

# Basic Drones Dynamics

*DASL 106*

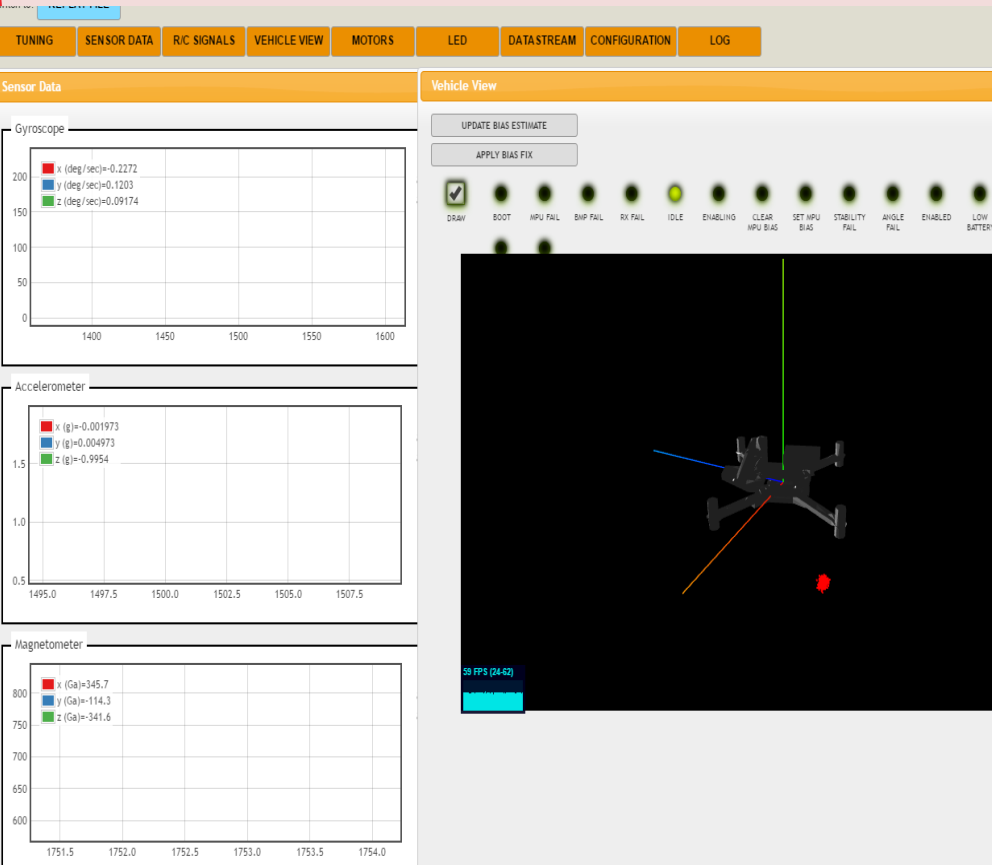
*Dongbin Kim.*



# Contents : Week 2

- Rotor Response - Hover
- Rotor Response - Roll
- Rotor Response - Pitch
- Rotor Response - Yaw

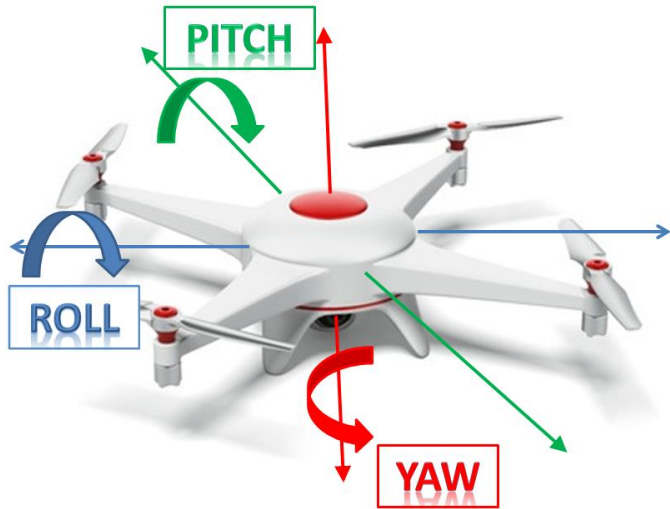
# Rotor Resposne – Lego Flybrix Chrome Extension.



- Chrome Extension – Lego Flybrix.

1. Simply downloaded in Google Chrome.
2. Data is streamed through USB from flight board.
3. Allows Tuning, Sensor data check, Motor response.
4. From this Lesson, Every rotor response is simulated by the extension.

