



Introduction to

V



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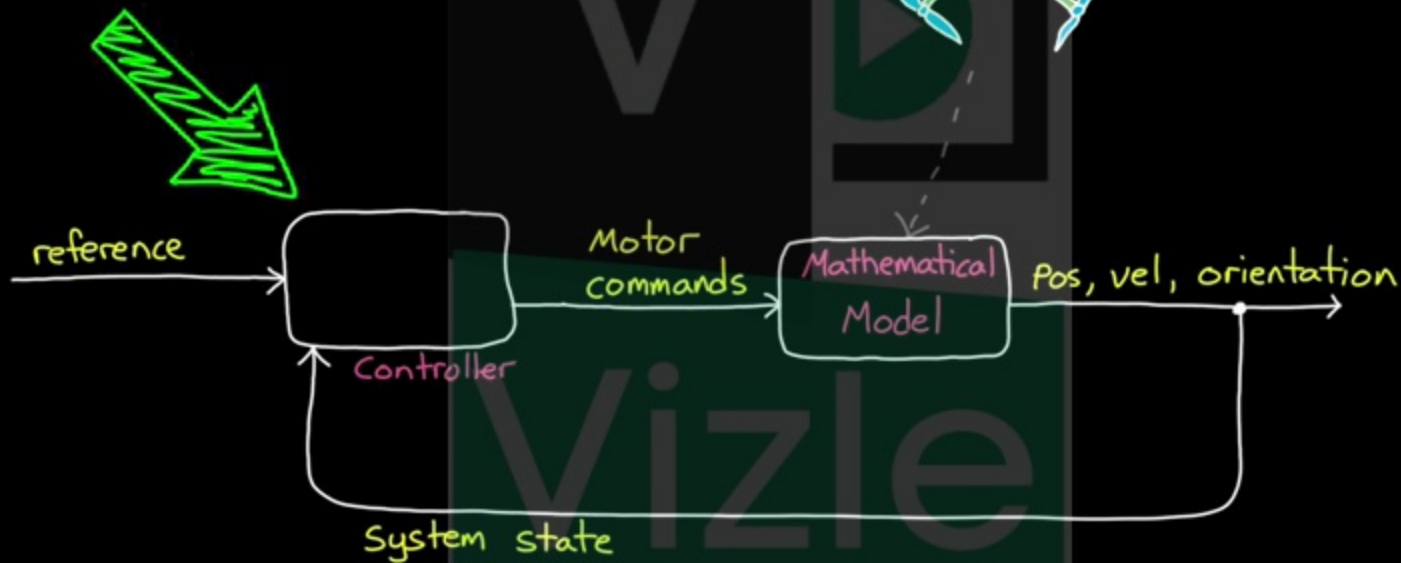
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get this to hover

Motor
commands

Pos, vel, orientation



Why are models wrong?

Complex dynamics



Uncertain driving forces



Intentional simplicity



$$F = k \cdot x$$

linear

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How do we get around this problem? Add margin!
Don't just meet stability but exceed it by an amount

Classical gain and phase margin

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Live Editor - /Users/brian/Documents/MATLAB/classical_margins.mlx

LIVE EDITOR INSERT VIEW

New Open Save Find Files Compare Go To Text Normal Task Control Run Section Run and Advance Run Step Stop

FILE NAVIGATE TEXT CODE SECTION RUN

classical_margins.mlx

Open loop transfer function

$$G(s) = \frac{0.38(s^2 + 0.1s + 0.55)}{s(s + 1)(s^2 + 0.06s + 0.5)}$$

```
1 % Define the transfer function
2 s = tf('s');
3 G = 0.38*(s^2 + 0.1*s + 0.55)/(s*(s+1)*(s^2 + 0.06*s + 0.5));
4
5 % Get classical gain and phase margin
6 margin(G)
```





There are more methods to analyze robustness

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