

Picking a Motor

Questions to Ask

- What type of system?
 - Admittance or Impedance Type System
- What fidelity is needed?
 - Generally High fidelity
- What type of actuator?
 - Generally a DC motor

General Steps

1. Pick a motor
 1. We operate our motors close to stall. Determine how much torque you would like the motor to output as well as at what speed. Verify that the maximums lie within the speed-torque curve for the given power supply voltage and current limit.
2. Find a power supply that can source the desired voltages and currents.
3. Find a current amplifier that can source the desired current.

General Comments

- Power-to-weight ratio should be large
 - Want to be able to output a large amount of torque, yet have only a small amount of inertia in the system
- Torque commanded to the device does not equal the actual torque output of device
 - Actual motor torque is less than commanded as a result of losses in the system: friction, inertia, compliance, and possibly back EMF
- Gearing can increase torque output as well as ‘encoder’ resolution
 - Note that gearing increases inertia, which is not desirable

Motor Companies

- Maxon motors
 - Pros:
 - JHU Haptics laboratory is familiar with this motor
 - Low torque ripple
 - Cons:
 - Customer support is less than ideal
- Faulhaber
- Pittman
- Escap
- Kollmorgen