

IcSCI

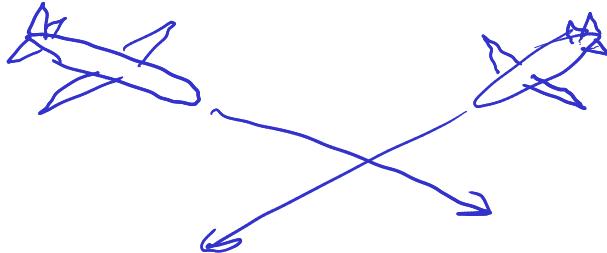
ASEN 5264

**Decision Making under
Uncertainty**

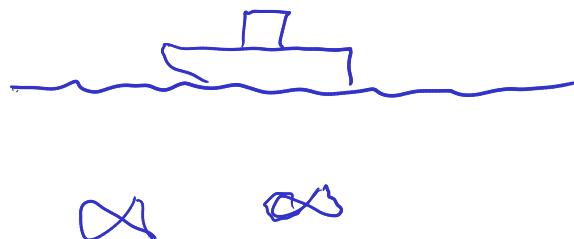
✓

3 Example Problems

A/C Collision Avoidance



Fishery MGMT

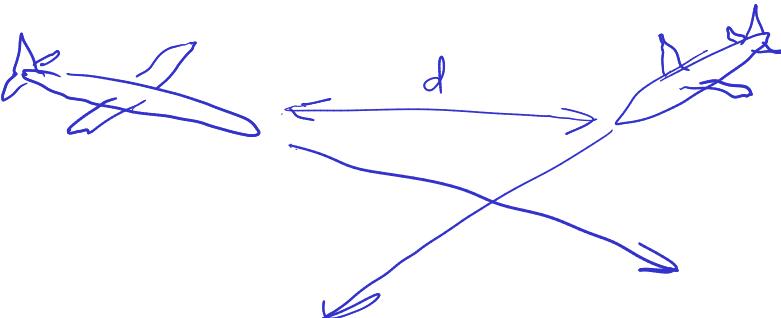


Health Screening

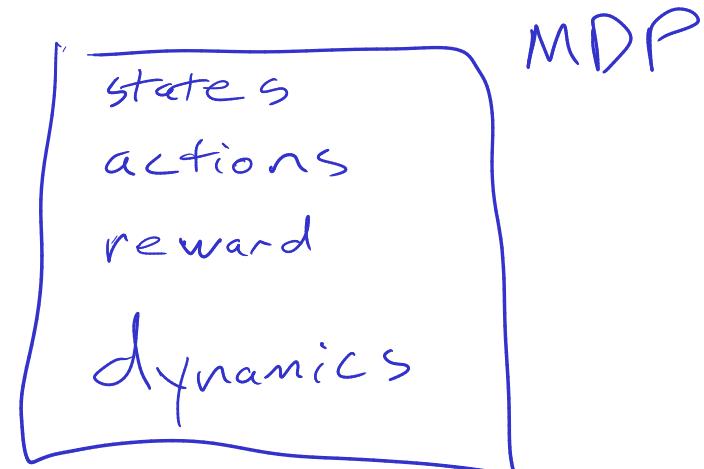
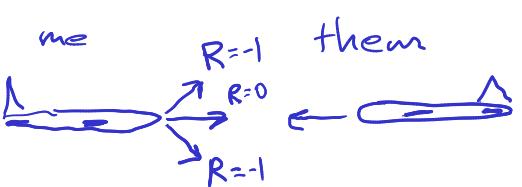


A/C Collision Avoidance

$$R(s,a) = \begin{cases} -1000 & \text{if } s = \text{collision} \\ -1 & \text{for maneuver} \end{cases}$$



