Policy Continuation with Hindsight Inverse Dynamics

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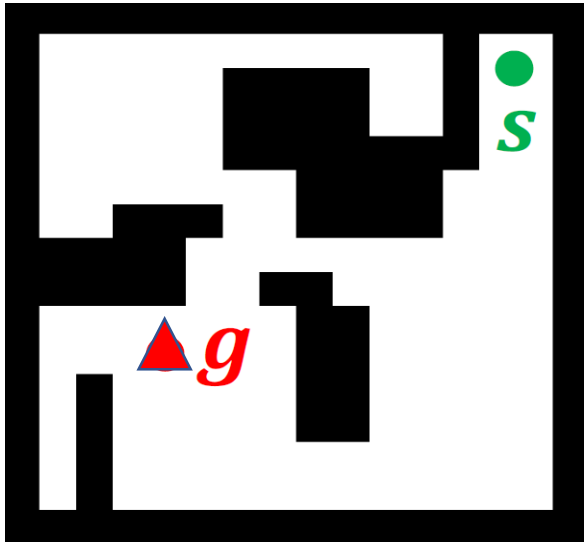
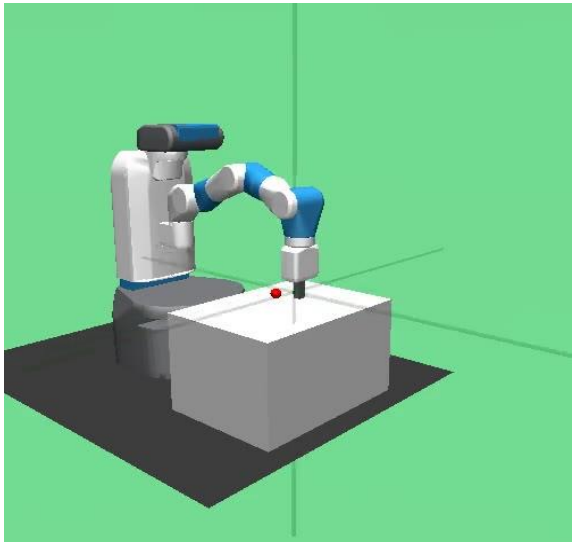
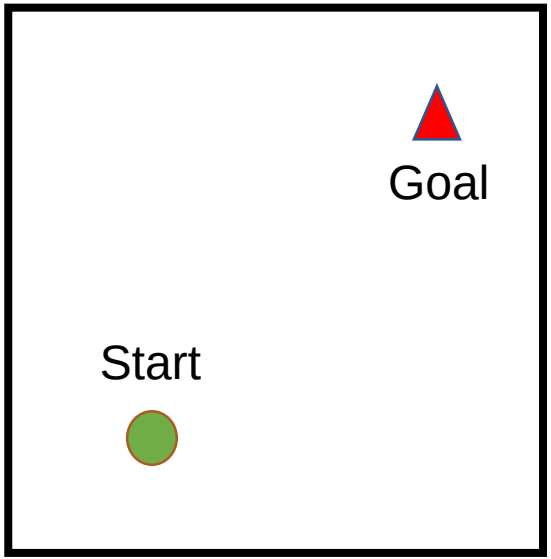
Goal-Oriented Reward Sparse Tasks

