Project B: Physics-based Tower Crane

2021/05/13

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Due Date

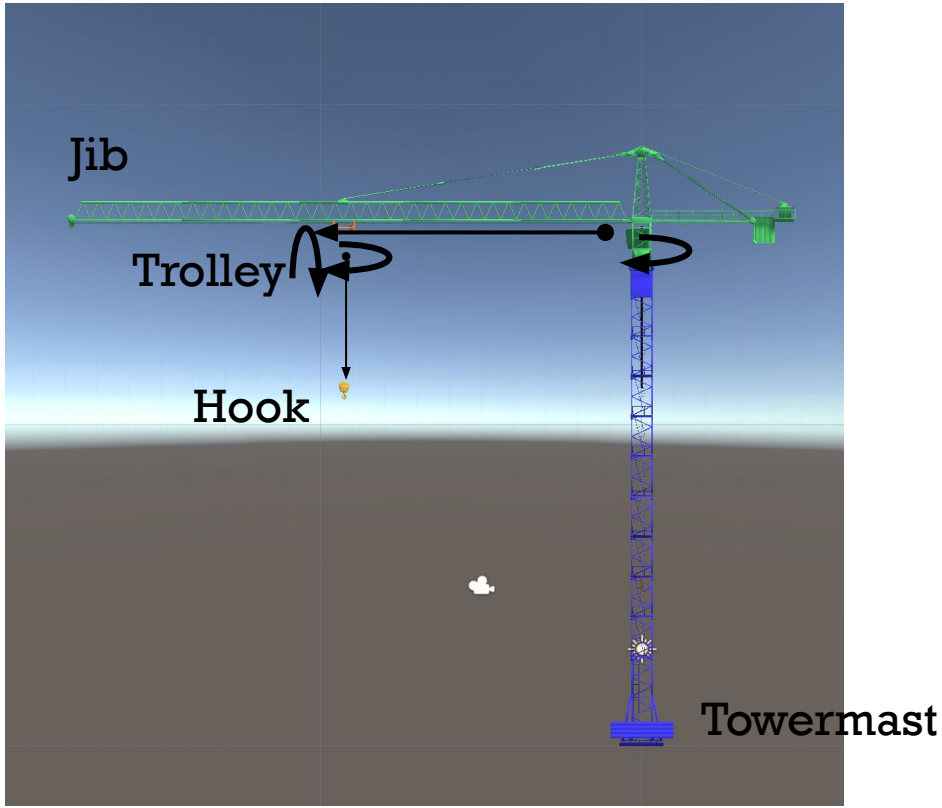
Demo: May 13, 2021 9:10am

Submission: May 20, 2021 9:10am

Project Description

In this project, you will develop a **physics-based tower crane simulator**. You also need to develop the functions to enable users to control the tower crane, so users are allowed to operate the crane to perform an erection task (i.e. to lift an object from a certain position to another). To be more specific, the following five parts will be included during grading.

Project Description



Grading

- **3D Model:** You have to visualize a tower crane and lifting objects. A tower crane model will be provided in FBX format. You are free to find a better model online. (15%)
- **Physics Model:** You have to build up a physics model of the standard tower crane, includes tower mast, operator's cab, jib, trolley, and hook. (20%)
- **Operation Control:** You need to develop the functions for operating the tower crane to perform an erection task by an input device, such as keyboard, mouse or gamepad. (15%)
- **Lifting Task:** You need to develop the functions to allow users perform listing task by dynamically attaching objects and release it to its destination. (25%)

Grading

- **Written Report**: In the written report, you have to briefly explain the major functions you have developed and list the snapshots of them (at least one for each function). If you would like to obtain extra credits, please also list the additional works you have done. Finally, make a list to explain the work division of your team. (25%)
- **Extra Credits**: The following works might obtain up to **20%** extra credits.
  - Fancy scenes rendering – ground, sky, environment etc.
  - Collision notification – reactions of collision detection
  - Different listing task and performance evaluation.
  - or Others.

Demo and Submission

- The program will be demoed in the class of demo day. Each group has to submit a written report, executable file, and source codes (please zip the source codes of whole project) before the due date.
- Late submissions need be approved by the instructor, but the grade may be subtracted 10% for each additional day.

Questions?