sensor measurements
~~error in measurements~~
desired outcome



Find policy that maximizes

$$\pi(s) = \underset{a \in A}{\operatorname{argmax}} R(s,a)$$

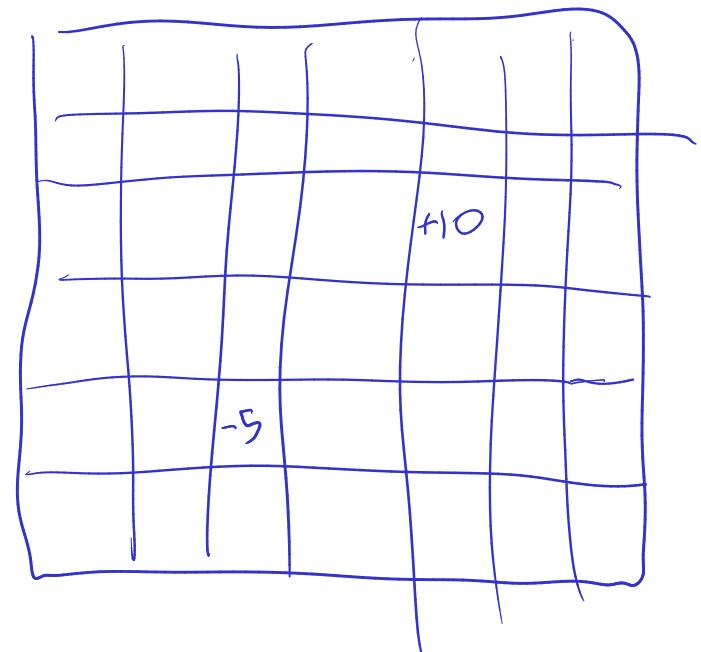
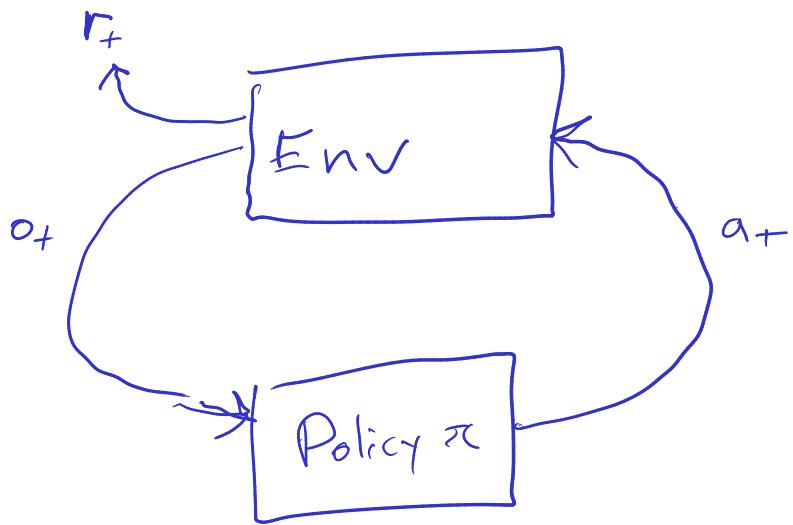
A red curved arrow points from the text "Find policy that maximizes" to this equation.

A graph of a function $f(x)$ plotted against x . The curve has a local maximum at point x and a global maximum at a later point. A dashed horizontal line labeled "max" indicates the global maximum. A vertical line labeled "argmax" points to the point x on the curve where it reaches its local maximum.

