

A Framework for Flexibly Guiding Learning Agents (poster)

Elbarbari, Mahmoud Ahmed Hassan Mohamed

Publication date:
2022

[Link to publication](#)

Citation for published version (APA):

Elbarbari, M. A. H. M. (2022). *A Framework for Flexibly Guiding Learning Agents (poster)*. Poster session presented at AI Flanders VUB poster session, Brussels, Belgium.

Copyright

No part of this publication may be reproduced or transmitted in any form, without the prior written permission of the author(s) or other rights holders to whom publication rights have been transferred, unless permitted by a license attached to the publication (a Creative Commons license or other), or unless exceptions to copyright law apply.

Take down policy

If you believe that this document infringes your copyright or other rights, please contact openaccess@vub.be, with details of the nature of the infringement. We will investigate the claim and if justified, we will take the appropriate steps.

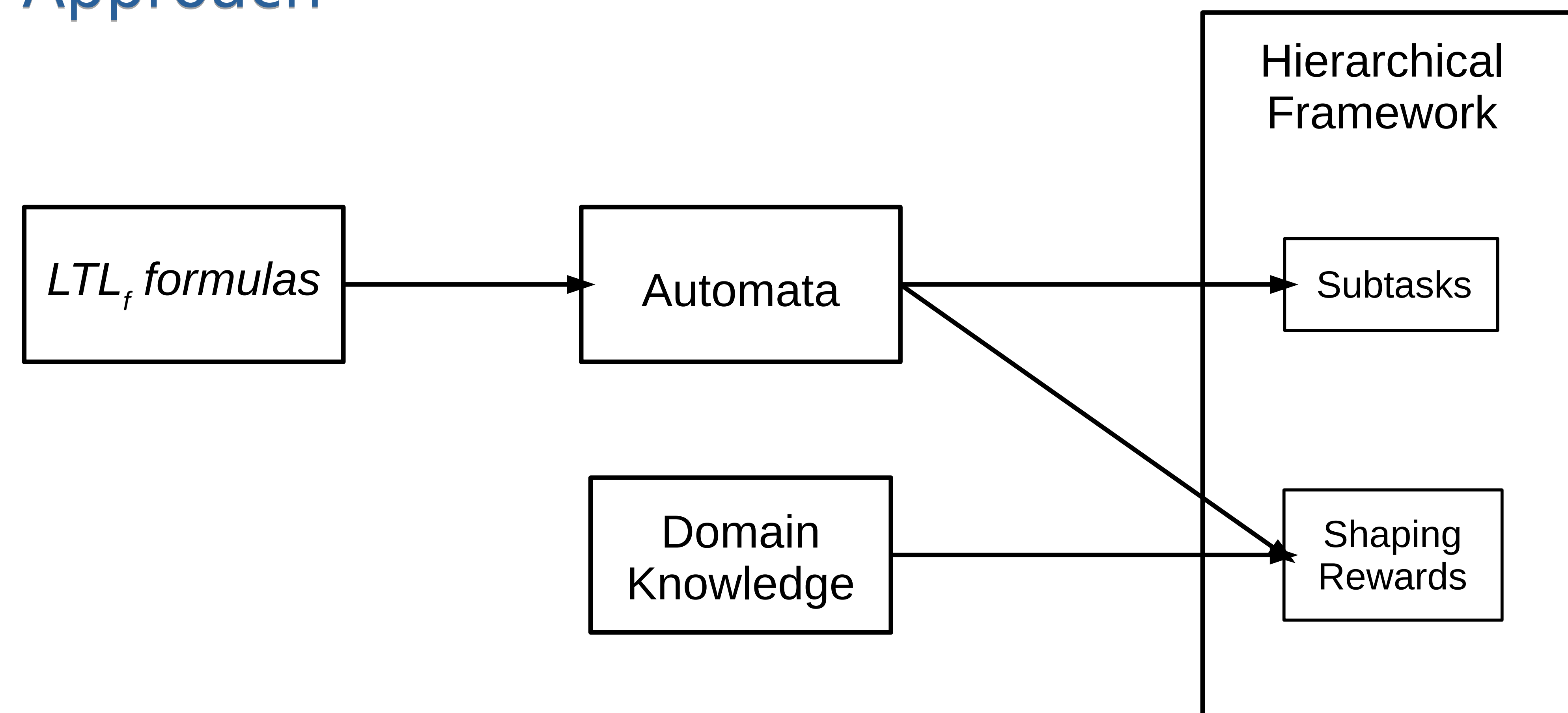
A Framework for Flexibly Guiding Learning Agents

