

# SimpleDS: A Simple Deep Reinforcement Learning Dialogue System

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# Source

- H. Cuayáhuitl. SimpleDS: A Simple Deep Reinforcement Learning Dialogue System. International Workshop on Spoken Dialogue Systems (IWSDS), 2016. [<https://arxiv.org/abs/1601.04574>]

# Plan

- Reinforcement Learning for Dialogue Systems
- Introduction to Reinforcement Learning
- The *SimpleDS* Dialogue System
- Results



# Reinforcement Learning for Dialogue Systems

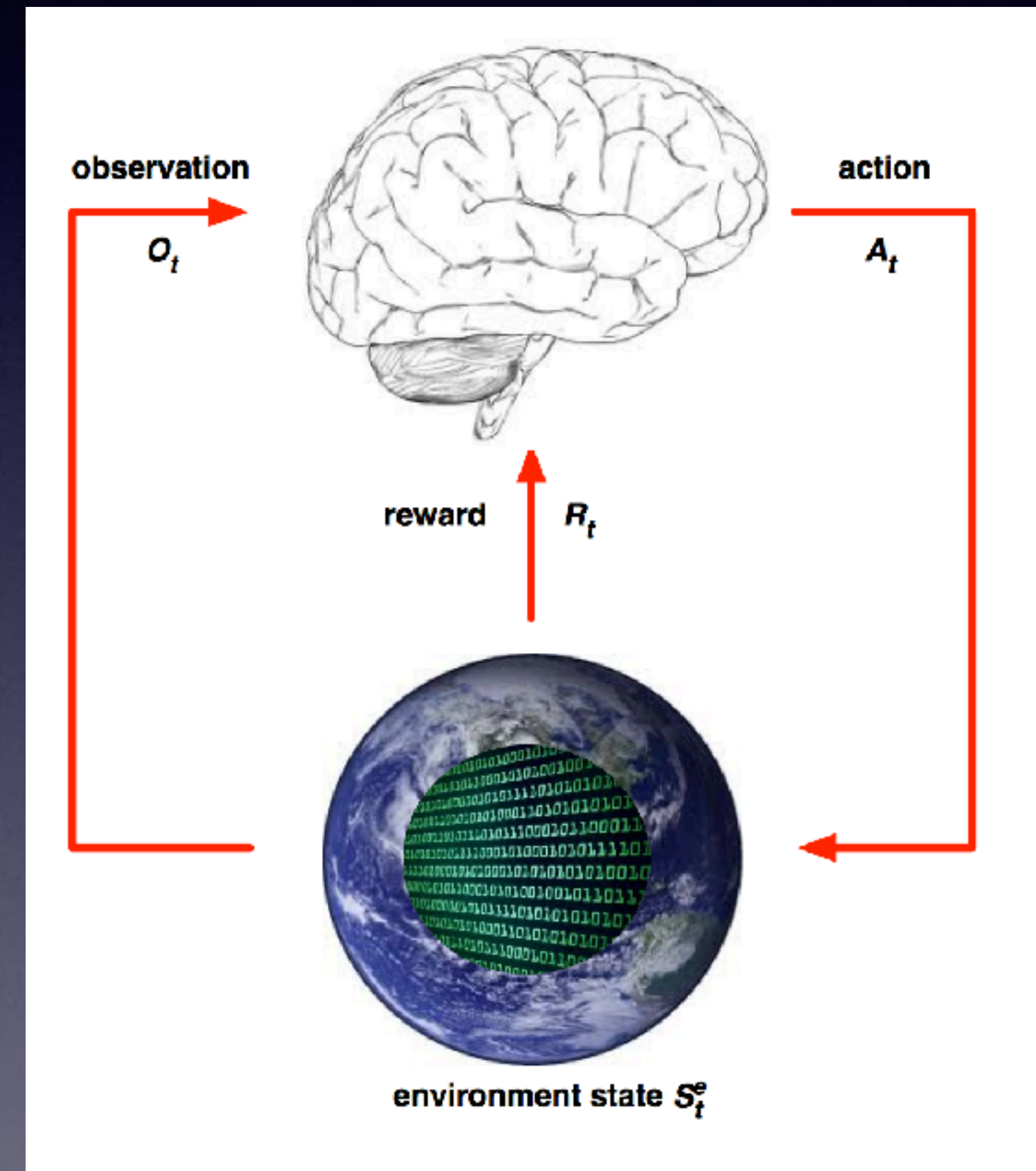
[illegible]

