Visual Reinforcement Learning with Imagined Goals

Ashvin Nair*, Vitchyr Pong*, Murtaza Dalal, Shikhar Bahl, Steven Lin, Sergey Levine
Autonomous Learning
Autonomous Learning
Autonomous Learning

Reinforcement Learning?
Autonomous Learning: Proof of Concept
Reinforcement Learning with Imagined Goals (RIG)
Reinforcement Learning with Imagined Goals (RIG)

Autonomous goal setting
Reinforcement Learning with Imagined Goals (RIG)

Autonomous goal setting

Vision input
Reinforcement Learning with Imagined Goals (RIG)

Autonomous goal setting

Vision input

Real-world results
RIG: Autonomous Learning
RIG: Autonomous Learning
RIG: Autonomous Learning
RIG: Autonomous Learning
RIG: Test Time
RIG: Test Time
Simulation: Autonomous Exploration
Simulation: Autonomous Exploration
Simulation: Test Time
Simulation: Other Environments

State \( x \)

Human-specified Goal \( x_g \)
Real-world Experiments

- No human supervision
- Directly from vision
- 0.5-2.5 Hours
Reinforcement Learning with Imagined Goals: Conclusion

Environments: https://github.com/vitchyr/multiworld/
Algorithm: https://github.com/vitchyr/rlkit
Website: https://sites.google.com/site/visualrlwithimaginedgoals/
Poster: #141