

# CAS 737 Computer Animation Winter 2024

## Assignment 2

### Forward Kinematics - Motion Editing

In the class, we discussed the bvh motion capture file format and different methods for editing existing motions. In this assignment, the bvh parser code is provided and we will experiment with some simple motion editing methods.

#### Code & Data

The following python files are provided for you to have an easy start:

BVH.py - parsing \*.bvh file, read and write animations in bvh file format.

Animation.py - describing motions loaded from bvh file.

Quaternion.py - rotation representation and its related code and conversion to matrix representation as well.

MotionEditing.py - example code for editing, two editing functions are already implemented.

The motion capture files for experiment are:

16\_26.bvh - from CMU Motion Capture Dataset, walking right

111\_37.bvh - from CMU Motion Capture Dataset, right arm waving

To visualize the bvh motions, you can use the online bvh player at

<https://theorangeduck.com/media/uploads/BVHView/bvhview.html>

#### Tasks

The tasks for assignment 2 are to implement the following functions in MotionEditing.py (marked by TODO):

##### 1. Concatenating

Implement the concatenate function, so that it generates a new animation that smoothly connects two animations. Use the blending scheme introduced in class for smoothening.

Use the implemented concatenate function to generate an animation that first does walking then arm waving from the provided 16\_26.bvh and 111\_37.bvh. Save the result animation to the "result\_concatenated.bvh" file.

## 2. Splicing

Implement the splice function. 111\_37.bvh has the right arm waving motion. 16\_26.bvh has the walking motion. The splicing requirement is: keep all the movements in walking except the right arm, splice the right arm waving from 111\_37.bvh. Note that 16\_26.bvh has 269 frames, and 111\_37.bvh has 324 frames. To simplify the splicing, first temporally scale the 111\_37.bvh to 269 frames, the same length as the 16\_26.bvh, then copy the corresponding body part channels to the result animation.

Save the result spliced animation to the “result\_spliced.bvh” file.

## Submission

Submit the following files in a zip through Avenue:

- Source python code implemented in MotionEditing.py
- The synthesized animation results in bvh files, i.e. “result\_concatenated.bvh” and “result\_spliced.bvh”.

Deadline: Feb 28, 2024