M.Elbarbari, F.Delgrange, I.Vervillemmeren, K.Efthymiadis, B.Vanderborght, A.Nowe

Problem Definition

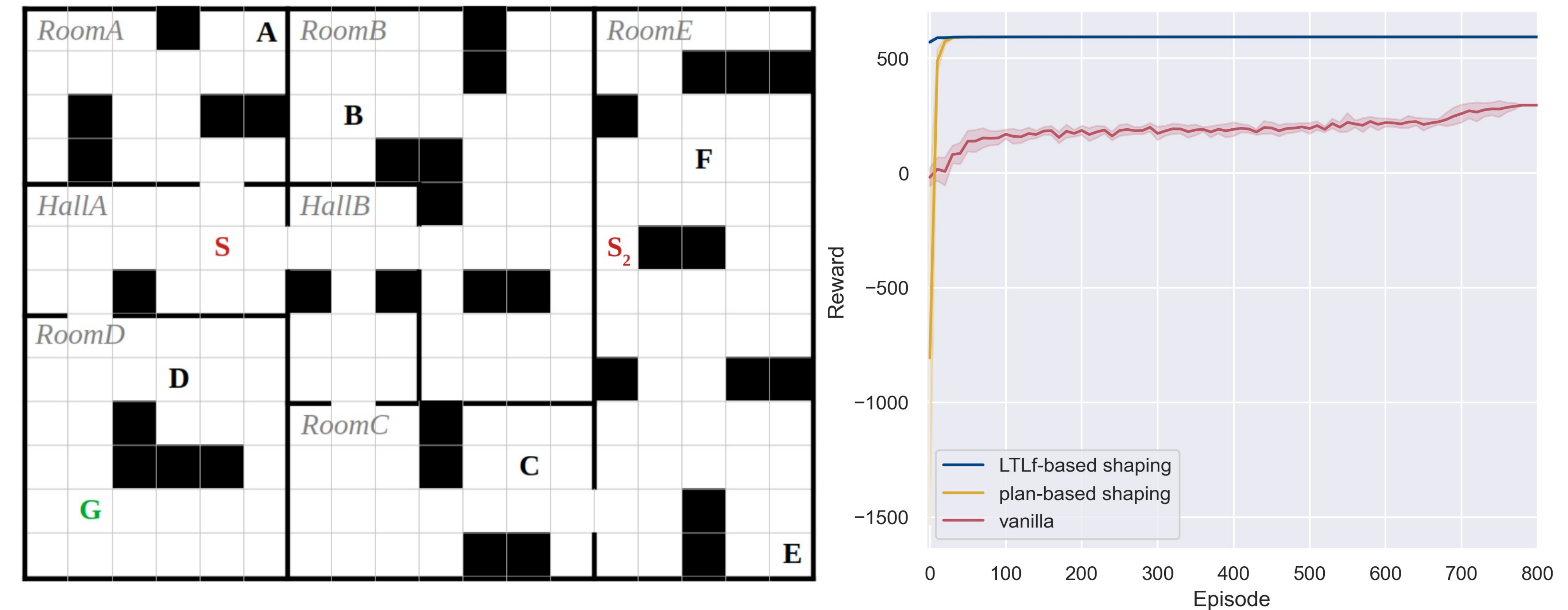
- A Reinforcement Learning (RL) agent typically takes **a huge number of trials** until it can reach a satisfying policy.
- This renders RL **unpractical in real world** applications e.g., robotics.
- We propose a framework to **flexibly communicate prior knowledge** to the learning agent.

Approach



Experiments

- We demonstrated our approach in several benchmark problems e.g., **flag collection domain**.
- The agents need to cooperate to collect the flags in the minimum number of steps.
- The user can have only **partial knowledge** of the optimal solution e.g., which agent should collect which set of flags.



- **Scenario**: the user knows which agent should collect which set of flags except for flag B.
- **LTLf advice**: the user guides the agents to choose between two solutions

$$F(\phi_1 \wedge \phi_2) \vee F(\phi_3 \wedge \phi_4)$$

The first proposed solution: the 1st collects flag B

$$\phi_1 = \langle have_flagA, * \rangle \wedge XF(\langle have_flagB, * \rangle \wedge XF(\langle have_flagD, * \rangle))$$

$$\phi_2 = \langle *, have_flagF \rangle \wedge XF(\langle *, have_flagE \rangle \wedge XF(\langle *, have_flagC \rangle))$$

The second proposed solution: the 2nd collects flag B

$$\phi_3 = \dots, \phi_4 = \dots$$

Work-in-progress

- Demonstrating our approach on a **machine tending task**: a team of mobile robots cooperate to pick up and deliver items during predefined time windows.

