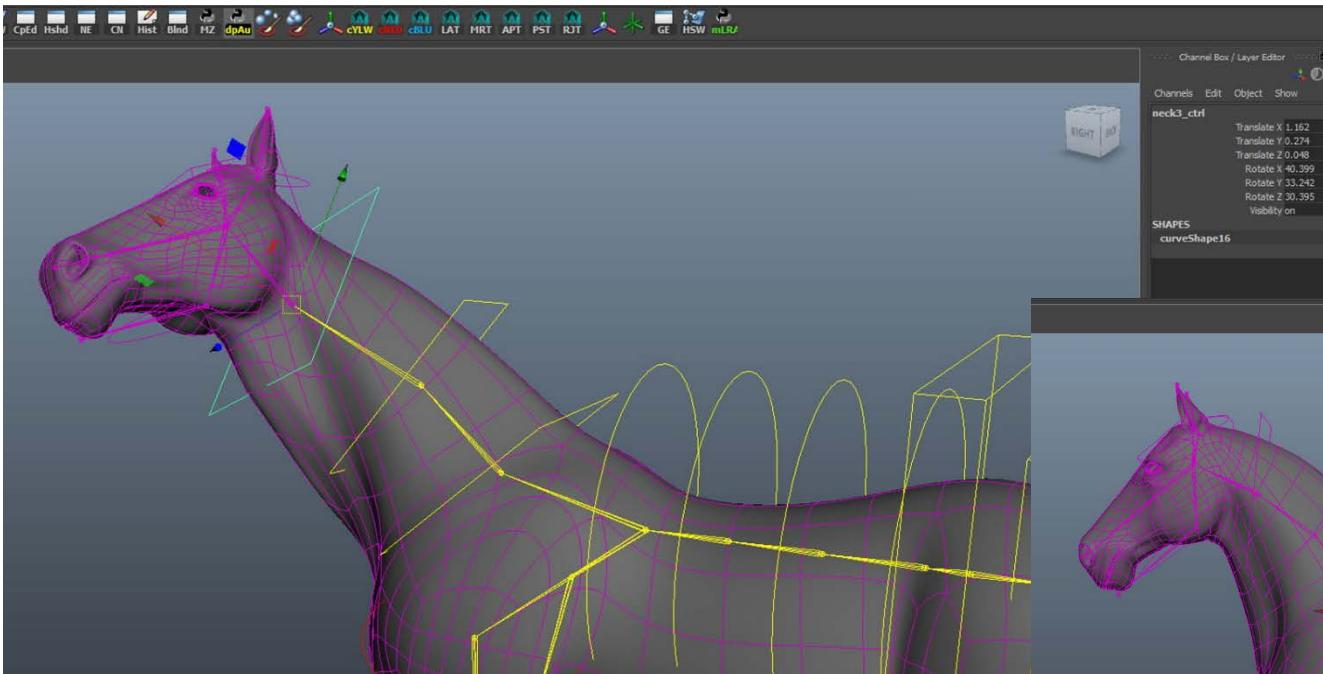
Project D Auto Rig Script for Quadruped Technique



FK/IK Legs



Project D Auto Rig Script for Quadruped Technique



Project D Auto Rig Script for Quadruped Reason

- Learn more about Python
- Necessary for working in this industry
- Go over rigging process by coding

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File Edit Selection Find View Goto Tools Project Preferences Help

```
kr_quad_automig_v22.py
```