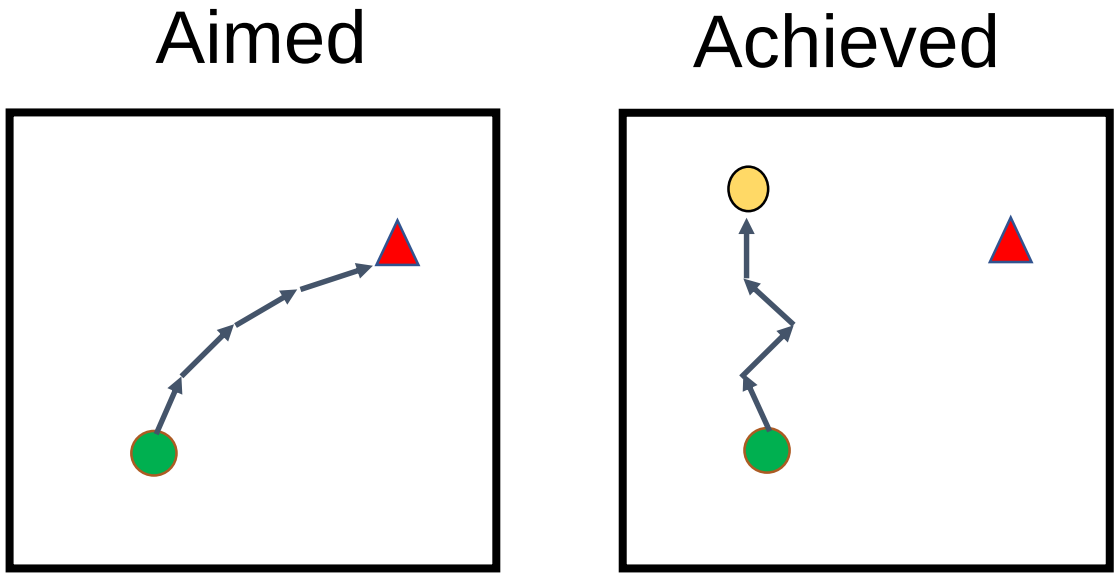






Inspirations from Human Learning

1. Learning from failures
[Hindsight Experience Replay, M Andrychowicz et al. 2017]



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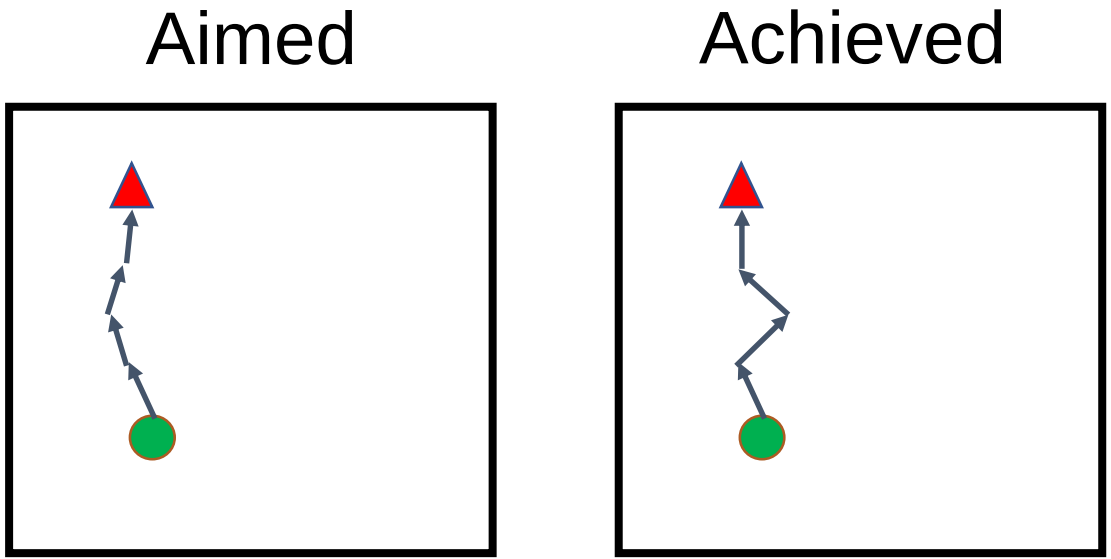
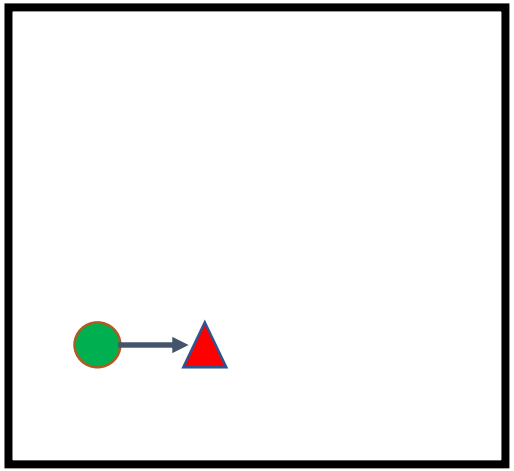