**Table 1** Example dialogue using the policy from Fig.2, where states are numerical representations of the last system and noisy user inputs, actions are dialogue acts, and user responses are in brackets



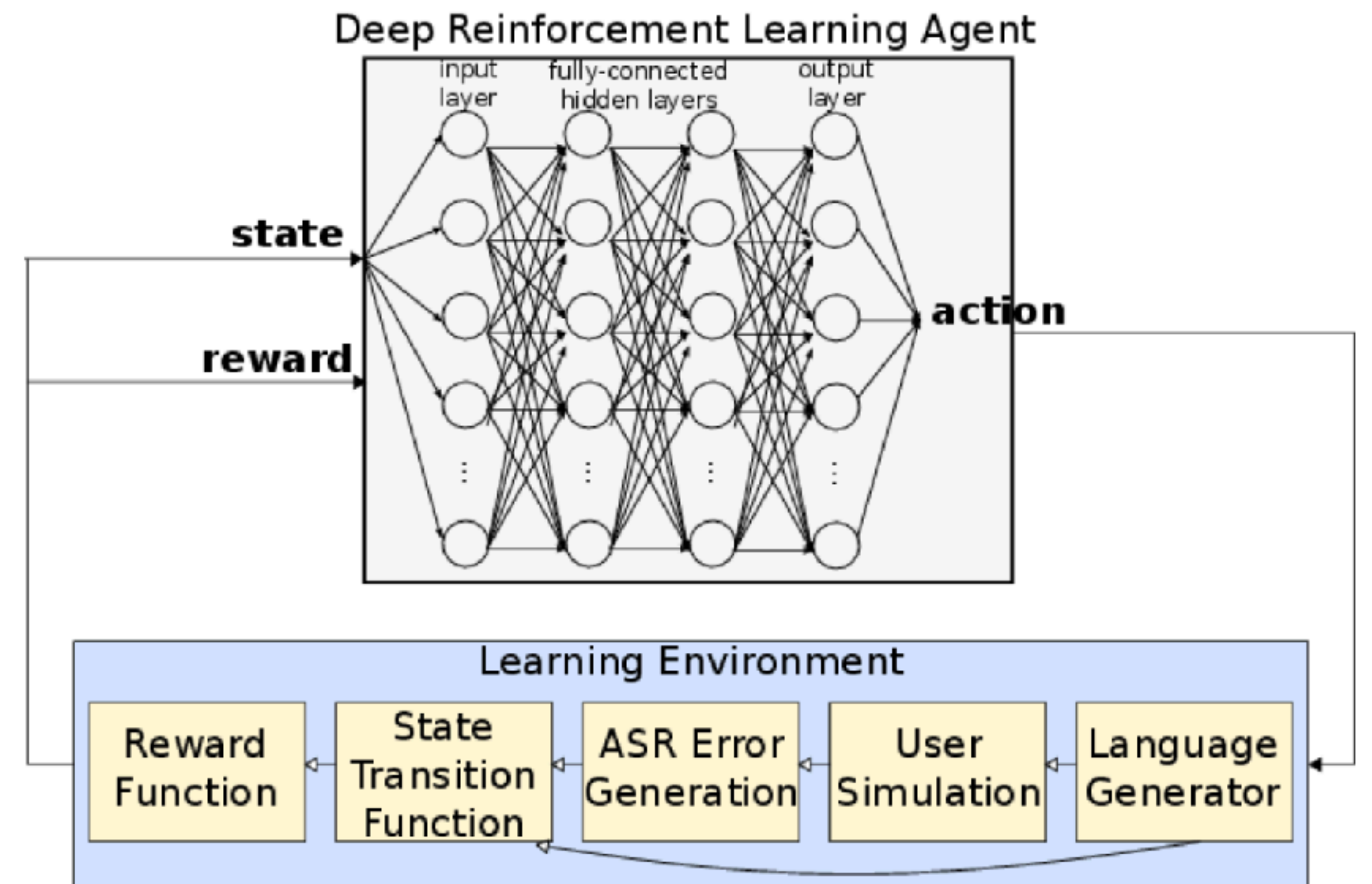
# Introduction to Reinforcement Learning

