

# Multiagent RL

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**MULTIAGENT** RL

**ONE WAY**  
DEPT. OF TRANSPORTATION



What is Multiagent RL about?

What is the (or a) scientific question?

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Alpha Go

Economics

should?

behaviour?

RL in environment w/ MA

How does rewards affect behaviour

- Agents behaviour influencing each other

PBT

Collaboration/Competition

Agents acknowledging other agents

DO NOT  
ENTER

2014

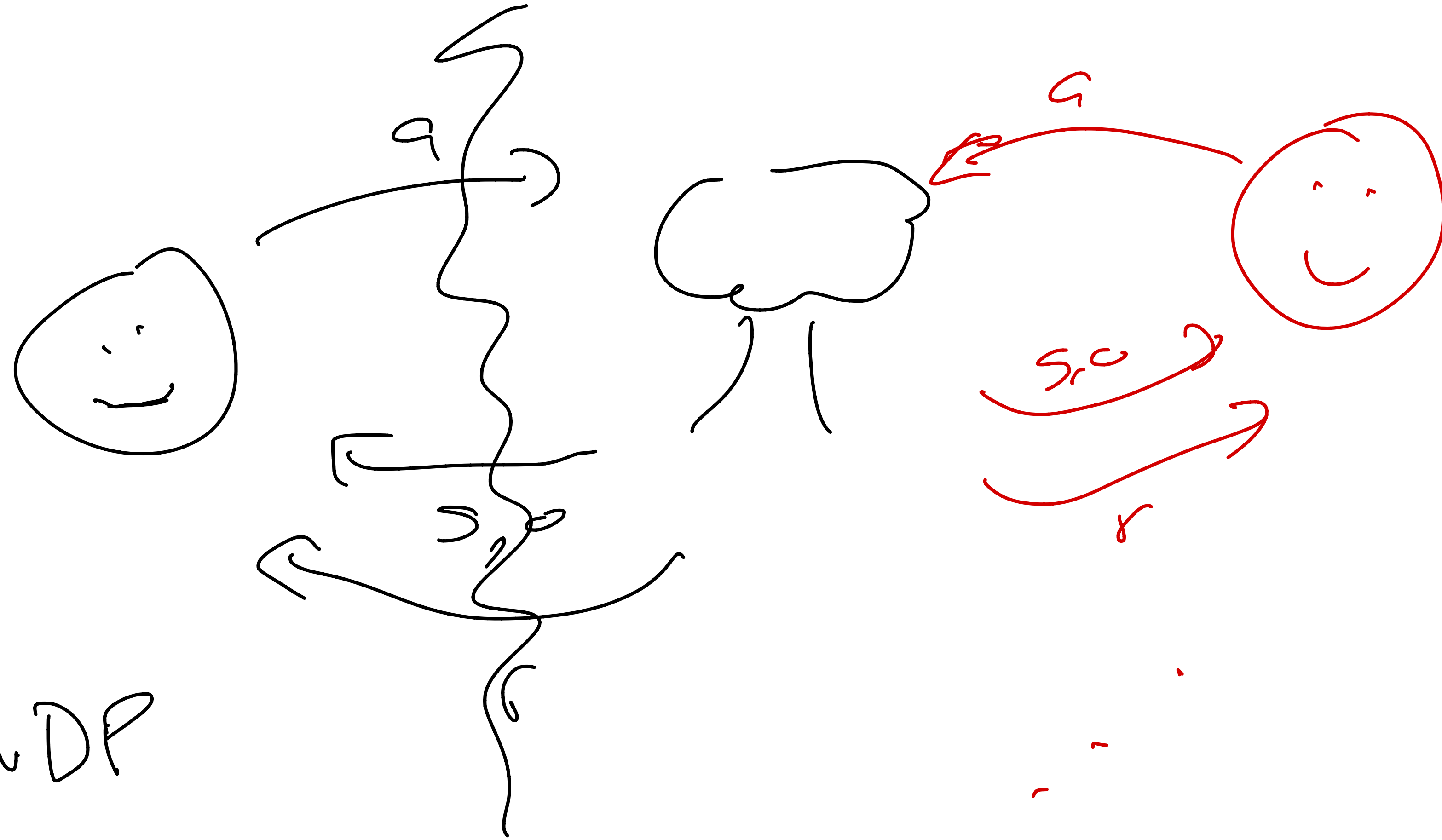
WRONG  
WAY

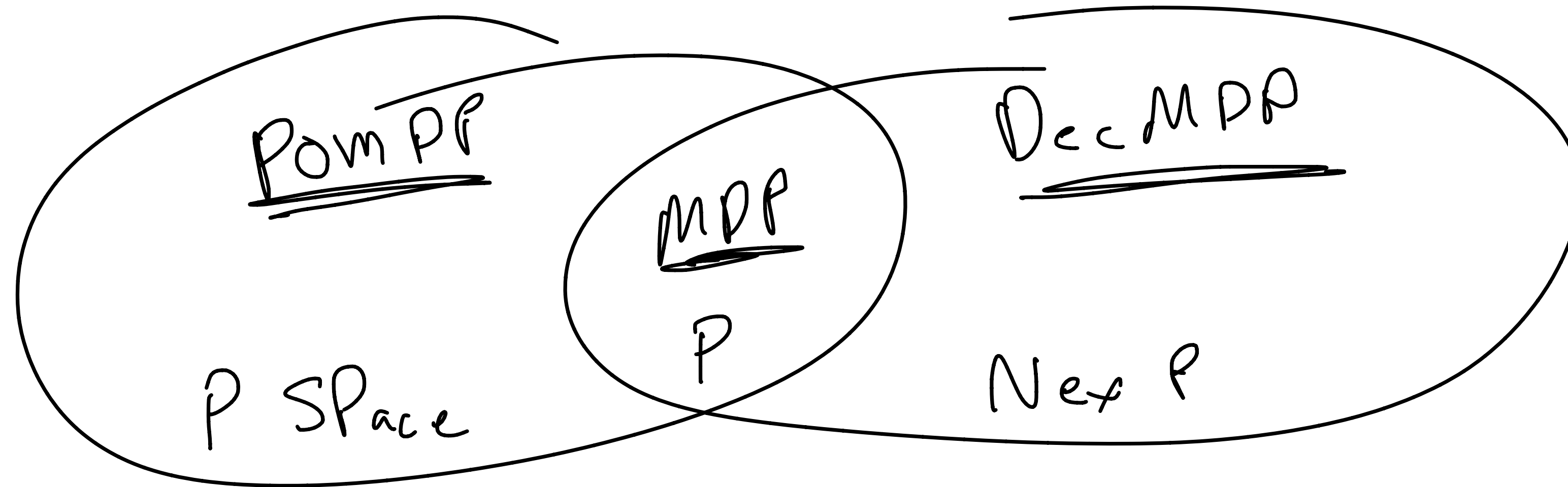
2014

The image shows a highway signpost with two signs. The primary sign is a circular red sign with a white horizontal bar across the center, with the words 'DO NOT' above the bar and 'ENTER' below it. This sign is mounted on a white rectangular background. To its right, a smaller rectangular red sign with white text reads 'WRONG WAY'. Both signs are mounted on a metal post. The background shows a clear blue sky with some light clouds and distant mountains.

WRONG  
WAY

Dec MDP





	A	B
A	2, 2	0, 0
B	0, 0	1, 1



*RL SOCIOLOGY*

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# GAME THEORY

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MDP

$$\operatorname{argmax}_{\pi}$$

$$V^{\pi}(s)$$

$$V_i^{\pi}$$

$$\pi_i$$

two-player  
zero-sum

$$\operatorname{argmax}_{\pi_i \in \Pi} \min_{\pi_{-i}}$$

$$V^{\pi_i, \pi_{-i}}(s) \quad d(\pi_{-i} | \pi_i)$$

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Nash Equilibria

$$\forall i \pi_i' \quad V^{\pi_i, \pi_{-i}}(s) \approx V^{\pi_i', \pi_{-i}}(s)$$



