



# The Malmo Collaborative AI Challenge

Katja Hofmann

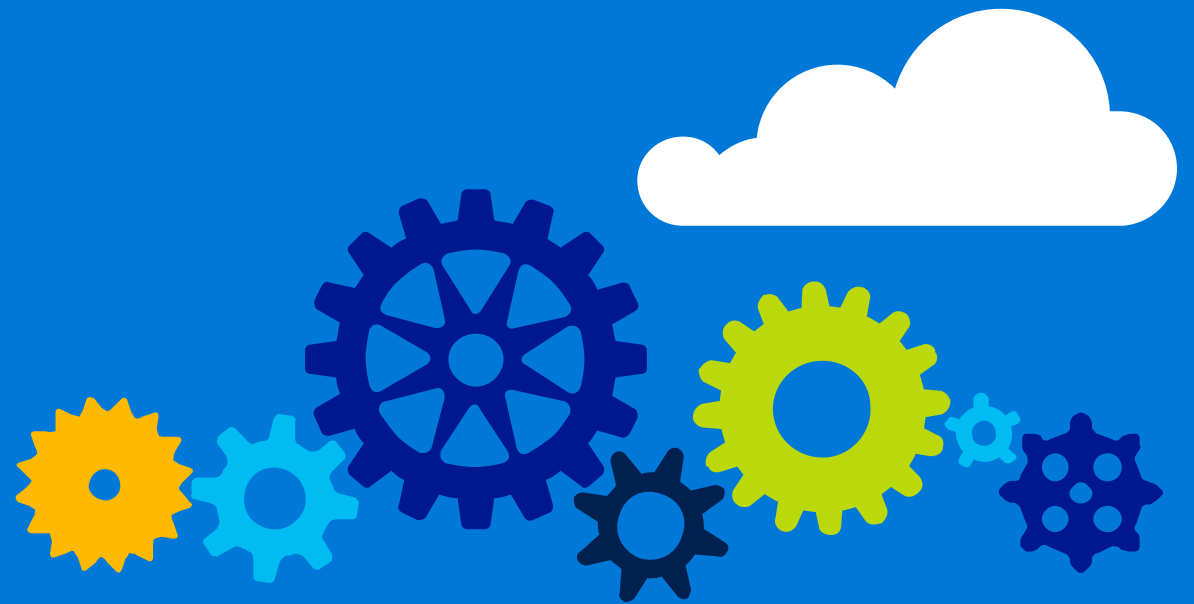
Researcher, MSR Cambridge

Noboru Kuno (Sean)

Research Program Manager

... and the challenge winners

July 6, 2017 – AI Summer School



# Project Malmo

A platform for AI experimentation,  
built on Minecraft

<https://www.microsoft.com/en-us/research/project/project-malmo/>

Open source on Github

<https://github.com/Microsoft/malmo>



Microsoft / **malmo** Unwatch 233 Unstar 1,998 Fork 263

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Project Malmo is a platform for Artificial Intelligence experimentation and research built on top of Minecraft. We aim to inspire a new generation of research into challenging new problems presented by this unique environment. --- For installation instructions, scroll down to \*Getting Started\* below, or visit the project page for more information: <https://www.microsoft.com/en-us/research/project/project-malmo/> — Edit

695 commits 4 branches 10 releases 11 contributors

Branch: master New pull request Create new file Upload files Find file Clone or download

timhutton committed on GitHub Merge pull request #300 from Microsoft/xerxes\_init Latest commit efdc5b4 3 days ago

.travis	Minor: removed comments.	20 days ago
ALE_ROMS	Applied MIT license.	2 months ago
Malmo	Fix: having two agent_host's in the same script causes a crash becaus...	4 days ago
Minecraft	Fix: use and attack in discrete movement were being sent to first pla...	4 days ago
Schemas	Fix: time 0 was invalid yet suggested in the documentation.	4 days ago
cmake	Fix: changes to make Lua work on Fedora 23.	2 months ago
doc	Minor: fixed item numbering.	5 days ago
sample_missions	Making cliff_walking_1.xml use discrete actions.	a month ago

