

# Algorithm of Howls02

- エージェントのソースコード及びドキュメントの公開場所

<https://github.com/Alane0307/Howls02>

- エージェントのコンセプト

The idea of our agent is to separate the function of AIWolf into two parts: 1. Strategy; 2. Character prediction.

In order to create satisfactory agent with good performance, for strategy part, we refer to the previous winning agents and adopt multiple strategy for each character.

We modified strategy of SEER, MEDIUM, POSSESSED, VILLAGER, and BODYGUARD.

In order to have satisfactory result, we conducted multiple test running (100 \* 100 sets) with past agents from 1<sup>st</sup> to 4<sup>th</sup> AIWolf International Competition.

After comparing the performance of 15 different agents, we accept various strategy for each character.

- エージェント全体の技術的特徴の解説

As mentioned in the concept part, we adopt multiple strategy for each character. To be more specific, we modified the Karma strategy for SEER, Fanfan strategy for BODYGUARD, Tomato strategy for MEDIUM.

For the VILLAGER, we mainly add new strategy of pretending to be SEER in 15-agent games, the idea is to protect the real SEER in the first or second round.

For the WEREWOLF, we mainly simplify the talk strategy, abandoning the possibility talk selection.

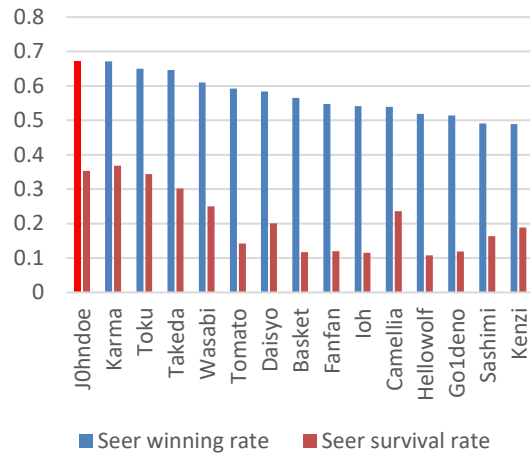
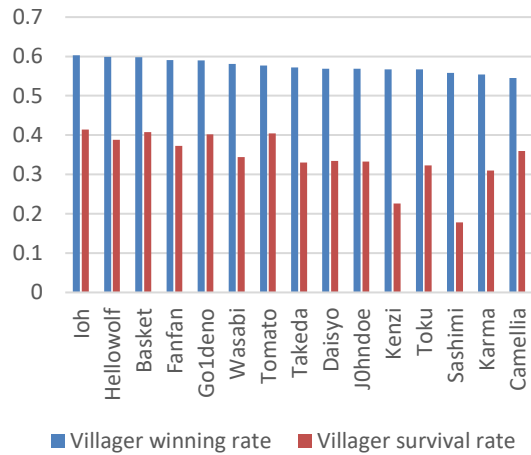
For the POSSESSED, we mainly modify the strategy while pretending to be SEER, but not CO at first round.

Overall, the positive strategy of most Takeda-based teams (e.g. CO at first round) is drastically modified of CO when WEREWOLF is detected or successfully protected, or just keep silent at the 1<sup>st</sup> round.

This negative strategy sets are expected to have better performance in 15-agent games as it adds up to the alive possibility for most characters.

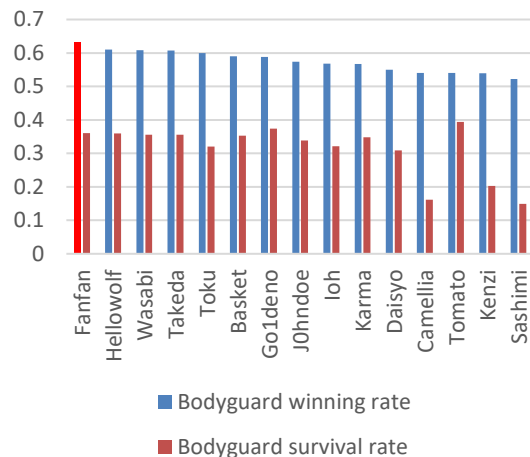
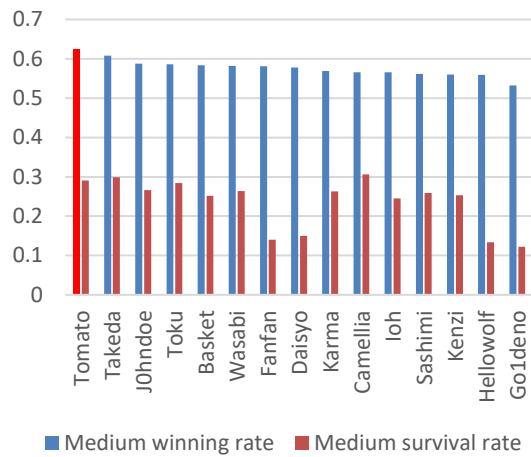
Apart from that, for character prediction, LSTM is applied, trained from test running with previous winning agents from 1<sup>st</sup> to 4<sup>th</sup> International Competition.

