CO327 Deterministic OR Models (2021-Spring)

About Project

TL;DR: A pre-recorded video presentation + a small report, on a topic of "an application of optimization".

Instructor: Andersen Ang

Combinatorics and Optimization, U.Waterloo, Canada

ms**x**ang@uwaterloo.ca, where $\mathbf{x} = \lfloor \pi \rfloor$

Homepage: angms.science

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Grading

- According to the course grade formula in the lecture slide 0, the project counts for 20% of your final course grade.
- For this 20 points:
  - 10 points for the small report.
  - 10 points from the video presentation.
- How the report and the presentation will be graded: same way as the scribe notes. Refer to the lecture slide 0 or the slide about scribing.

About the report

- Small report: about 4 pages (double side), at max 10 pages. Remember this is not a thesis!
- Introduce what is the application, some background information, the motivation, the mathematical model.
- Briefly describe what is the optimization model (LP? IP? QP? or other program not covered in class?).
- Briefly describe how people solve such an optimization model. Optional: demonstrate on a simplified toy problem.
- (Important) Learn how to *select information*. Know what is important and what is secondary. Elaborate on the key concept that you think is difficult to understand for laymen. Skip technical details that is not important. A report that is "too clumsy" will have low score.
- There is no strict format on the report, but make it formal!

About the video

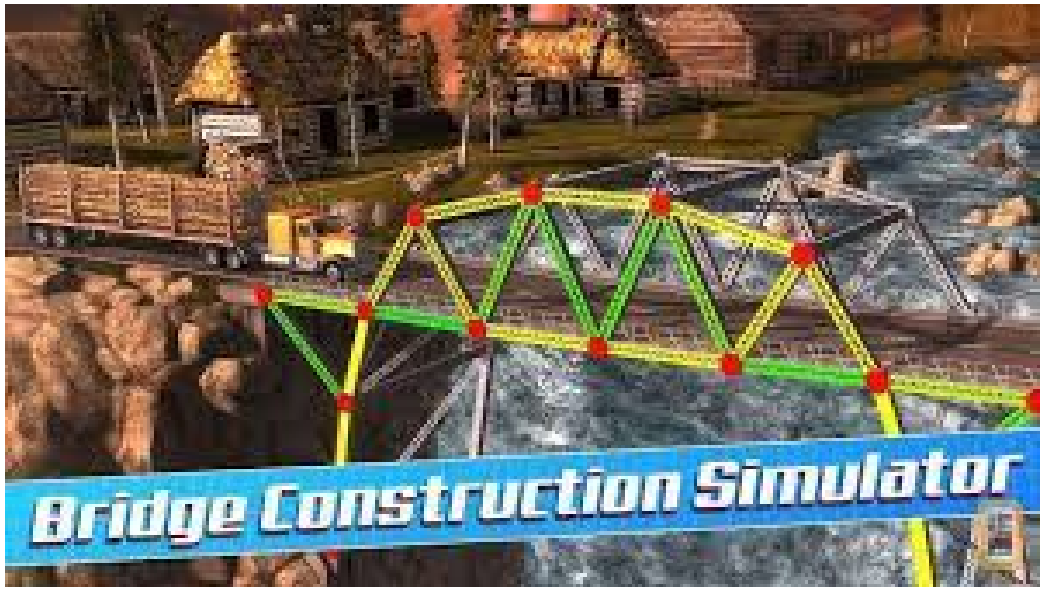
- Short pre-recorded video.
- Duration range: 0 to 12 minutes.
- Slide presentation. You can use what ever tools to create your slide.
- Make a consistent story of the whole study.
- (Important) Learn how to *select information*. Only present the key points of the study, you do not need to copy-and-paste everything on your report to the presentation. Details should be left in the report.
- If your video is no different than the report (i.e., you are just simply repeating the content of your report in the video, without proper trimming of the content), you will get a low score.
- There is no strict format on the presentation, but make it interesting!

Topic

- You can choose any topic you like.
- You can have the same topic as your classmate. No penalty on repeated topic.
  (But you can get bonus points if your topic is novel.)
- Some examples:
  - Airlines / passenger transportation services use optimization to determine schedules.
  - Cargo transportation industry uses optimization to determine how to transport goods as quickly and inexpensively as possible.
  - Finance: portfolio optimization

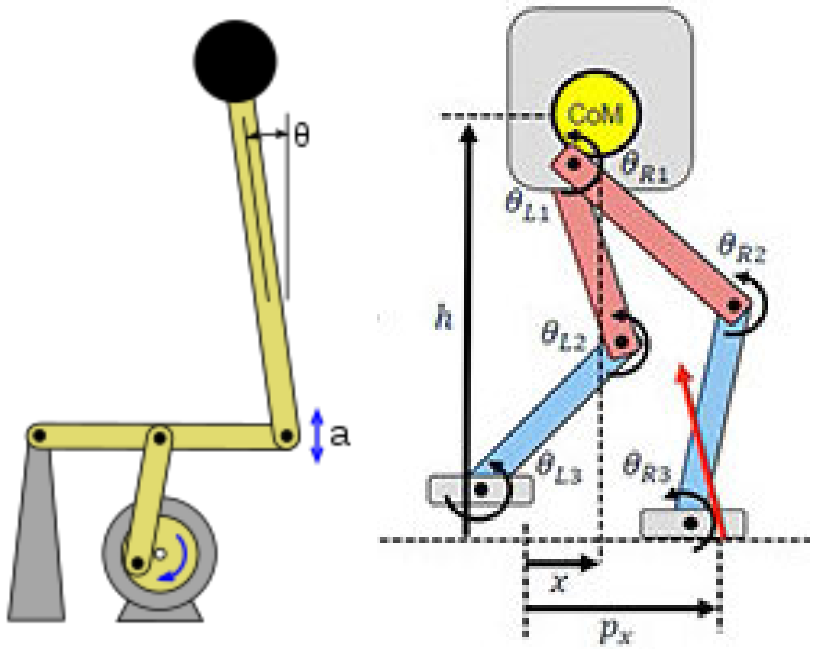
  Or see Tutorial 1 for more list of topics.

Example topic: truss design in structural engineering



- Maximum weight design, Minimum design
- You may need some civil engineering background for this.

Example topic: Trajectory optimization



- Trajectory optimization of a moving object: inverted pendulum, biped robot
- You may need some mechanics background for this.

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