# Rotor Resposne – Hover



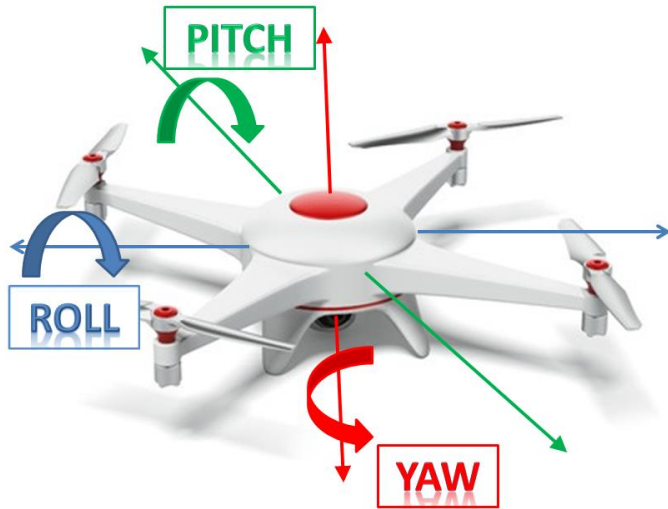
- Hover.

1. All the motors rotate at the same speed.
2. The rotation speed must be sufficient enough for the quadcopter to generate a 'lift' counteracting its own weight, but not so much that the quadcopter keeps climbing in altitude
3. The torque effect acting on the body of the quadcopter by each of the motors should be cancelled out.

- Experience with LegoFlybrix.

- R/C signal response check
- Motor response.

# Rotor Resposne – Roll



- Roll.

1. Move to side to side

2. To the left : the speed of the right of the quadcopter should increase relatively.

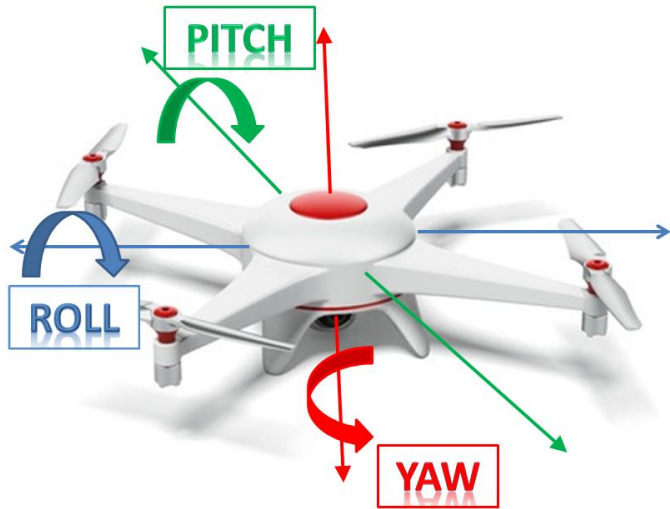
3. To the right : the speed of the left of the quadcopter should increase relatively

- Experience with LegoFlybrix.

-R/C signal response check

-Motor response.

# Rotor Resposne – Pitch



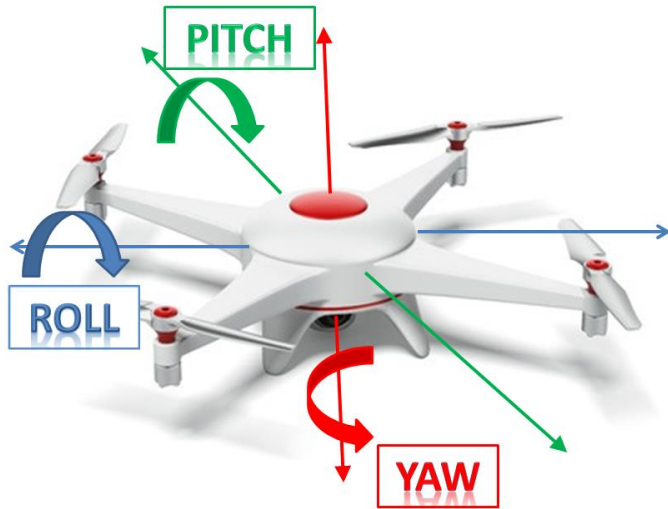
- Pitch

1. Fly forward or backward (Nose up or down)
2. To forward : The speed of rotors at the rear must increase.
3. To backward : The speed of rotors on the front must increase
4. The speed of rotors one side increase, another side decrease

- Experience with LegoFlybrix.

- R/C signal response check
- Motor response.

# Rotor Resposne – Yaw



- Yaw

1. Rotation movement by torques.
2. To the clockwise : the rotors with counter-clockwise propellers rotate relatively faster than others.
3. To the counterclockwise : the rotors with clockwise propellers rotate relatively faster than others.

- Experience with LegoFlybrix.

- R/C signal response check
- Motor response.

# Homework

- Report Rotor response of 3 movement with Graph.