Travail de Noël sur la commande des robots mobiles, 2A Rob -Helicopter

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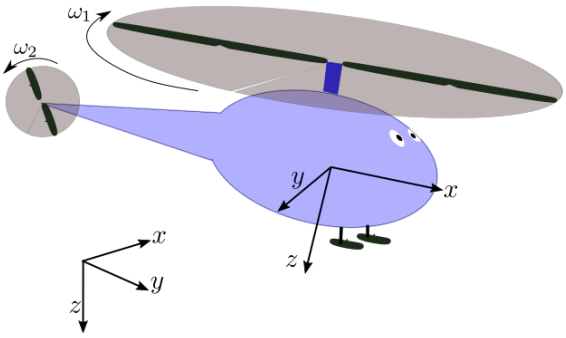
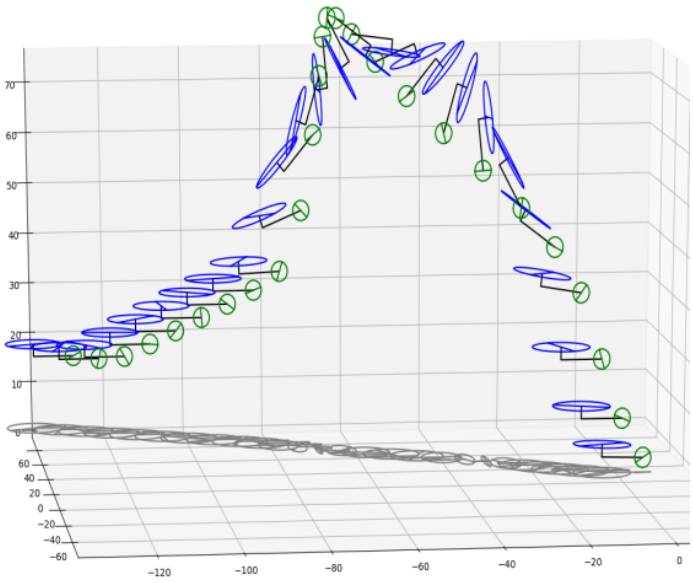
Consider the helicopter robot described by the figure. It has a main rotor on top and a small rotor on the back. In order to control the helicopter, one can tilt the angle of each blade on both rotors. The main rotor is used to move the helicopter up and down, and to make the helicopter tilt forward, backward, left, or right. By tilting a blade to increase the blade's angle of attack, the pilot can increase the force of lift that is pushing up on that blade.



1) Find a state space model for the robot. You can use the Python program for that.

2) Propose a controller for the system, so that the helicopter performs a looping, as illustrated by the figure.



Helicopter performing a looping

You should send a pdf for the equations and video link so that I can check the result.

La note rentrera en compte dans la note globale du contrôle continu.