

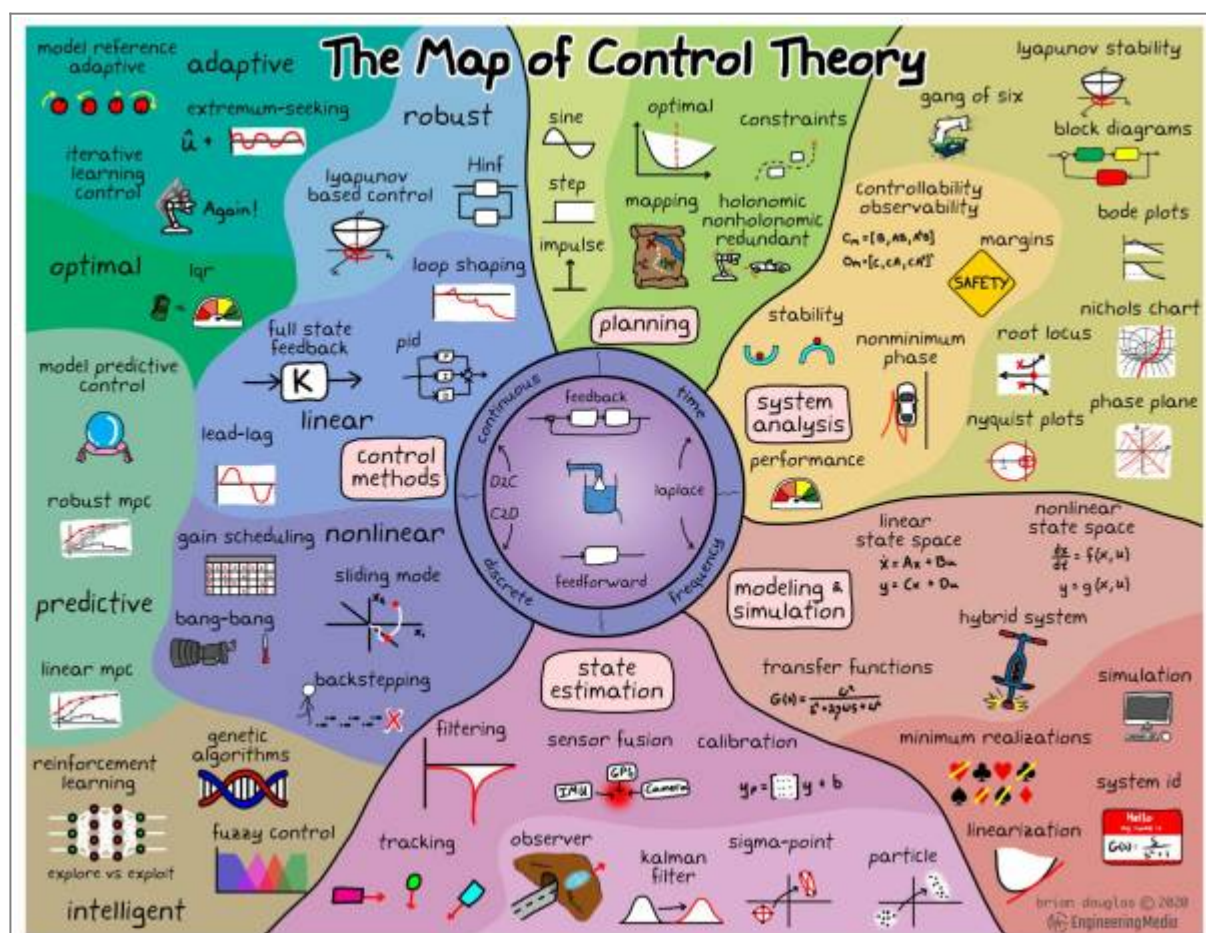
EMRP2022

Topics: Wireless sensor networks to collect environmental data, Interactive web dashboards and databases to display data, Drone technology, sensor integration, and image analysis

Closed loop control

PID Control Theory

https://www.youtube.com/watch?v=wkfEZmsQqiA&list=PLn8PRpmsu08pQBjxYFXSsODEF3Jqmm-y&a_b_channel=MATLAB



<https://engineeringmedia.com/map-of-control> Fig. 1

Inverted Pendulum with PID

Optimal control of inverted pendulum system using PID controller, LQR and MPC

<https://iopscience.iop.org/article/10.1088/1757-899X/263/5/052007/pdf>

Stabilising an Inverted Pendulum Controller with PID controller

https://www.matec-conferences.org/articles/mateconf/pdf/2018/11/mateconf_eureca2018_02009.pdf

Control the Ryze Tello Drone from Python

- **tello-pathon** code by Harley Lara:
<https://github.com/harleylara/tello-python>
- **RyzeTelloHSRW** code by Ilgar Rasulov (EligoSoftware):
<https://github.com/eligosoftware/ryzetellohsrw>

git

git for dummies (eli5): https://www.youtube.com/watch?v=mj-qvsxPHpY&ab_channel=NickWhite

git for professionals:

https://www.youtube.com/watch?v=Uszj_k0DGsg&ab_channel=freeCodeCamp.org

useful resources

ardupilot: <https://ardupilot.org/copter/index.html#>

PX4: <https://docs.px4.io/main/en/>

Quadcopter construction guide:

https://docs.px4.io/main/en/frames_multicopter/dji_f450_cuav_5plus.html

OpenDroneMap: <https://opendronemap.org/>

MAVlink: <https://mavlink.io/en/>

Dronekit: <https://dronekit.io/>

API: <https://dronekit-python.readthedocs.io/en/latest/automodule.html>

ROS: <http://wiki.ros.org/Documentation>

Jetson TX2: https://elinux.org/Jetson_TX2

ZED ROS wrapper: <https://github.com/stereolabs/zed-ros-wrapper>

Understanding 3-axis flight movement: <https://emissarydrones.com/what-is-roll-pitch-and-yaw>

IMU: <https://www.ceva-dsp.com/ourblog/what-is-an-imu-sensor/>

MAVROS: https://dev.px4.io/v1.11_noredirect/en/ros/mavros_installation.html

<https://404warehouse.net/2015/12/20/autopilot-offboard-control-using-mavros-package-on-ros/>

Companion computers:

<https://ardupilot.org/dev/docs/companion-computers.html#companion-computers>

IntelRealSense camera: <https://github.com/IntelRealSense/librealsense>

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