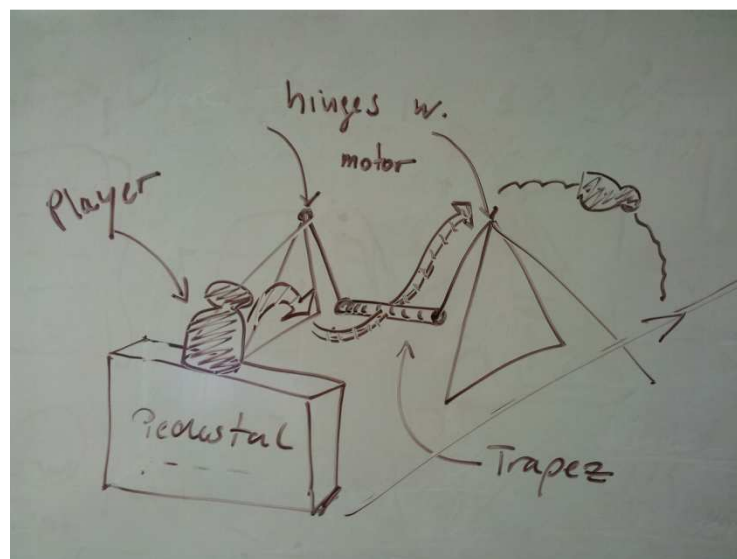


## Assignment 5: Circus Swing

This assignment will combine a lot of topics we have talked about in the last 2 classes: it is a full game, that needs some hierarchy of state machines, it includes physics, and modeling with Sketchup.

Your task: create a physical environment that contains, among other things, a Circus-Swing (Trapeze). The player controls a figure, that is placed on a high pedestal, which it can jump from --- to hopefully reach the trapeze. The player then swings to the other side, lets go of the handle, hence will fly and land at some distance. A score is given for that distance. See this game as a poor version of a Spiderman game --- (i.e. "Flappy Spiderman").

Here is a little sketch that should convey the idea, the lab will also introduce more details.



### Requirements:

- The game must have a start screen, the main game, and a high score table as end screen
- These high level states must be modeled as JMonkey AppStates
- All movement of the trapeze, and the player, must be controlled by the JBullet physics engine.
- The environment must be modeled using Sketchup models, imported to JMonkey. Hence the final game will not create the environment at runtime, but just load a pre-stored scenery.
- Multiple switchable camera views must be incorporated: total view (like in sketch), first person view (behind the figure, direction trapez)

### Some hints:

- Model the trapez such that the handle-bar is a cylinder, attached to stiff rods, not ropes (if you want to introduce ropes, you are on your own. It generates a whole different can of problems)

- The hinges the trapez is connected to the environment should be motorized, such that the trapez can be rotated to a certain position. Then the motor should be detached, such that the trapez starts to swing.
- Be creative with modeling the environment, make it a circus, or a city, or a canyon... you decide.
- Making the figure jump and fly is all controlled by the physics engine. However, when the figure attaches to the handle (that is: collision between figure and handle! Please look up how to register a callback method that reacts to physics collisions. It's simple), then the handle and figure become one rigid entity. How would you model that phase?
- Naturally, since the JBullet engine is involved, all movement of trapeze and player comes from a control, here: a RigidBodyControl.

### Some details about the suggested flow of the game:

- key "s" starts to rotate (lift) the trapez, pressing "s" again, detaches the motor, the trapez swings. This means, the player determines the amount of swinginess
- key "space" collects jumping power of the actual playing figure. Releasing "space" makes the figure jump. pressing space again makes the figure detach from the handle, if it reached it and got successfully attached, to fly and score.

If you want to, you can add ragdoll physics. Have a look at them!

### How to start:

- Create state machines for all entities
- create all physics etc, with a mock environment
- create the real environment, import it into JMonkey
- adjust the physics parameters for playability
- make it beautiful and nice. Add sounds!

Think how you can split the work into a group project. Max. 3 people can be involved. A detailed description of each member's contribution must be given in uploaded comments to the TA.