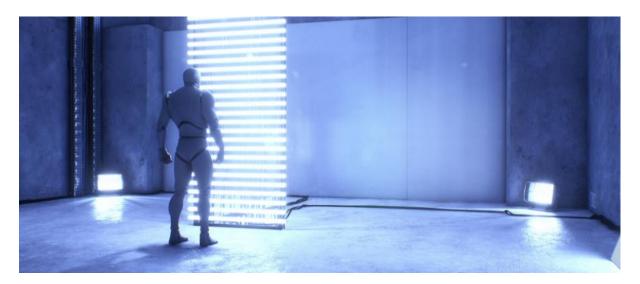# Assignment #4 B: Interactive Music Video with Animated Character

Due Date: demos on the week of the 19th of April, 2021
Coursework %: approximately 55%

The purpose of this assignment is for you to demonstrate the real-time animation concepts and methods you have learned in a real-time music video

1. This assignment is strictly **individual** (no groupwork).

2. You must create an Interactive Music Video using the animation concepts that you have learned. The music must be clearly related to the animation. See the end for specifications.

3. You should use a higher-level graphics engine such as Unity or Unreal Engine 4. Assets such as characters and environments can be imported, but the movie should be constructed, and logic should be implemented by you (e.g., you can import a skinned character model, but not one that has full game logic for navigation, you cannot use full environments with props and characters already in them.) Tutorials can be used for guidance but should not be copied directly. Links to any assets used or tutorials followed must be provided in the final report. Note: You should aim to only use free assets to avoid differences across projects based on cost. If there is an inexpensive asset you want to pay for, please run it by Donal or myself first.

4. The deadline for the assignment is the week of April 19th, 2021. On Monday 19th, you will be given your demonstration time, and you will be individually presenting to Rachel, and Donal, during one of the scheduled demo times (to be confirmed). The presentation will consist of a description of your work along with a demonstration of the resulting program. Each required feature must be demonstrated with a clear explanation of the underlying mechanisms/principles of how you achieved it. The demonstration will last 15 minutes, and will be conducted online.

5. You will also be required to submit via Blackboard on 23rd April:
   - a PDF report documenting your concept design, research, and implementation with screenshots, technical features, citations etc. It should include clear details and links of where the assets came from (character, scene, etc.), which parts were coded by yourself and which out-of-the-box features were used.
   - a youtube link with "CS7GV5" in the title to a demonstration video-recording of your music video (videos can be recorded using a tool such as FRAPS or Nvidia Shadowplay). The demonstration should clearly show all features (the required and advanced features). If it can't be seen on the demo, it can't be graded.

- You may be required to submit the full Unity/UE4 project, if requested.
- A mandatory declaration that the work on both the programming and written assignments are entirely your own and you have not collaborated with anyone.

6. Do not wait until the last minute to start this final assignment. This assignment is the most **difficult** of all the assignments of this course, and will require some time to achieve. Be sure to attend labs and ask the demonstrators for help.

7. Be aware that demonstrating a program that was not created by you or not crediting out-of-the-box features and plugins is considered **cheating** and will be reported as such. The demonstrator will check if you understand the implementation of all the features of the music video.

Requirements and Examination (To be confirmed)

The required components are:

- **Must have** 3-dimensional objects and views
- **Must be** set to a music track of your choice, and the animation and music should be clearly related (using for example animation timing, staging, related visualizations, lipsync to the lyrics, etc).
- **Must be** 30 seconds or longer
- **Must have** a non-linear animated camera path
- **Must have** one reasonably realistically moving articulated animated character, as part of the story-line and visible during the camera path
  a. There must be multiple joints and children (e.g., arm links and fingers)
  b. The articulated character will be assessed to ensure it has a correct hierarchy and can move correctly according to its structure.
  c. It can use forward or inverse kinematics
  d. It does not have to be organic/human (i.e., can be a robot or object come to life)
- **Must have** an interactive element (e.g., character reacts to user throwing a ball, etc.)
- **Must clearly demonstrate** the following principles of animation in the context of the music video. Note: There should be 5 separate examples visible, and they should be part of the story-line and visible during the camera path.
  a. Squash and Stretch
  b. Ease in, Ease out
  c. Arcs
  d. Anticipation
  e. Exaggeration

The required components are worth approximately 25% of the assignment mark.

Additional Features:

The final 65% (approx) will be given for research and execution of additional animation features

- These can include some of the following, or indeed others that you think of:

1. Motion Capture
2. Motion State Machines
3. Motion Editing – blending, transplanting, etc.
4. Facial animation using morph targets

5. Automatic lip-sync from text or audio
6. Stylized motion
7. Crowd Simulation
8. Gesture or personality modelling for the character
9. Complex/scripted camera motion
10. Interesting character behaviours/AI
11. Particularly imaginative narrative
12. Cloth Simulation
13. Advanced Particle systems
14. Physically-based animation
15. ??? your own imagination is the only limit

Note: The [approximate] marking scheme provided shows the maximum marks that can be obtained for each section if completed perfectly. Merely attempting a section does not imply the full score.

Some examples of top projects from the last years:

https://www.youtube.com/watch?v=FEHQAm7GVdM

https://www.youtube.com/watch?v=Wo0KYOZ13z0&feature=youtu.be

https://www.youtube.com/watch?v=vZGA1X72GYc&t=

https://www.youtube.com/watch?v=vUYDgKJfKmg&feature=youtu.be

https://www.youtube.com/watch?v=D5srmXN8GTs

https://www.youtube.com/watch?v=JNbnToPuskg&feature=youtu.be