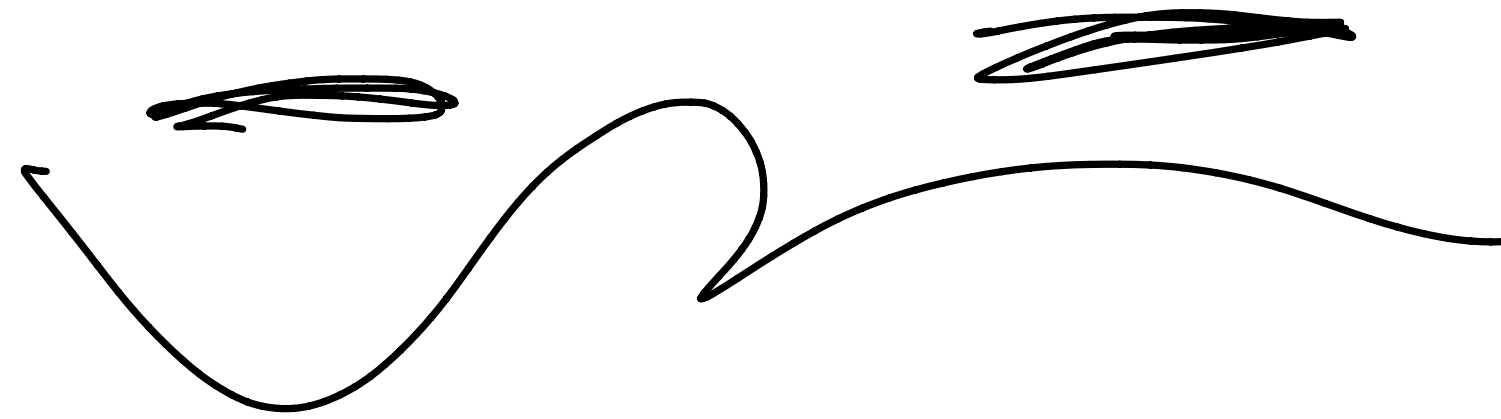
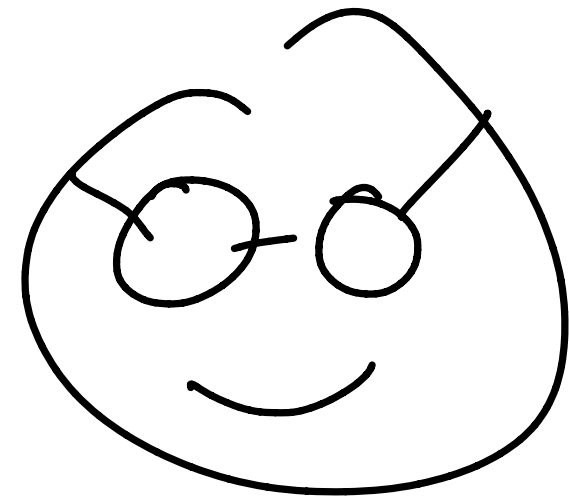
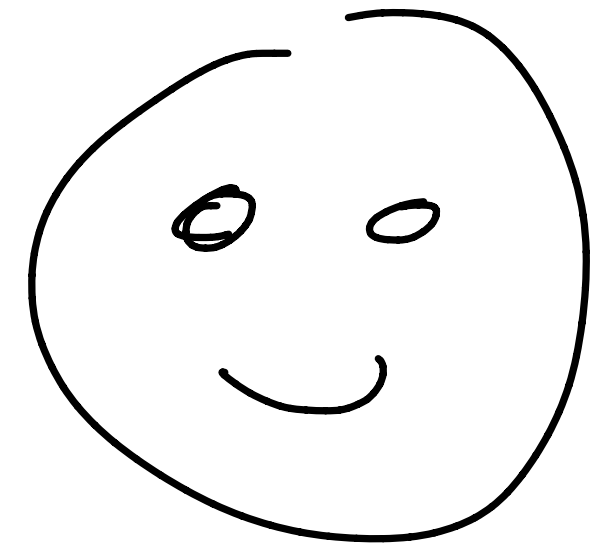
	A	B
A	3, 3	0, 4
B	(4) 0	(1) 1



# *THEORY OF MIND*

**ONE WAY**  
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**Theory of mind is the ability to attribute mental states—beliefs, intents, desires, emotions, knowledge, etc.—to oneself, and to others, and to understand that others have beliefs, desires, intentions, and perspectives that are different from one's own.**

*Wikipedia*



*THANK YOU*

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