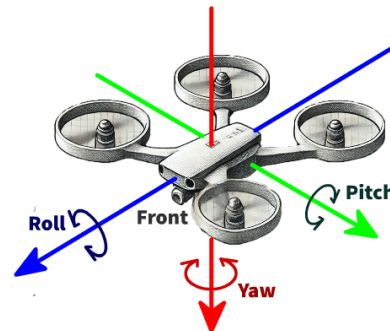# Introduction

For this year, we will grab inspiration from a very trendy topic: drones or UAVs. One interesting application is pick-up and delivery drones that transport packages within the city. This scenario presents interesting features and challenges for a game you will develop in the next 7 weeks. In this game, your skillful pilot will conduct their drone through city obstacles and air-traffic using manual controls.

Typical drone controllers use a left stick to control throttle (up/down) and yaw (rotate left/right), and a right stick to control pitch (forward/backward movement) and roll (sideways movement). These four primary movements—throttle, yaw, pitch, and roll—enable the drone to move and rotate in three dimensions, allowing for complex flight maneuvers. You will use keys on your keyboard to control motion.

Delivery drone   *Basic drone movements*

Work to do

The main goal of AVT laboratory work this year is to recreate the pick-up and delivery drone activity using **C++** and **OpenGL version 3.3**. The idea is to model both the drone and the landscape in 3D, in such a way that an interactive animation can be produced. Then, you have to provide an interface to drive the drone to the pick-up location and the delivery location fast and safely. You also need to create the

environment. The city is a challenging environment full of obstacles (buildings, trees, hills, etc.) and air traffic (other drones, birds and aircraft).

The laboratory work corresponding to the DroneGL project is divided into 12 lab classes where each group will perform the resolution of several exercises and 2 assignments. <u>Each assignment will be evaluated according to a calendar provided in the Presentation class and corresponds to a certain percentage of the final grade</u>. In each of these assessments there are specific objectives and tasks so they can explore the various components of the AVT program.

The rest of this document refers to the tasks for Exercise 2 to be developed in the lab classes of week 2 (September 12 and 17).