Working of Drone

In a quadcopter, the four motors are placed at the edges of the arms of the frame. The direction of rotation of each motor is such that the torque generated by each of the motors cancels out. The adjacent motors rotate in the reverse direction while the opposing motors rotate in the same direction. In order for the quadcopter to hover in place, it is necessary to ensure that all the motors rotate at the same RPM which must be sufficient enough to generate a 'lift' balancing its own weight and the torque due to all four motors must be cancelled out so that the quadcopter don't yaw in a certain direction.

In order to gain the altitude, all four motors of the quadcopter must increase the speed of rotation simultaneously and similarly to descend down, the speed of all four motors must be decreased simultaneously. The flight controller is the Brain of the Drone. This board is placed at the centre and responsible for controlling the firmware within the ESCs and consequently controls the spin rate of the motors.

The quadcopter cannot function accurately and efficiently without the use of external sensors added with the flight controller. So for a stable and precise flight different sensors like Accelerometer, Gyroscope, Inertia measurement unit (IMU) are used and interfaced with the flight controllers and to make a quadcopter fly better some additional sensors like Barometer, Distance measuring sensors, GPS, Magnetometer could be used.

In order to make the drone agile, the acceleration and de-acceleration of the drone must be quick, that means that it should pitch forward in the beginning and when it is time to stop, the quadcopter should pitch in the opposite direction quickly in an aggressive angle. It is necessary so as to decrease the stopping distance. Secondly for the drone to be agile, the quadcopter must be able to turn quickly with a small turning radius.