Aim: a stepping stone to  
real-world applications

Artificial intelligence

## Why AI researchers like video games

*Games help them understand reality*



Print edition | Science and technology >

May 13th 2017





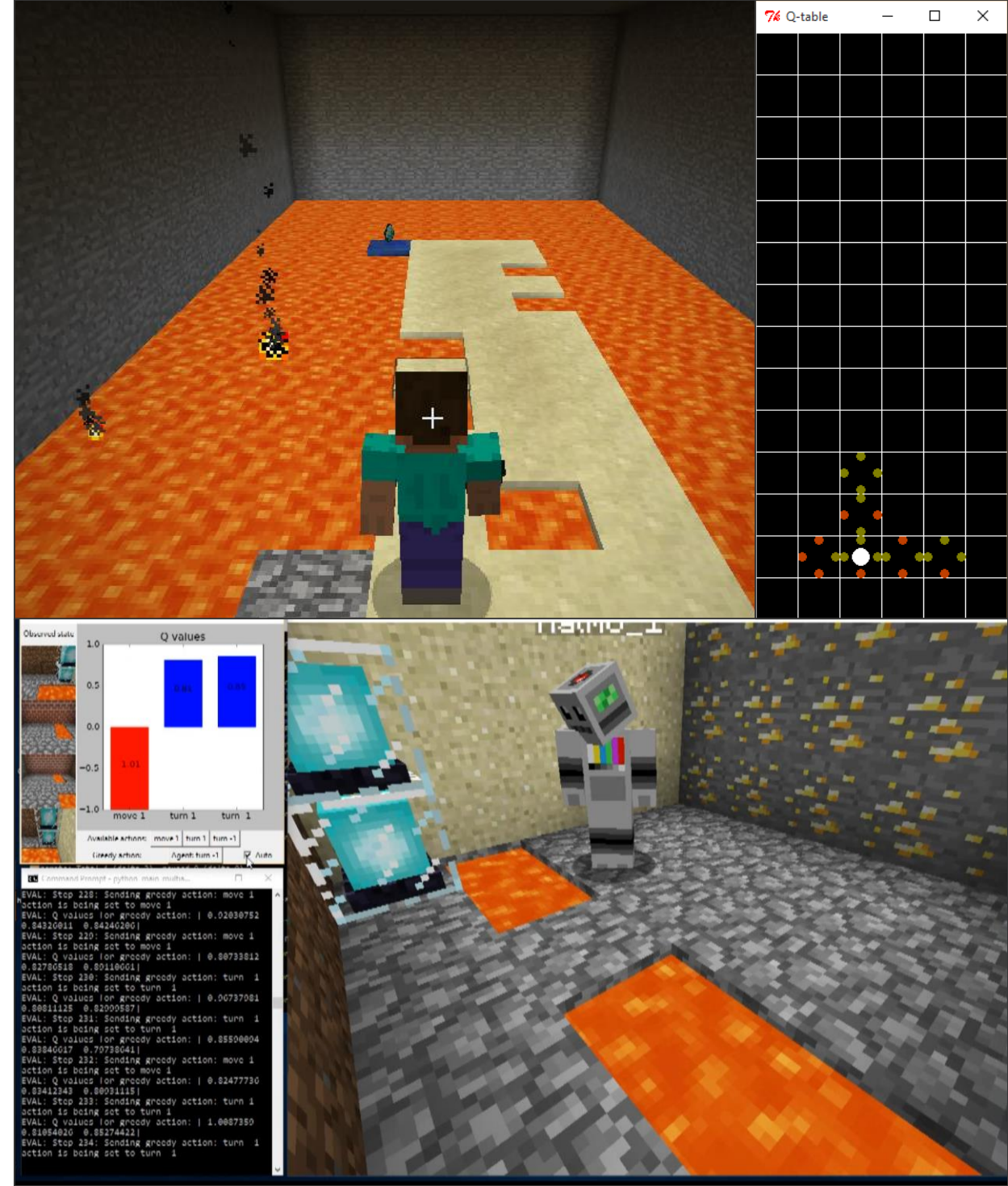
Aim: a stepping stone to  
real-world applications

A rich world with coherent  
physics



# Aim: a stepping stone to real-world applications

## Support a wide range of ideas, approaches and techniques





Aim: a stepping stone to  
real-world applications

A game-world ready for  
collaboration

Received mission:  
Name the first  
item you see.

