Summary

AI Planning: Theory and Practice

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- AI Planning: what is it, how it works, why is it important

- Planning theory: formalisms, models, languages and algorithms

- Modeling: transformations, use-cases, approaches

- Tools and applications: hands on with ML pipeline exploration

The good news: planning can solve really hard problems

- ML pipeline exploration: **match handcrafted pipeline accuracy** with a simple grammar [ICAPS 2020]

- Hypothesis generation/Analytic automation: Predict hosts that will contact a malware domain up to **8 hrs before contact** [SPARK 2016]

- Scenario Planning: generate scenarios **~30x faster than experts** for first scenario, **~3000x** for subsequent scenarios [AAAI 2021 Demo]

Things we should improve

- Expressing problems in a formal planning language is a barrier. Knowledge engineering tools to assist users are critical.
    - Reusability of application domain <-> planning domain transformations
    - Development tools that go end-to-end
- Multiple plans/choices/variants are key
- AI planning is faster to prototype than custom domain solutions, but we still need faster prototyping/experimentation frameworks.

Q&A