1 from maya import OpenMaya
2 import maya.cmds as cmds
3
4
5 def wkl():
6 # Create window
7 cmds.window("kr_Quad_AutoMig", title="KR_Quads_AutoMig", widthHeight=(400, 600), s=False)
8 cmds.frameLayout("label1", labelAlign="top", borderStyle="in")
9 cmds.frameLayout("label2", labelAlign="top", borderStyle="in")
10 cmds.frameLayout("label3", labelAlign="top", borderStyle="in")
11 cmds.frameLayout("label4", labelAlign="top", borderStyle="in")
12 cmds.frameLayout("label5", labelAlign="top", borderStyle="in")
13 cmds.frameLayout("label6", labelAlign="top", borderStyle="in")
14
15 cmds.frameLayout("label7", label="Instruction", labelAlign="top", borderStyle="in")
16 cmds.text("label8", t="Step 1: Font = boldlabelfont", align="left")
17 cmds.text("label9", t="Font = boldlabelfont", align="left")
18 cmds.text("label10", t="Then move each to proper position, Font = fixedheadfont, align="left")
19
20 cmds.text("label11", t="Font = fixedheadfont", align="left")
21 cmds.text("label12", t="Click blue button to build rig", align="left")
22
23 cmds.frameLayout("label13", label="Description", labelAlign="top", borderStyle="in")
24 cmds.text("label14", t="This script is built for quadruds like horses, deer and rhinos.", align="left")
25 cmds.text("label15", t="Font = fixedheadfont, align="left")
26 cmds.text("label16", t="Font = fixedheadfont, align="left")
27 cmds.text("label17", t="Font = fixedheadfont, align="left")
28
29 cmds.text("label18", t="Font = fixedheadfont, align="left")
30
31 cmds.frameLayout("label19", label="Setup", labelAlign="top", borderStyle="in")
32 cmds.select("p1", r=True, noNamespace=True)
33 cmds.setAttr("p1", t=(1, 0, 0), k=True, l=True, n="p1")
34 cmds.setAttr("p1", r=True, noNamespace=True)
35 cmds.select("p2", r=True, noNamespace=True)
36 cmds.setAttr("p2", t=(1, 0, 0), k=True, l=True, n="p2")
37 cmds.setAttr("p2", r=True, noNamespace=True)
38 cmds.select("p3", r=True, noNamespace=True)
39 cmds.setAttr("p3", t=(1, 0, 0), k=True, l=True, n="p3")
40 cmds.setAttr("p3", r=True, noNamespace=True)
41
42 cmds.setAttr("p1", v=1, k=True, l=True, n="p1")
43 cmds.setAttr("p2", v=1, k=True, l=True, n="p2")
44 cmds.setAttr("p3", v=1, k=True, l=True, n="p3")
45
46 def lockSelectedObject(self):
47 # Locks
48 # All objects
49 # All selected
50 # All selected relatives
51 # All selected
52 # All selected
53 # All selected
54 # All selected
55 # All selected
56 # All selected
57 # All selected
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65 def redcontrol(self):
66 # Sel list
67 # Sel list
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70 # Sel list
71 # Sel list
72 # Sel list
73
74 def blueControl(self):
75 # Sel list
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81 def guide(self):
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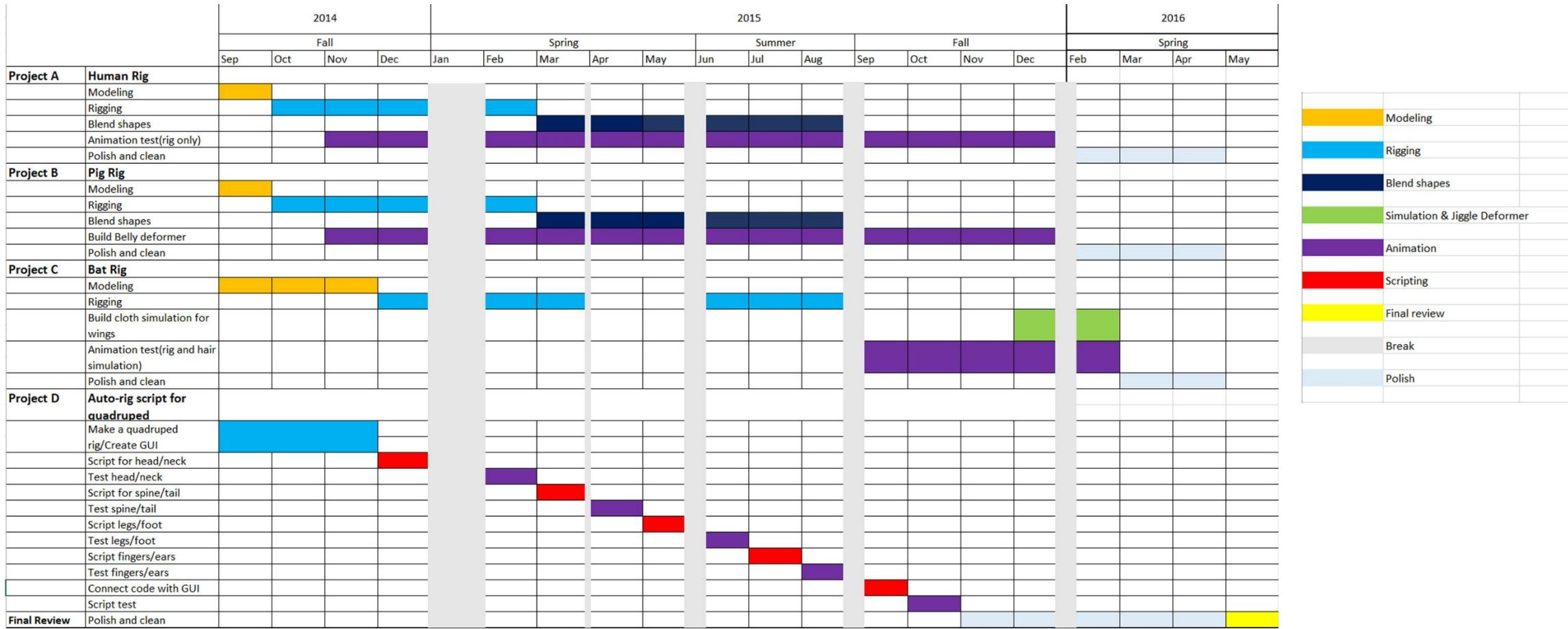
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kr_quad_automig_v22.py
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Code example