<Chatty> flower



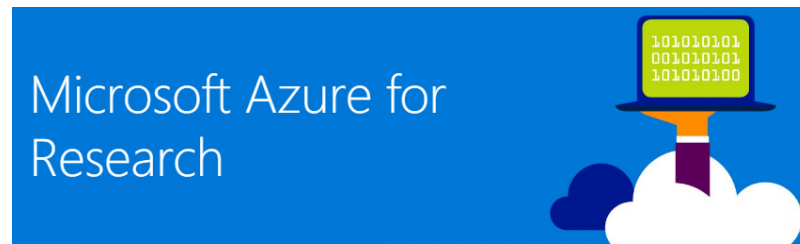
# The Malmo Collaborative AI Challenge



Goal: foster research in  
collaborative AI

April/May 2017: graduate students world-wide participated

Prizes: AI Summer School & Azure for Research grants



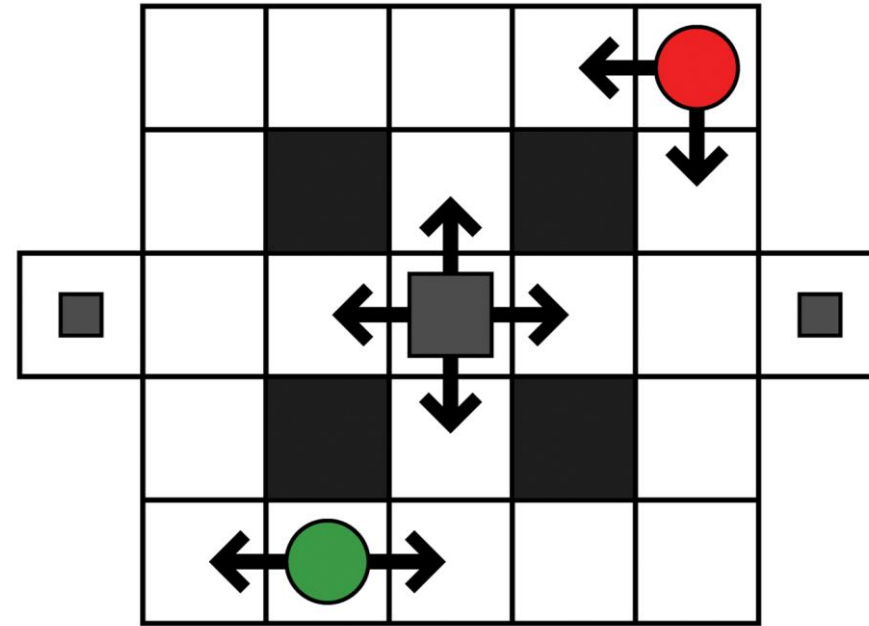
Microsoft Research

**AI Summer  
School 2017**