- 特徴についての解説



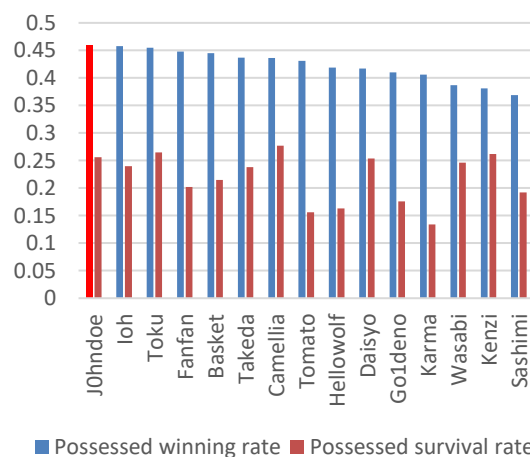
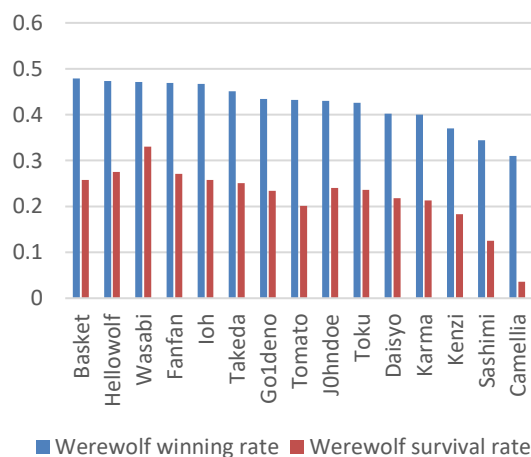
(a) Villager

(b) Seer



(c) Medium

(d) Bodyguard



(e) Werewolf

(f) Possessed

Fig.1 Wining rate & Survival rate of each character (100 \* 100 sets)

As shown in Fig.1, the result of winning rate and survival rate have shown previous agents having different advantages for each character.

After analyzing these agents. we modified the Karma strategy for SEER, Fanfan strategy for

BODYGUARD, Tomato strategy for MEDIUM. For the VILLAGER, we mainly add new strategy of pretending to be SEER in 15-agent games, the idea is to protect the real SEER in the first or second round. For the WEREWOLF, we mainly simplify the talk strategy, abandoning the possibility talk selection. For the POSSESSED, we mainly modify the strategy while pretending to be SEER, but not CO at first round.

More specific modification can be seen from the following figures.

Medium	Basket	Tomato
CO	when black is detected	at first round
Judgement	only the executed	executed + seer
Talk	random talk strategy	must talk

Bodyguard	Basket	Fanfan
CO	when success guarded	no CO
Guard strategy	村人らしさ + 3 * 占い師らしさ + 霊媒師らしさ に勝率を補正して最も高いプレイヤーを選択	<ol style="list-style-type: none"> <li>1. seer</li> <li>2. medium</li> <li>3. villager</li> </ol>
Talk	random talk strategy talk about success guarded agent	vote to wolf

Seer	Basket	Karma
CO	CO at first round CO as werewolf when possessed alive (agents <= 3)	CO at first round CO as werewolf when possessed alive (agents <= 3)
Divine	Divine from 1 to the end	Divine from 1 to the end
Talk	Talk about the divined result when werewolf detected. Probability voting strategy	Talk about the divined result when werewolf detected. Vote to most likely to be werewolf.

Overall, the positive strategy of most Takeda-based teams (e.g. CO at first round) is drastically modified of CO when WEREWOLF is detected or successfully protected, or just keep silent at the 1st round.

#### ・エージェントの今後の課題

Unfortunately, because of the time limitation, the test of newly developed Howls02 agent against past agents from 1<sup>st</sup> to 4<sup>th</sup> competition is not finished.

For the future work, we are planning to conduct multiple test sets (100 \* 100 sets) to clarify the

performance of each character.

Currently, we found our strategy of WEREWOLF needs to be improved as it failed in many 5-agent games competing with Team Basket. Possibly it was because of the simplified talk strategy which we tend to always vote to the most likely to be werewolf agents. This should be verified and modified in the near future.

#### • Reference

[1] <http://aiwolf.org/archives/2840>

[2] <http://aiwolf.org/>

#### Appendix

Test agents taken from previous competition

## 第4回人狼知能国際大会

No.	Name	Source code	Language
1	Basket	○	java
2	ioh	○	java
3	sUper_IL	×	
4	kgu_ryu	×	
5	takoyaki	×	
6	Hachi2	×	
7	KP22	×	
8	ice	×	
9	Ncu702	×	
10	tonkatsu	×	
11	CanisLupus	×	
12	mikami	×	
13	ichida	×	
14	daphne	×	
15	Baguette	△	java

## 第3回人狼知能国際大会

No.	Name	Source code	Language
1	toku/ICE	○	java
2	TOT	○	C#
3	KP22	×	
4	Syu	×	
5	CanisLupus	×	
6	Tomatoken	×	
7	SORA	×	
8	Hideto	×	
9	HALU	○	python
10	Tomato	○	java
11	OKAMI	○	python
12	karma	○	java
13	wasabi	○	java
14	Sashimi	○	java

## 第2回人狼知能国際大会

No.	Name	Source code	Language
1	takeda	○	java
2	otsuki	○	java
3	HALU	○	python
4	JOhnDoe	○	java
5	cube	○	java
6	daisyo	○	java
7	Tomo	○	java
8	simipu	○	java
9	Udon	○	C#
10	Tomato	○	java
11	wasabi	○	java
12	FoxuFoxu	○	python
13	PaSeRi	○	java
14	Camellia	○	java
15	Sashimi	○	java

# 第1回人狼知能国際大会

No.	Name	Source code	Language
1	takeda	○	java
2	hello_wolf	○	java
3	Udon	○	python
4	GO1DeNO	○	java
5	fisherman	○	java
6	fanfan	○	java
7	Tomato	○	java
8	calups	○	python
9	wasabi	○	java
10	kenzi	○	java
11	sonoda	○	python
12	cantar	○	python
13	Ltt1eGirl	○	python
14	takaeye	×	
15	yskn67	○	python