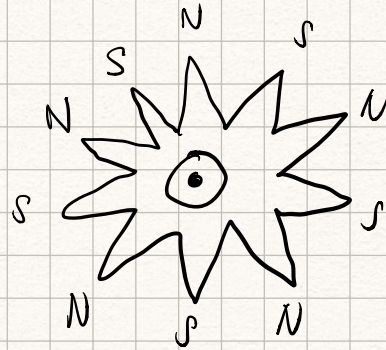
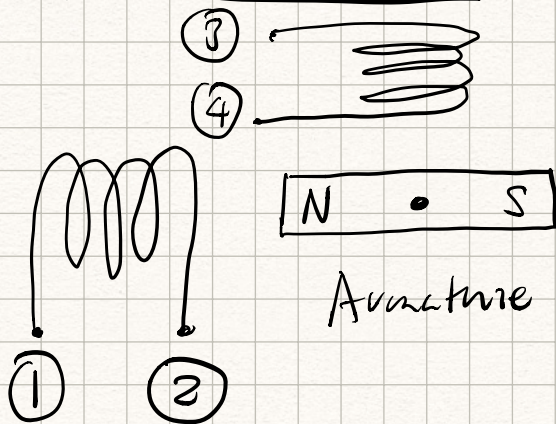


MEECH 423 Lecture 13

Stepper Motors



Half Stepping

Whole Stepping

Step	Armature dir	①	②	③	④
1.	←	H	L	L	L
2.	↑	L	L	H	L
3.	→	L	H	L	L
4.	↓	L	L	L	H

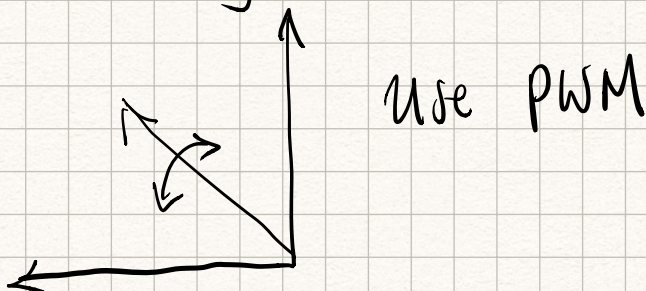
	①	②	③	④
1. ←	H	L	L	L
2. ↖	H	L	H	L
3. ↑	L	L	H	L
4. ↗	L	H	H	L
5. →	L	H	L	L
6. ↘	L	H	L	H
7. ↓	L	L	L	H
8. ↙	H	L	L	H

Lab 3 stepper motor:

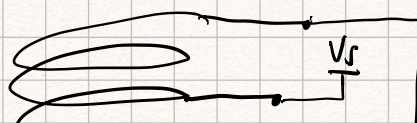
64 steps/rev.

5. 625° per step.

Micro-stepping

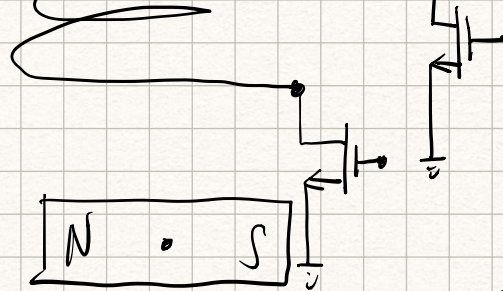
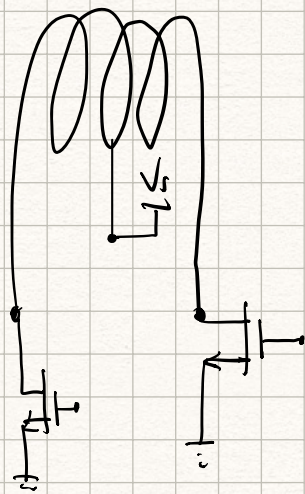


Bipolar vs. Unipolar steppers.



Bipolar steppers

- Need 2 H-bridges



- 4 wires.

Unipolar Stepper

- Need 4 mosfets

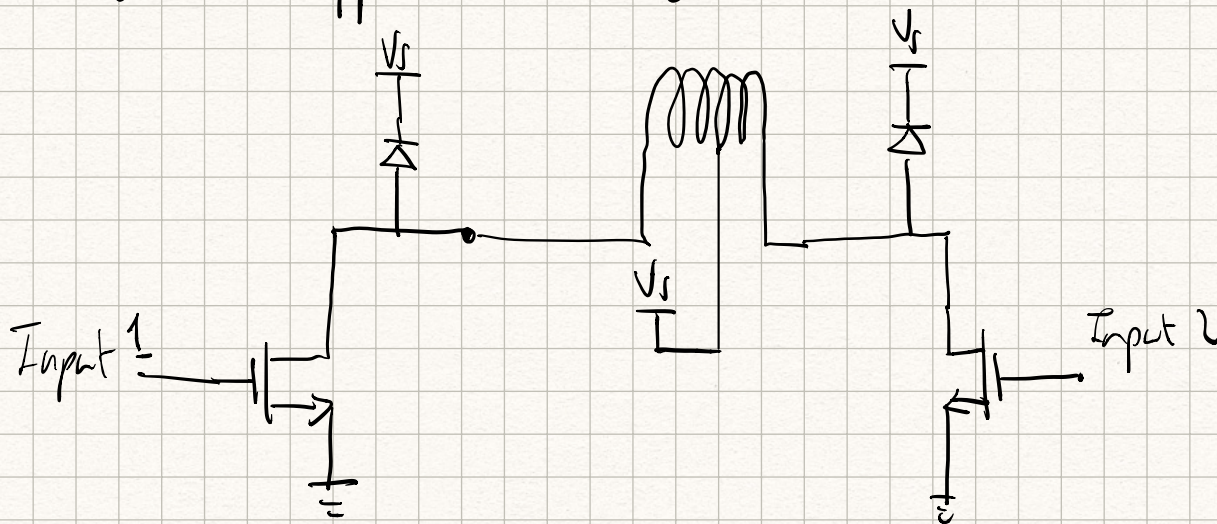
- Only $\frac{1}{2}$ of the coil is used

- $\sim 70\%$ of torque.

- Need 6 wires

* All unipolar steppers can be used as bipolar steppers.

Lab 3 Stepper motor driver:



* Use a lookup table in your firmware