# Focus: coordination games (with signalling)

	Stag	Hare
Stag	5, 5	0, 1
Hare	1, 0	1, 1

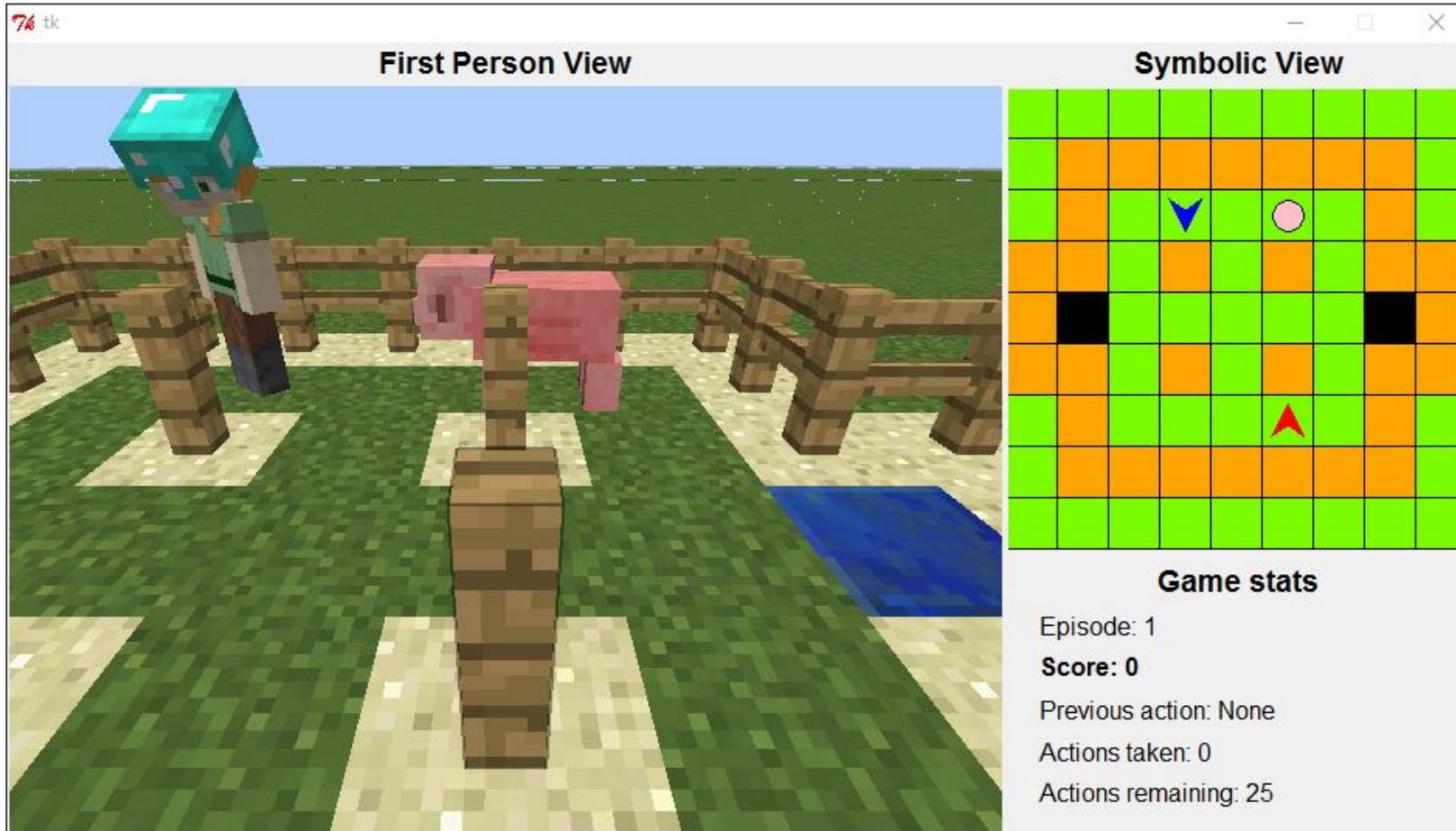
Example payoff matrix for the stag hunt game  
[Rousseau, classic game theory]



Extended stag hunt with signalling  
[Yoshida et al. "Game theory of mind." PLoS computational biology <https://doi.org/10.1371/journal.pcbi.1000254>]



