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Thinking with limited resources

Wednesday 8 November 2023 14:45 (45 minutes)

I will show using examples that many neural circuits and computational algorithms of the brain perform efficiently amid severe resource constraints. By extension, I will argue that the processes we call cognition and learning are only needed because of these limitations: circuits of the brain must adaptively infer minimal summaries, syntheses and approximations of the world. These represenations compress the information from the world that permits a bounded computational engine to predict the future and decide appropriate behavior. I will present evidence that such inference processes in humans satisfy a principle of parsimony, akin to Occam's Razor, where subjects favor simple but sufficient mental models for tasks.

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