



Overview of Projects in General

Each project is designed to move your learning experience and skill level forward. Failure to complete or sufficiently explore components of one project will lead to increased difficulty on the succeeding project. Each project is composed of three parts: analysis, interpretation, and demonstration.

Project Description

Investigate and choose a terrestrial quadrupedal mammal that exhibits an appealing or intriguing form and motion. The animal must either exist currently or have an extensive fossil record. Using reference video of the animal in motion as a guide do the following:

- Footfall Pattern Charts (25%)
 - ✓ Locate, reference, and provide movies of two locomotion gaits (walk, trot, or run) of the animal.
 - ✓ Using the reference as a guide, indicate the footfall patterns as two separate labeled charts in a single document using standard charting techniques.
- Procedural Gait Generation (75%)
 - ✓ Create a rendered scene showing simple objects representing the animal's four feet moving over a ground plan in proper sequence and timing for each gait with a transitional period in between.
 - ✓ A single control, which manages gait speed, should be visible in the rendered scene.
 - ✓ Speed should increase from the slower gait to the faster gait then back to the slower gait as smoothly as possible.
 - ✓ The footfall pattern and timing of each gait should match the reference.
 - ✓ The path of the feet through the air and their timing should match the reference.
 - ✓ Demonstrate at least three cycles of each gait before transitioning.
 - ✓ The transition between gaits should match the reference.
 - ✓ Include as separate file a text version of the scripts and/or expression(s) used to control the movement.
 - ✓ Depiction of the form of the animal is not important.
 - ✓ The environment should indicate speed through the use of a gridded ground plane or markers.
 - ✓ The render should include motion blur and contact shadows.

The project will be presented in class both as a real-time demonstration of the animation setup inside of a 3D animation package and as a rendered clip.

Technical Specifications

- Reference movies:
 - ✓ The movie files format should be Quicktime H.264.
 - ✓ Gait 1 reference file name: <LastNameFirstName>_<animal>-<gait>_VIZA_615.mov.
 - ✓ Gait 2 reference file name: <LastNameFirstName>_<animal>-<gait>_VIZA_615.mov.
- Gait charts:
 - ✓ The gait charts should be in pdf format. Single page.
 - ✓ Format of charts should follow styles found here:
<http://www.viz.tamu.edu/research/pbanimation/data.shtml>
- Procedural Gait Generation:
 - ✓ Any 3D animation software may be used.
 - ✓ Rendered images should be in the form of a movie file and playback at either 24 or 30 fps.
 - ✓ The image size should have a resolution no smaller than 720 pixels in its smaller dimension and an aspect ratio of 1.66, 1.85, or 2.35.
 - ✓ The movie file format should be Quicktime H.264.
 - ✓ Contact shadows on a ground plane.
 - ✓ Action should take no longer than 20 seconds.
 - ✓ Front or Side views plus 3/4 –angle view composited together.
 - ✓ Procedural gait file name: <LastNameFirstName>_ProcGait_VIZA_615.mov

Project Goals

- Identify the gaits of animals
- Chart the gaits of an animal in a standardized form
- Design a computer graphics solution that generates the footfall pattern through use of a simple driver.
- Implement a method for transitioning from one gait to another
- Evaluate and critique your own work and the work of others

How Success is Measured

- A successful project will communicate not only the gaits of the animal but also indicate the identity of the animal.
- The form of the animal is not important. The objects representing the feet can be highly abstract or simple spheres.
- The realism of pattern, timing, and motion paths of the feet is of primary importance.
- The visual appeal of the rendered presentation is important –it should be clear and aesthetically motivated.
- The environment should provide a way to visually understand the animal's speed.
- The movement of the single controller and the change in speed of the animal should match.
- The script or expression should be annotated where necessary for clear understanding.
- Simplicity and elegance of the scripted solution is ideal.
- A successful project will be ready for presentation at the beginning of class, with a clear verbal introduction and explanation of methods used. If copyrighted source material is used the source must be cited.
- During the presentation you should be able to explain and named the gaits, and explain the math and programming used to accomplish the procedural representation.

Resources

Gait Analysis:

- <http://vanat.cvm.umn.edu/gaits/>
- <https://mymodernmet.com/animal-gaits-animation-stephen-cunnane/>
- <https://vimeo.com/215637283>