[AMv2 Ch 3 & 4]

goal: further develop modeling tools & apply them to physical phenomena

topics:

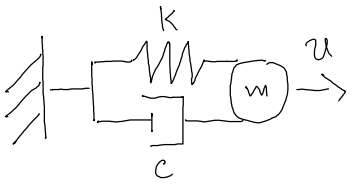
1°. modeling [AMv2 Ch 3] [Nv7 Ch 3,4,5]
  1¹. concepts
  1². state space models
  1³. numerical simulation

2°. examples
  2¹. RLC circuit
  2². quadrotor

1°. modeling

1¹. concepts

ex: spring-mass-damper:



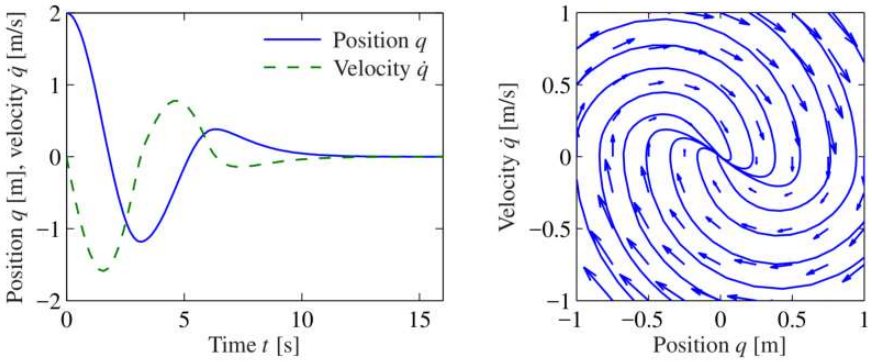


Figure 3.2: Illustration of a state model. A state model gives the rate of change of the state as a function of the state. The plot on the left shows the evolution of the state as a function of time. The plot on the right, called a *phase portrait*, shows the evolution of the states relative to each other, with the velocity of the state denoted by arrows.

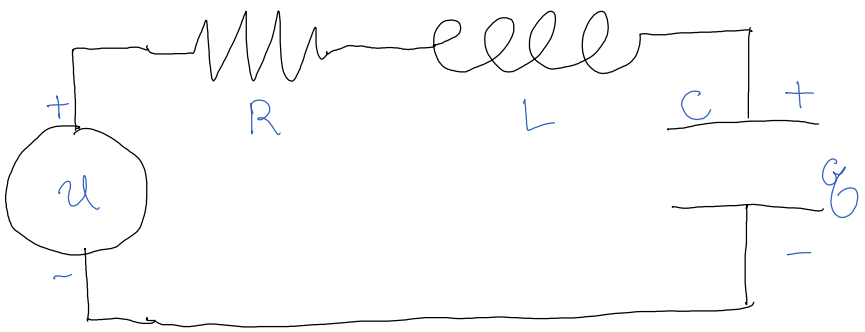
12: state-space models

1³. numerical simulation

2º. examples

2¹. RLC circuit

2. RLC circuit



2². quadrotor

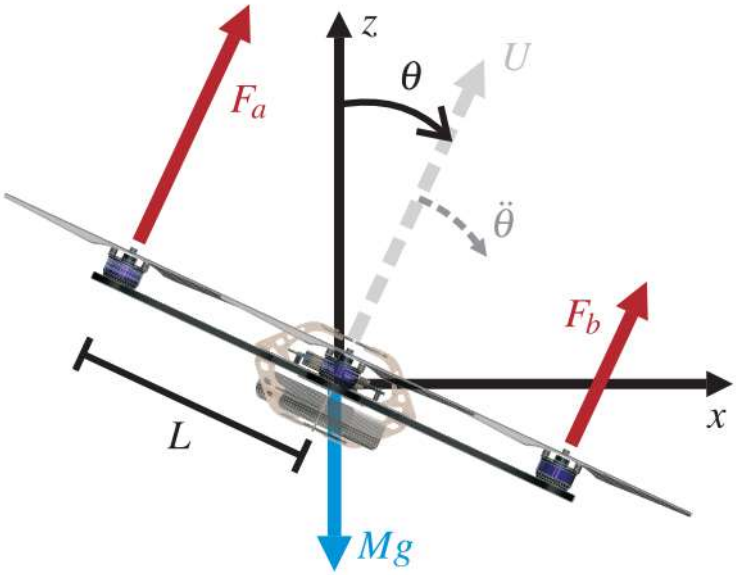
2010 IEEE International Conference on Robotics and Automation [ICRA]
Anchorage Convention District
May 3-8, 2010, Anchorage, Alaska, USA

2010 IEEE International Conference on Robotics and Automation
Anchorage Convention District
May 3-8, 2010, Anchorage, Alaska, USA

[ICRA]

A Simple Learning Strategy for High-Speed Quadrocopter Multi-Flips

Sergei Lupashin, Angela Schöllig, Michael Sherback, Raffaello D'Andrea



$$M\ddot{z} = (F_a + F_b + F_c + F_d)\cos\theta - Mg \quad (1)$$

$$M\ddot{x} = (F_a + F_b + F_c + F_d)\sin\theta \quad (2)$$

$$I_{yy}\ddot{\theta} = L(F_a - F_b)\,, \quad (3)$$