SYST003 - LINEAR CONTROL SYSTEMS
HOMEWORK II – Open Loop System

Instructions

- ✓ Maximum 4 pages
- ✓ Be consistent !
- ✓ One report by group
- ✓ Deadline: 14th October 2019 at 23:59
- ✓ Submission online: https://submit.montefiore.ulg.ac.be

Statement

1. Detailed schematic of the open loop system
   Accurate schema of your uncontrolled system with coherent labels
   (see examples slides 22, 27 and 34 on Project session 1)

2. Constraints, assumptions, limitations
   Example of the camera stabilizer: maximal angle, assumptions for linearization...

3. State-space representation
   u: inputs (controllable or not)
   y: outputs
   x: states
   output law: $y=g(x,u)$
   input law: $dx/dt = f(x,u)$
   Is the system linear?
   Yes → matrices ABCD
   No → Linearization (justify your procedure) → matrices ABCD

   Check Syst0002_Fascicule.pdf sent by mail for reminder about systems, modeling, state-space representation and linearization procedure

4. System simulations without controller
   List the numerical values you are using (must be physical and feasible !)
   Example of the camera stabilizer: Inertia, Applied torque, perturbation angle, ...

5. State-space representation analysis (computations and result interpretations)
   (a) Stability
   (b) Observability
   (c) Controllability