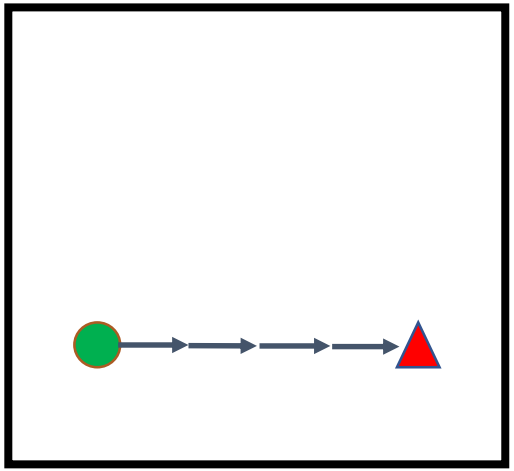
Inspirations from Human Learning

1. Learning from failures
2. Extrapolating Success

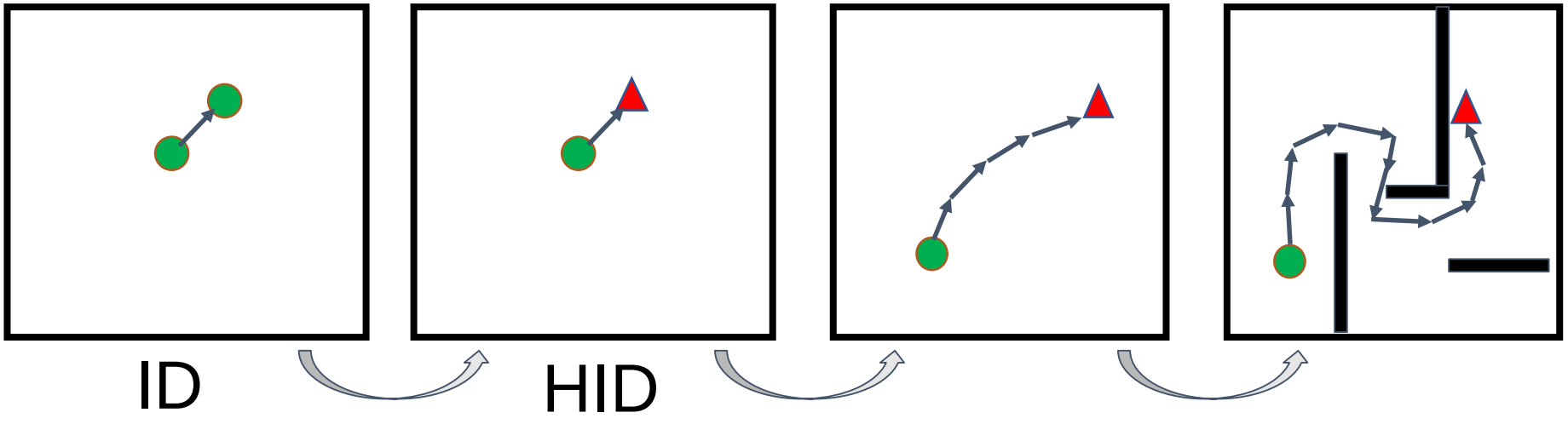
Learned



Extrapolate



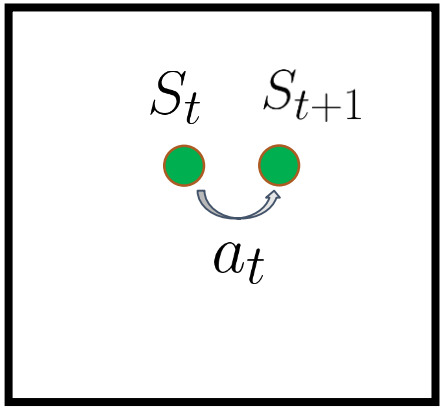
Our Proposed Method



1.Hindsight 2. Extrapolate 3. Policy Continuation

Equipe Inverse Dynamics with Hindsight

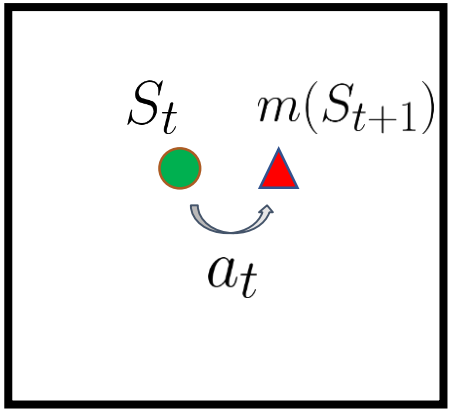
Inverse Dynamics:



State

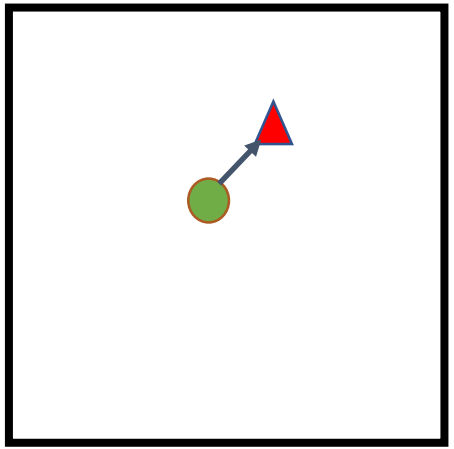
Goal

Hindsight Inverse Dynamics:

