

October, 21

From 10:15 to 11:45

Room C 412, Sand 14

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Metacognitive Efficiency in Learned Value-based Choice

Abstract:

"Metacognition- the ability to judge how confident we are on our own decisions - is a key aspect of human intelligence. To measure it, researchers often use *metacognitive efficiency*, which compares confidence to actual performance. In simple perceptual tasks, this is done with the M-ratio.

But in reinforcement learning, where task difficulty constantly changes, such normalization is not straightforward.

We propose a new approach inspired by the M-ratio. We create a *Backward model* that uses people's confidence ratings to simulate a "virtual" decision-maker. Comparing its virtual performance to the real one gives us two new metrics: **Backward performance**, which captures metacognitive sensitivity, and **MetaRL.Ratio**, which measures efficiency.

Across both simulations and human data, we find that MetaRL.Ratio is independent of task accuracy and remains stable even when task difficulty changes. This makes it a promising tool for studying metacognition in dynamic, value-based decision-making."