- Agent and Environment
- Observation and Action
- Reward



# The *SimpleDS* Dialogue System

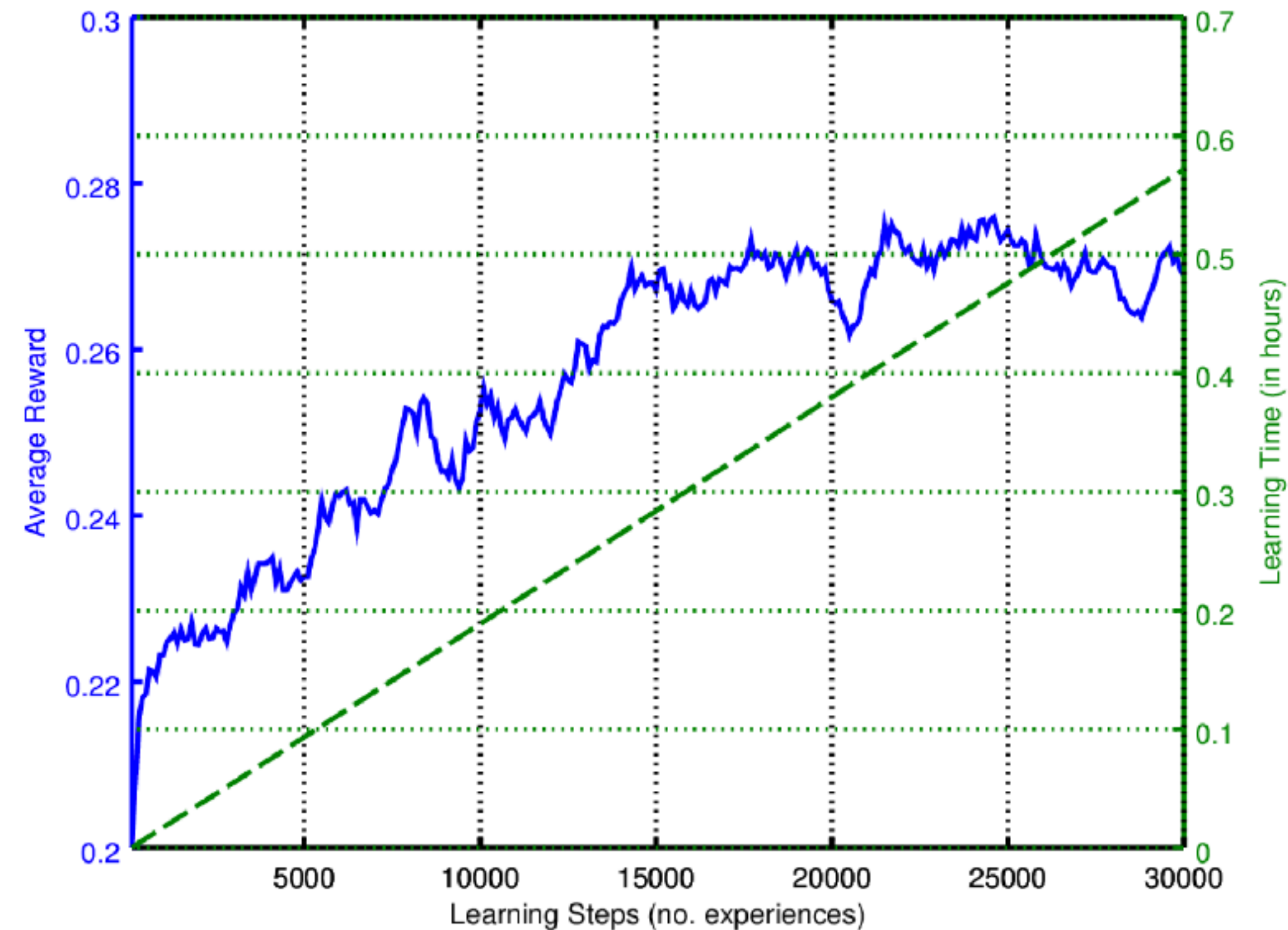
- Diagram of *SimpleDS*
- Learning setup
- Code at GitHub: <https://github.com/cuayahuitl/SimpleDS>



**Fig. 1** High-level architecture of the *SimpleDS* dialogue system—see text for details.



# Results



**Fig. 2** Learning curve of the *SimpleDS* Deep Reinforcement Learning agent—see text for details.

# Summary

- Reinforcement Learning for Dialogue Systems
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[human]: “What do we want?”

[ bot ]: “Chatbots!”

[human]: “When do we want them?”

[ bot ]: “Sorry, I didn’t understand your request.”

**–ChatbotConf 2016**