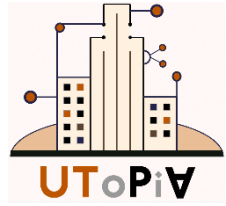


Program Synthesis for Robot Learning from Demonstrations (LfD)

AM
RL

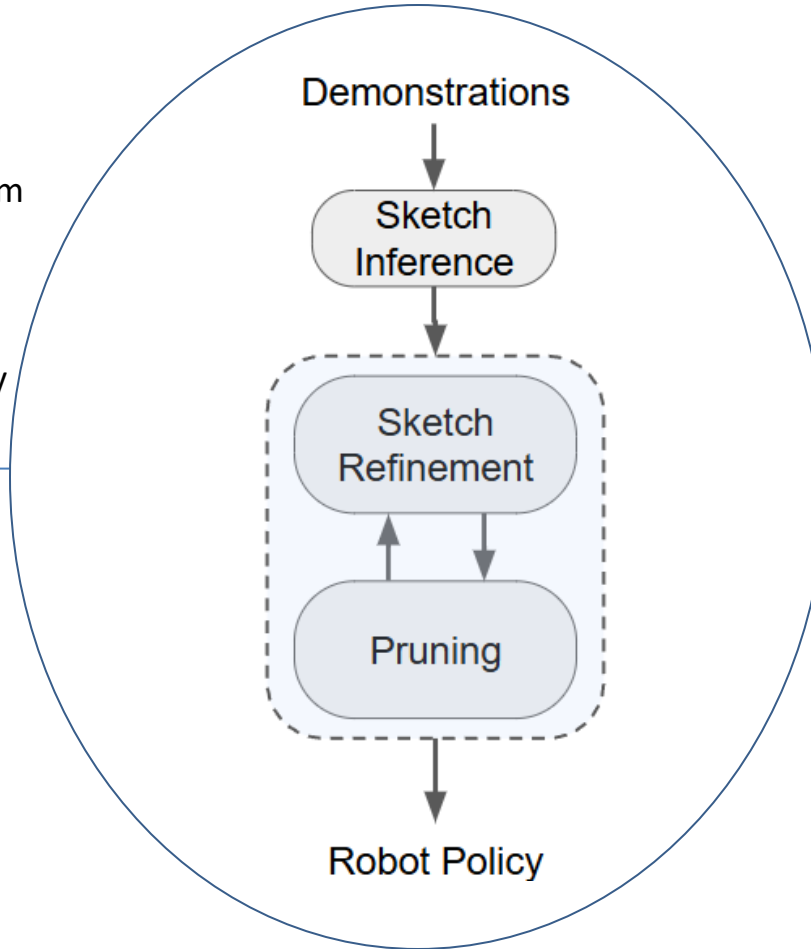


Challenge:

- Robotic policies suffer from low interpretability
- Difficult to represent robotic policies as interpretable and formally verifiable programs

Solution:

- Sketch inference using off the shelf RegEx learner
- LLM guided sketch refinement
- RegEx based partial program over-approximation pruning



Scientific Impact:

- A new programmatic LfD algorithm that targets long-horizon robot tasks
- Novel technique for proving partial program unrealizability from demonstrations
- Applications to programs involving grounded objects

Broader Impact and Broader Participation:

- Towards robust, interpretable, and verifiable robotic deployments
- Enables non-expert users to generate policies
- Involved Undergraduate, Masters, and PhD researchers

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The NSF Formal Methods in the Field PI Meeting (2024 FMitF PI Meeting)

November 12-13, 2024 | The University of Iowa | Iowa City, Iowa