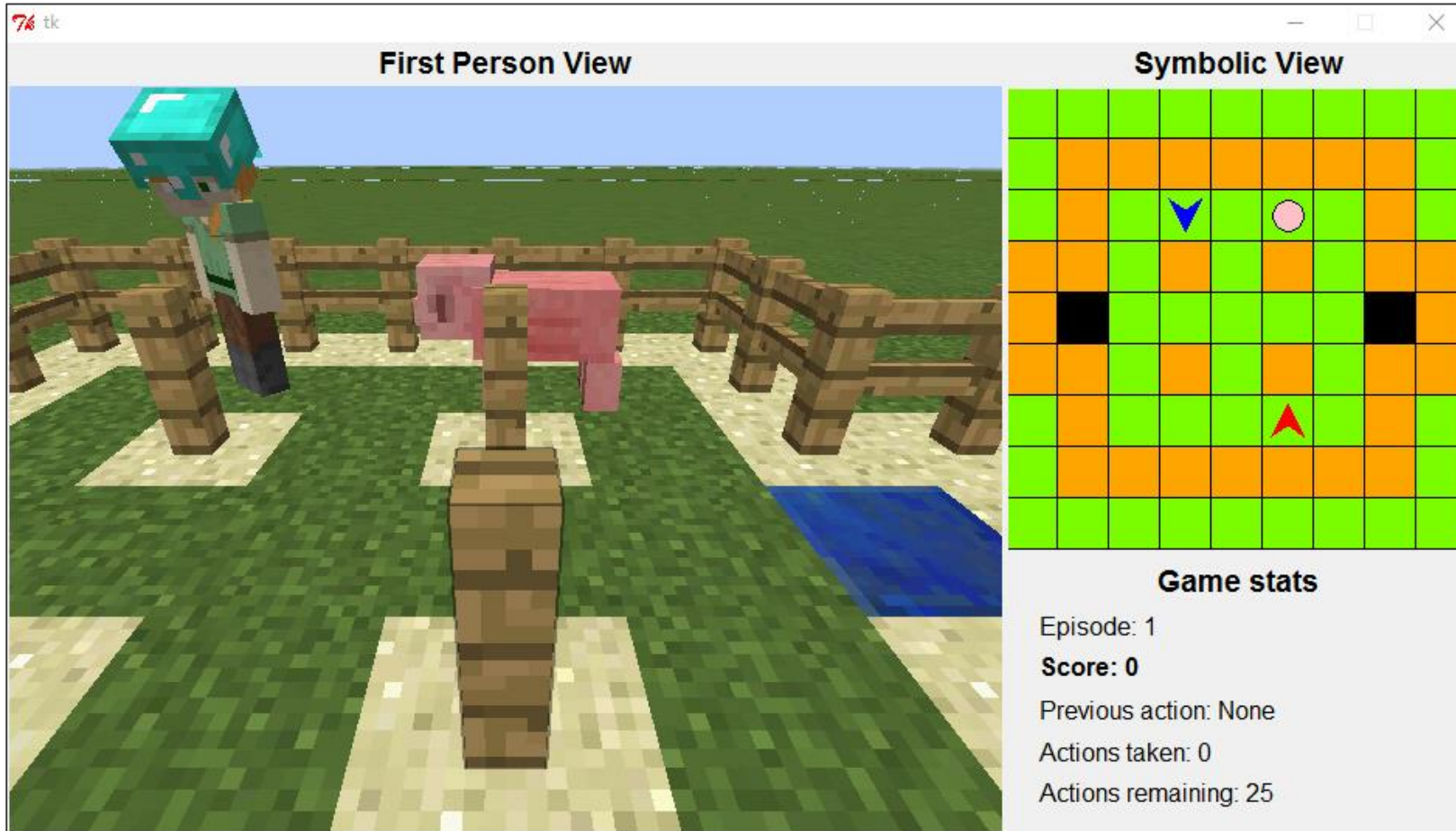
# Challenge Task: Pig Chase



Goal: develop / train an AI agent that adapts to opponent strategy

Screenshot: Human-Agent pig chase game

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Screenshot: Human-Agent pig chase game

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Up next: presentations by the winning teams



# The Future of Collaborative AI



Image credit: Minecraft



