

Modelling project

due August 10

The focus of this assignment is linearizing 2D nonlinear systems. There are three choices:

1. The MRW model (Mankiw, Romer and Weil) which is the Solow model augmented with the human capital.
2. The SIR model used in modelling epidemics.
3. The use of Hamiltonian equations in modelling mechanical systems and in our case spring systems.

Group work This assignment can be done in groups of size 2-3. If you want me to find you partners, email me and I will group people randomly. I highly encourage you to work in groups because it will make marking a lot easier for us. If there is some serious reason that you don't want to work with others please let me know.

Format of work The assignment will be submitted on quercus so that we can use Speed-Grader. If you do things on paper, then you will have to scan them. Alternatively, I highly encourage you to pick up some typesetting language. Today's standard in science and engineering is Tex. In the beginning, I learned the mathematical Tex code via the following online Tex compiler:

<https://www.codecogs.com/latex/eqneditor.php>.

For writing assignments, you can either download a Tex document compiler or use an online document compiler; my favourite one is:

<https://www.sharelatex.com>.

If you finish the project sooner, simply upload the pdf on Quercus with the names and utoid of each group member. Here is a template because some students had problems with getting started with Latex, I created an online file containing a template for the assignment:

<https://www.sharelatex.com/read/ghtvpkrwmfyt>

open a new file and when you are done, click on download pdf.

Bonus Software component I will provide code in Matlab at the end of the extended notes. Matlab is offered for free to UofT students until **June 30th 2018**:

<http://sites.utoronto.ca/ic/software/detail/matlabStudent.html>

We already downloaded Matlab with some students and it contains the ODE solver packages.