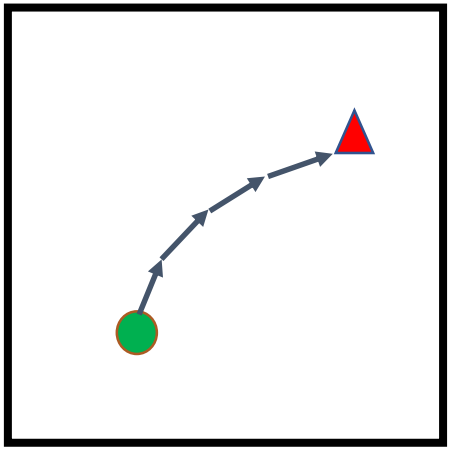


$$g = m(S_{goal})$$

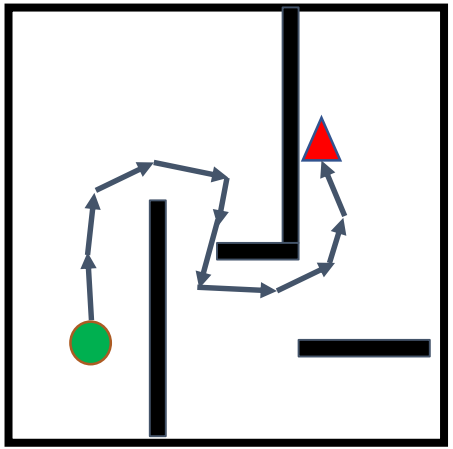
1-step HID Is Not Enough



1-step HID



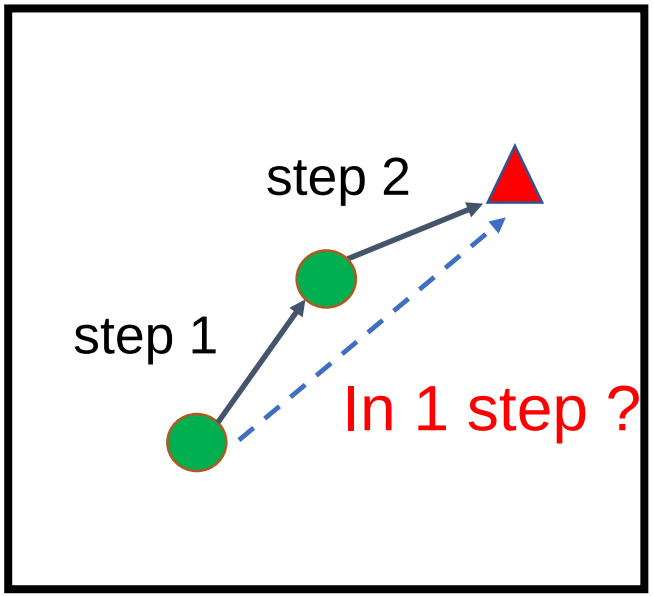
Linear Case



Non-linear Case

Multi-step Optimality?

Policy Continuation: Test the optimality recursively



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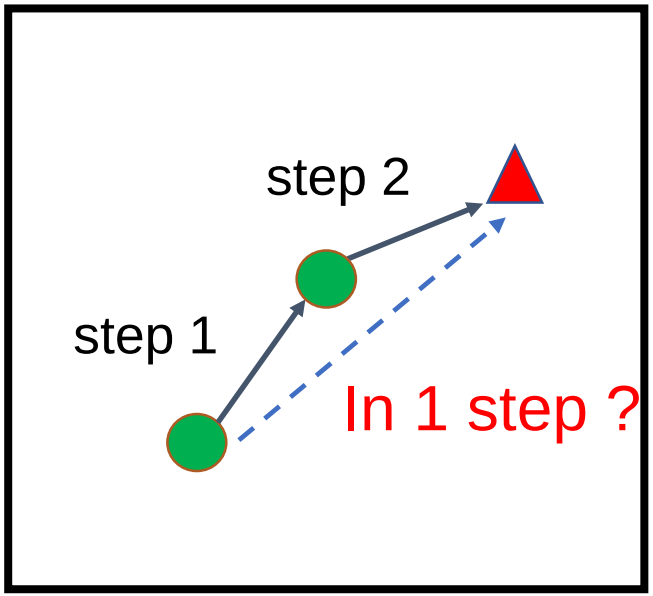