current and future rewards

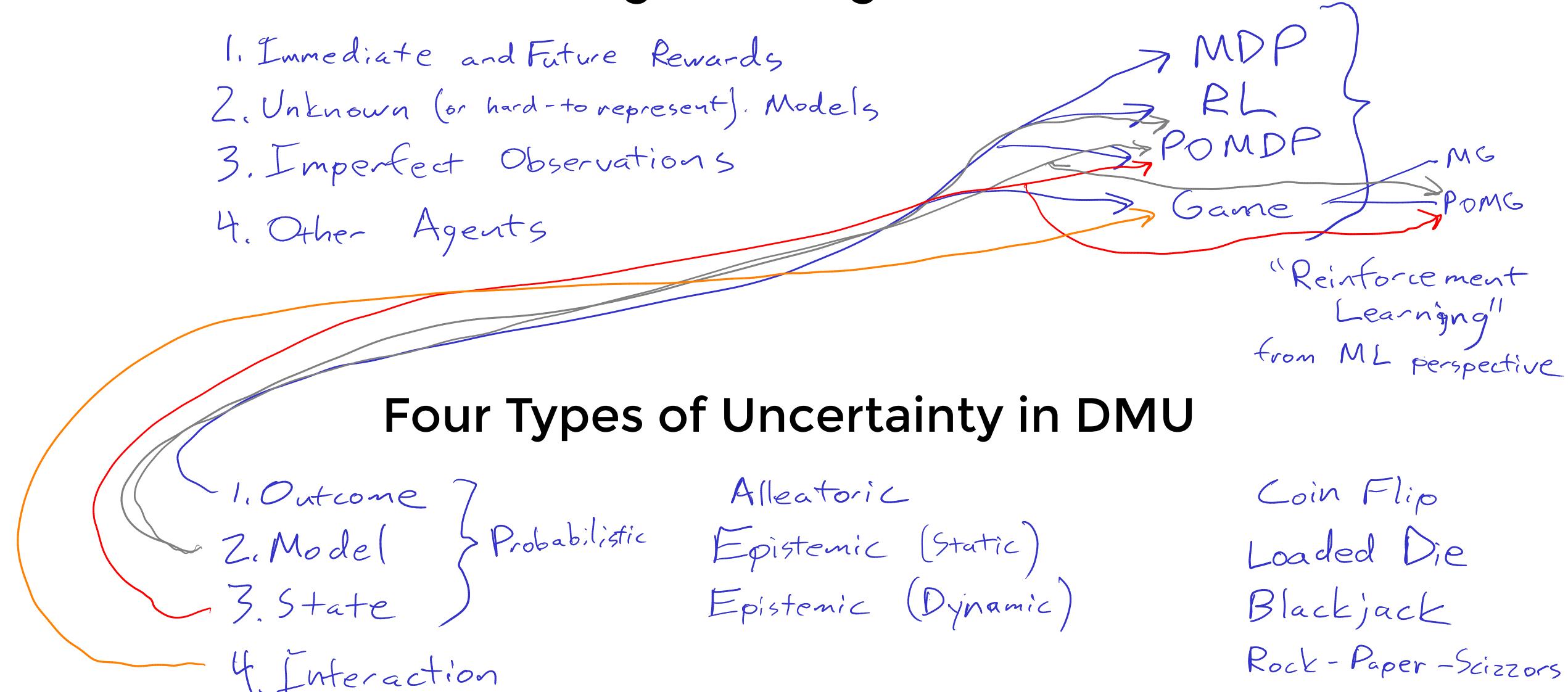
Sense-Plan-Act Loop

$$\pi = \underset{\pi \in \Pi}{\operatorname{argmax}} \sum_{t=0}^{\infty} r_t$$



Four Big Challenges in DMU

1. Immediate and Future Rewards
2. Unknown (or hard-to-represent). Models
3. Imperfect Observations
4. Other Agents



Break

Break

- Engineering is a team sport!

Break

- Engineering is a team sport!
- Groups of 2-4:
 - Name
 - Department
 - Sequential decision making problem

Course Materials/Logistics

Course Materials/Logistics

- Piazza

Course Materials/Logistics

- Piazza
- Syllabus

Course Materials/Logistics

- Piazza
- Syllabus
- Book

Course Materials/Logistics

- Piazza
- Syllabus
- Book
- Homework

Course Materials/Logistics

- Piazza
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- Book
- Homework
- Julia

A bit about me

A bit about me



A bit about me



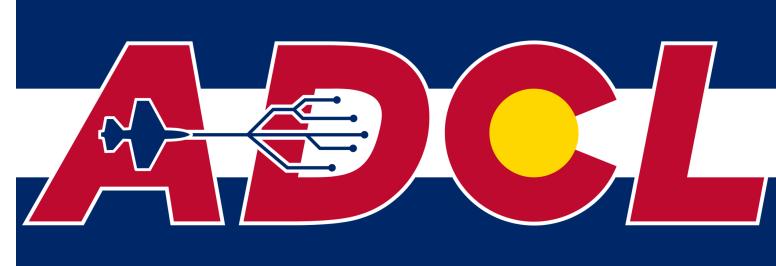
A bit about me



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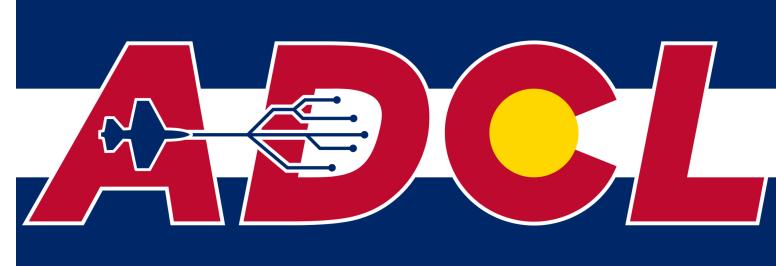


A bit about me



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