iCog-Labs
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ROCCA

ROCCA which means Rational OpenCog Controlled Agent, is a project aiming at creating an opencog agent that acts rationally in OpenAI Gym environments.

Even though ROCCA relies on PLN (Probabilistic Logic Networks) for both learning and planning, practically most of the learning is handled by the pattern miner which is a specialized form of PLN reasoning. For planning, PLN, combined with its temporal reasoning rules, is used to discover cognitive schematics. The decision-making module, though currently hardwired, draws inspiration from OpenPsi but improves upon it by using Thompson Sampling, a more rational approach to balancing exploration of new options and exploitation of known strategies.

For now what is considered learning in ROCCA is, being able to:

- Discover temporal patterns based on directly observable events via the pattern miner.
- Turn these temporal patterns into plans (cognitive schematics).
- Combine these plans to form new plans, possibly composed of new action sequences, via temporal deduction.

The future plans for the ROCCA project are:

- Add more sophisticated temporal (including dealing with longs lags between cause and effect) and then spatial inference rules.
- Integrate ECAN, for Attention Allocation, to dynamically restrict the atomspace to subsets of items to process/pay-attention-to.
- Record attention spreading to learn/improve Hebbian links.
- Carry concept creation and schematization (crystallized attention allocation).
- Record internal processes, not just attention spreading, as percepta to enable deeper forms of instrospective reasoning.
- Plan internal actions, not just external, to enable self-growth.