Final Timeline



Planned Timeline (Midpoint)

| | | 2014 | | | | 2015 | | | | | | | | | | | |
|------------------|---|------|-----|-----|-----|--------|-----|-----|-----|--------|-----|-----|-----|------|-----|-----|-----|
| | | Fall | | | | Spring | | | | Summer | | | | Fall | | | |
| | | Sep | Oct | Nov | Dec | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
| Project A | Human Rig | | | | | | | | | | | | | | | | |
| | Modeling | ■ | | | | | | | | | | | | | | | |
| | Rigging | | ■ | ■ | ■ | | | | | | | | | | | | |
| | Blend shapes | | | | | | | | | | | | | | | | |
| | Animation test(rig only) | | | | | | | | | ■ | | | | | | | |
| | Build cloth simulation | | | | | | | | | | ■ | | | | | | |
| | Animation test (rig and cloth simulation) | | | | | | | | | | | ■ | | | | | |
| Project B | Pig Rig | | | | | | | | | | | | | | | | |
| | Modeling | ■ | | | | | | | | | | | | | | | |
| | Rigging | | ■ | ■ | ■ | | | | | | | | | | | | |
| | Blend shapes | | | | | | | | | | | | | | | | |
| | Build Jiggle deformer | | | | | | | | | | ■ | | | | | | |
| | Build hair simulation | | | | | | | | | | | ■ | | | | | |
| | Animation test(rig and jiggle deformer) | | | | | | | | | | | | ■ | | | | |
| Project C | Bat Rig | | | | | | | | | | | | | | | | |
| | Modeling | ■ | | | | | | | | | | | | | | | |
| | Rigging | | ■ | ■ | ■ | | | | | | | | | | | | |
| | Build hair simulation for wings | | | | | | | ■ | ■ | | | | | | | | |
| | Animation test(rig and hair simulation) | | | | | | | | | | ■ | | | | | | |
| Project D | Auto-rig script for quadruped | | | | | | | | | | | | | | | | |
| | Make a quadruped rig/Create GUI | | ■ | ■ | ■ | | | | | | | | | | | | |
| | Script for head/neck | | | | | | ■ | | | | | | | | | | |
| | Test head/neck | | | | | | | ■ | | | | | | | | | |
| | Script for spine/tail | | | | | | | | ■ | | | | | | | | |
| | Test spine/tail | | | | | | | | | ■ | | | | | | | |
| | Script legs/foot | | | | | | | | | | ■ | | | | | | |
| | Test legs/foot | | | | | | | | | | | ■ | | | | | |
| | Script fingers/ears | | | | | | | | | | | | ■ | | | | |
| | Test fingers/ears | | | | | | | | | | | | | ■ | | | |
| | Connect code with GUI | | | | | | | | | | | | | | ■ | | |
| | Script test | | | | | | | | | | | | | | | ■ | |
| | Final Review | | | | | | | | | | | | | | | | ■ |



