

Hybrid Creature Project: Groovy Graphics Assignment

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Figure 1: Student Work Example

ABSTRACT

This groovy graphics assignment is actually a multi-staged assignment going from concept through creation to animated presentation of a hybrid creature which could plausibly exist on Earth. Each stage of the project has its own challenges and learning goals and as such, could be broken out to be standalone assignments in their own rights. Some already have been at both the high school and college level. The entire project covers a range of topics including but not limited to comparative anatomy, animal locomotion, animal habitats, food chains, 2D visualization, 3D modeling for animation, digital sculpting, surfacing, lighting, rendering, and animation.

CCS CONCEPTS

• **Applied computing** → **Fine arts; Media arts; Computer-assisted instruction; Education**; • **Computing methodologies** → **Computer graphics**;

KEYWORDS

Anatomy, education, comparative anatomy, modeling, sculpting, visualization, animation, rigging

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1 OVERVIEW

As educators we struggle with coming up with ways to not just instruct students in specific skills but to help them grasp higher level abstract concepts, develop critical thinking and problem solving skills, and, of course, to keep them motivated throughout the process. The Hybrid Creature Project has successfully addressed those concerns in the Organic Modeling course I developed in 2010. Some of the specific skills have evolved to match changes and advancements in software, hardware and other methodologies of production but the core of the project and outcomes have not. Fantasy creature creation inherently inspires student imaginations while challenging them with both the need to make their creatures plausibly exist in the real world as well as needing to learn and apply new technical skills necessary for executing the assignment.

2 TOPOLOGY

The intent for the project is to create a creature character that is production ready. This means that in addition to aesthetic concerns of shape and form, the surface topology must be properly worked out for proper deformation when rigging and animating. Animation ready topology is a primary concern in the Organic Modeling course for which this Hybrid Creature project is currently the capstone project. Prior to modeling the creature, a topology diagram must be created and presented. This is usually drawn over the model sheet.

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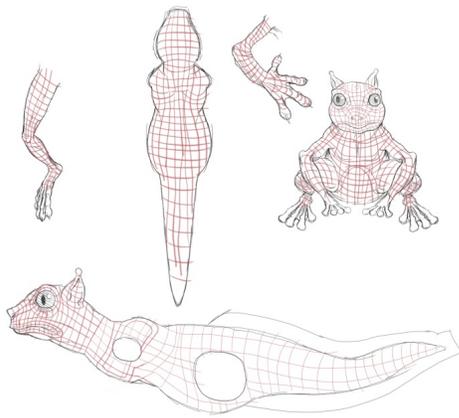


Figure 2: Model sheet plus initial topology

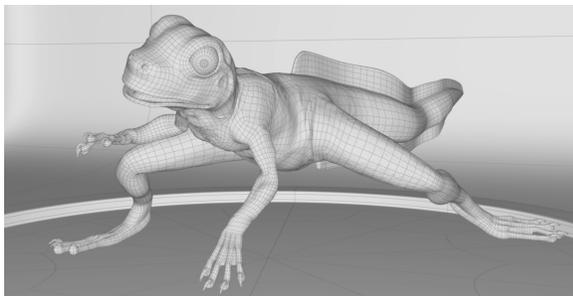


Figure 3: Final topology

Summary	<p>Part I: Elevator pitch explaining what animals will be combined to create a hybrid creature and how the respective features are advantageous.</p> <p>Part II: Three to five minute oral presentation about the hybrid creature addressing predator or prey status, diet, habitat, locomotion and any other relative creature facts. Also included are model sheets, topology drawing(s), what will be addressed through sculpting, and any examples of work already in progress.</p> <p>Part III: Creation of production ready base model.</p> <p>Part IV: Sculptural details added, exported as displacement and normal maps, and applied to base model in Autodesk Maya.</p> <p>Part V: Turntable animation presenting model with sculptural detail applied along with wire-frame views.</p> <p>Bonus: For extra credit students may creatively pose their creatures for Part V.</p> <p>Examples of student work: https://vimeo.com/channels/organicmodeling</p>
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Learning Outcomes	Creature design, concept presentation, organic modeling for production, digital sculpting, exporting and applying displacement and normal maps.
Classification(s)	Modeling, shape modeling, animation, rendering, visualization
Audience	Third term sophomore in 10 week quarter system (sixth term of study)
Dependencies	Prior courses address modeling, surfacing, lighting, rendering, animation, deformers and joint rigging in addition to figure drawing.
Prerequisites	The Organic Modeling course first provides instruction in human anatomy, topology for animation and specific topology for human models. After completing a human model, students receive instruction in comparative anatomy and shown how to adapt and apply human modeling techniques and topology to an animal of their choice which they model.
Strengths	The freedom of designing and then creating their own fantasy creature is what students regularly report as a strength of the course.
Weaknesses	The plausibility requirement for the creature design, solving for the topology, overall research needed and workload.
Variants	Students may sculpt their creature first then retopologize rather than modeling a base mesh then sculpting.
Assessment	<p>Part I: Plausibility of concept</p> <p>Part II: Presentation quality (oral and visuals), accuracy of topology diagram(s).</p> <p>Part III: Topology, aesthetics (shape, form, anatomical details including but not limited to teeth, claws, et al)</p> <p>Part IV: Successful application of maps to base model.</p> <p>Part V: Quality of model presentation (animation, lighting, rendering, inclusion of wire-frame views)</p> <p>Note: Whereas Parts I and II are standalone grades, Parts III through V are all part of the final project.</p>