MANCHESTER 1824
The University of Manchester

**COMP37111: Advanced Computer Graphics**

# Workshop 4 : Physics-based Animation

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Welcome back!

In this week's workshop you will again split into small groups and reckon the following questions and we will re-gather to discuss our findings and answer some questions in the interactive tool called Mentimeter. We can again safely assume you have already watched the videos for week 4 and we will review on basics of principles in animation as well as physics-based animation.

1. Imagine you were asked to make an animation of your character dancing at the beach! Please describe the steps including but not limited to: modelling, texturing, rigging, skinning, keyframing, tweening, motion capture, ...
2. Which statement is true about rigging?
   - Inverse kinematics is to find the position of the end effector *False, find argument*
   - Inverse kinematics is to find the motion to reach a desired position *True*
   - A pre-rigged skeleton cannot be re-used for another character *False, if character are similar , abs yes*
   - The vertices of the mesh at the joints are connected to only one bone. *False*
3. Why is motion capture useful? *efficiency, realism, versatility(传统方法太多关键帧，脸部抽搐来回抖动不好处理), resuablity*
4. What is the particle system? What are the attributes of particle systems? Discuss the steps for making such a waterfall. *initial point, time period, gravity , 也可以只考虑newtonian mechanics*
5. A particle is traveling along a path in a vector field where the force F is applied in a circle shape. Which technique is inaccurate to solve the ODE? *Euler, Langrangian, Newtonian, Trapezoida*
6. Back to your designed character by the beach, how can you add the hair blowing in wind? Use string-mass force and describe your system. *make hair as line of particles, each two neighbour particles need have constant distance*
7. What is the name of the force that opposes motion and defined as f = -dv for each particle i? (Hint: best to give a glue or honey look) *dampening force*