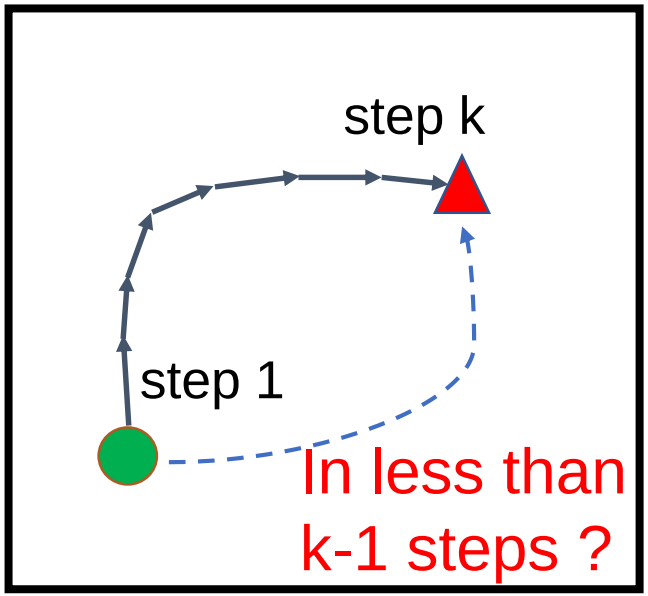

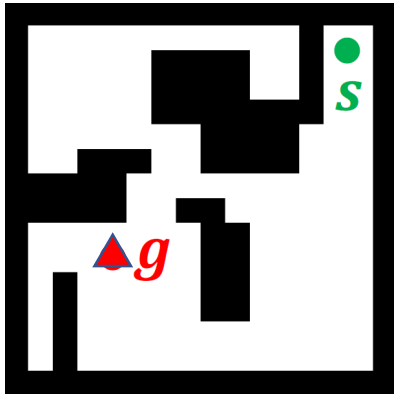

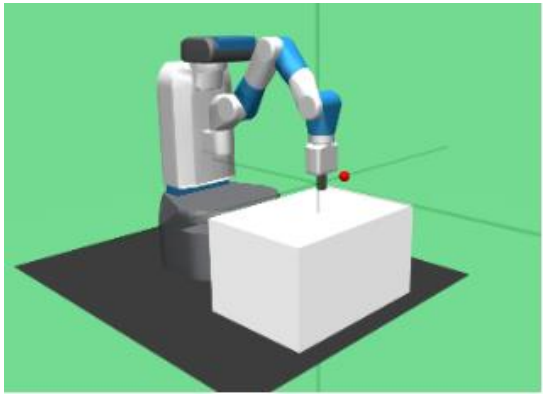

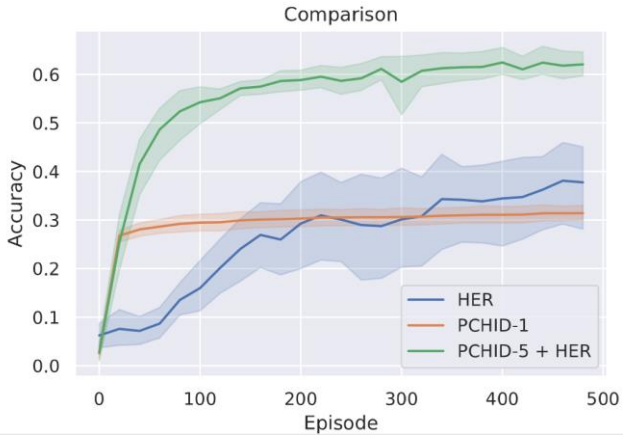

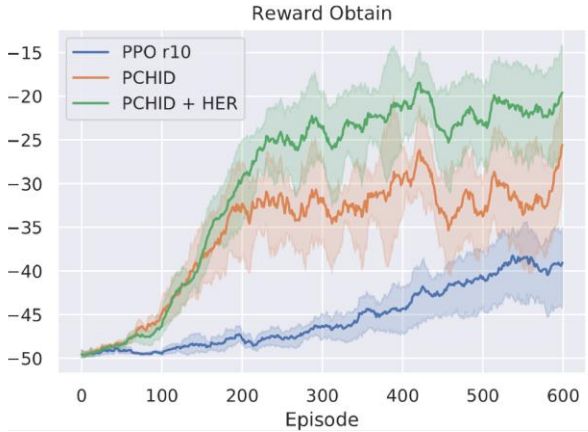

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