Timeline in detail

Unit: Day (4 hours per day)

| Project A | | Target | Padded |
|-----------|-------------------|--------|--------|
| Modeling | Modeling | 5 | 8 |
| | Layoutng UV | 3 | 6 |
| Rigging | Planning joints | 5 | 7 |
| | Orient joints | 4 | 5 |
| | Reverse foot | 4 | 5 |
| | IK/FK setup | 4 | 6 |
| | Bendy joints | 5 | 10 |
| | Stretch joints | 5 | 10 |
| | Controller setup | 3 | 6 |
| | Facial rig | 5 | 10 |
| | Blendshapes | 12 | 15 |
| | Paint skin weight | 6 | 10 |
| Rig Test | Animation | 10 | 12 |
| | Revise | 5 | 8 |

| Project B | | target | Padded |
|-----------|-------------------|--------|--------|
| Modeling | Modeling | 5 | 8 |
| | Layoutng UV | 3 | 5 |
| Rigging | Planning joints | 5 | 7 |
| | Orient joints | 4 | 5 |
| | Reverse foot | 4 | 5 |
| | IK/FK setup | 4 | 6 |
| | Bendy joints | 5 | 10 |
| | Stretch joints | 5 | 10 |
| | Controller setup | 3 | 6 |
| | Facial rig | 5 | 10 |
| | Blendshapes | 12 | 15 |
| | Paint skin weight | 6 | 10 |
| Test | Animation | 10 | 12 |
| | Revise | 5 | 6 |

Timeline in detail

Unit: Day (4 hours per day)

| Project C | | Target | Padded |
|------------|-------------------|--------|--------|
| Modeling | Modeling | 5 | 3 |
| | Layoutting UV | 3 | 3 |
| Rigging | Planning joints | 5 | 7 |
| | Orient joints | 4 | 5 |
| | IK/FK setup | 4 | 8 |
| | Controller setup | 3 | 6 |
| | Facial rig | 5 | 3 |
| | Paint skin weight | 6 | 10 |
| Simulation | Cloth simulation | 4 | 8 |
| Test | Animation | 10 | 5 |
| | Revise | 5 | 6 |

| Project D | | Target | Padded |
|------------------|-------------------------------------|-------------|--------|
| Build a real Rig | & Creat GUI | 70 | 70 |
| | Quadruped rig GUI | 10 | 10 |
| Scripting | Generating joints for head and neck | 11 | 11 |
| | Generating joints for Spin and tail | 10 | 10 |
| | Generating joints for legs and foot | 12 | 20 |
| | Generating joints for ears | 20 | 10 |
| | Orient Joints | 10 | 20 |
| | Create Controllers | 14 | 15 |
| | Attach controllers and joints | 10 | 20 |
| | Mirror and rename | 5 | 10 |
| | Connect GUI | 10 | 20 |
| | Test | Integration | 8 |
| | Revise | 7 | 10 |

Complete Class

| | | | |
|---------|--|------------|--|
| ANM 636 | MS: Organic Modeling 1 | FA 622 | MS: Anatomy for Artists |
| ANM 652 | MS: Introduction to Rigging | GLA 670 | Profession Practice for Animation & VFX |
| ANM 655 | MS: Scripting | FASCU 632 | MS: Ecorche |
| ANM 670 | MS: Preproduction | ANM 694 | MS: Head Sculpture & Facial Expressions |
| ANM 686 | MS: 3D Character Animation 1 | ANM 801-17 | MS: GROUP DIRECTED STUDY: Rigging |
| ANM 687 | MS: 3D Character Animation 2 | ANM 801-18 | MS: GROUP DIRECTED STUDY: Rigging |
| GLA 606 | Crossing Borders: Art & Culture | ANM 656 | MS: Organic Modeling 2 |
| GLA 602 | The Art & Ideology of The 20th Century | GAM 303 | Creature Rigging and Animation |
| GLA 621 | History & Techniques of Character Animation | GAM 409 | Advanced Rigging |
| ILL 625 | MS: Perspective for Illustration | ANM 499-71 | Advanced Scripting |
| | | GAM 494-01 | Game Studio Experience (Riot Games sponsored) |

Thank You
