

ANAC 2019 Diplomacy Challenge

Official Results

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August 26, 2019

Goal of the Challenge

The ANAC 2019 Diplomacy Challenge consisted of two rounds. In order to win the Challenge an agent had to outperform the non-negotiating D-Brane in Round 1, as well as beat all the other agents in Round 2.

Backup Rule

In case the above rules did not yield any winner (i.e. if the best agent of Round 2 was not able to outperform D-Brane in Round 1), the so-called *Backup Rule* would come into effect. The Backup Rule states that the agent that made the most proposals that were eventually accepted by the other agents in Round 2 would be declared the winner.

Submissions

We received the following submissions:

- **DipBrain**, by José Aleixo Cruz
University of Porto, Portugal
- **Saitama**, by Ryohei Kawata and Katsuhide Fujita
Tokyo University of Agriculture and Technology, Japan
- **BackstabAgent**, by Adin Epstein, Shay Keynan, Elad Ben Zaken, and Ofri Kleinfeld
Bar Ilan university, Israel
- **Biu3141**, by Yonatan Karni, Ahavatya Revivo, Roi Fogler, Lior Weintraub, and Barak Ganon
Bar Ilan University, Israel

- **Oslo_A**, by Liora Zaidner, Shahar Zadok, Ori Steinberg, Omry Darwish, and Aviram Aviv
Bar Ilan University, Israel

Pre-Tournament

In order to measure the strength of each power, before the start of the tournament we let 7 instances of the non-negotiating D-Brane play 1000 games together and we recorded for each power how many Supply Centers it would conquer on average.

Power	Supply Centers
Russia	10
Turkey	6.0
France	5.0
England	4.8
Germany	3.7
Italy	2.3
Austria	2.2

Table 1: Average number of Supply Centers scored by each power, in games where all players are D-Branes.

Furthermore, we performed a test in which 1 D-Brane (the ‘coalition player’) would be playing 4 powers at the same time, against 3 other instances of D-Brane, each playing just one power. When then compared the score of the coalition power with the score that those 4 powers would have scored if played by individual agents (as in Table 1). If the score of the coalition player was much higher it meant that this coalition strongly benefits from cooperation.

In this way we found the following 6 ‘strong coalitions’:

$\{AUS, ENG, FRA, GER\}$

$\{AUS, ENG, FRA, ITA\}$

$\{AUS, ENG, FRA, TUR\}$

$\{AUS, ENG, GER, ITA\}$

$\{AUS, ENG, GER, TUR\}$

$\{AUS, FRA, GER, ITA\}$

Results Round 1

Each agent played 300 games with 4 instances of itself and 3 instances of the non-negotiating D-Brane agent. In each such game the 4 instances of the participant’s agent were assigned to the four powers of one of the strong coalitions.

We counted the average number of Supply Centers conquered per agent instance per game. We say an agent *passed Round 1* if it scored a higher average than D-Brane, otherwise, we say it *failed*. The score of D-Brane was calculated by taking the scores from Table 1.

	Supply Centers	Result
D-Brane	15.15	
Saitama	14.75	FAIL
Oslo_A	14.62	FAIL
DipBrain	14.56	FAIL
Biu3141	14.48	FAIL
BackstabAgent	14.47	FAIL

Table 2: Results of Round 1. None of the agents outperformed D-Brane

Results Round 2

In Round 2 we played 98 games with 1 instance of each submitted agent together (the number of games had to be a multiple of 7, so that each agent could play each power an equal number of times). Unfortunately, Biu3141 could not participate, because in many rounds it was not able to submit its orders before the deadline. In order to have enough players we supplemented the field with 1 instance of the non-negotiating D-Brane, 1 instance of GamlBot and 1 instance of M@stermind (GamlBot and M@stermind were submissions from previous years).

The results are displayed in Table 3. We see that Oslo_A strongly outperformed all other agents, and was also the only one to beat the non-negotiating D-Brane.

		Average	Standard Error
1	Oslo_A	6.675	0.309
	D-Brane	5.557	0.268
2	DipBrain	5.064	0.243
3	Saitama	4.882	0.231
	GamlBot	4.793	0.214
4	BackstabAgent	4.196	0.246
	M@sterMind	2.832	0.174

Table 3: Results of round 2. Oslo_A outperforms all other agents, and is the only one that outperforms the non-negotiating D-Brane.

Applying the Backup Rule

Since none of the submitted agents was able to pass the first round we had to determine the winner by means of the Backup Rule. The results are displayed in Table 4. We see that Saitama made the most proposals that were accepted, so Saitama was declared the winner of the ANAC 2019 Diplomacy Challenge.

		Accepted Proposals
1.	Saitama	9091
2.	BackstabAgent	6585
3.	Oslo_A	4393
4.	DipBrain	4373

Table 4: The number of proposals proposed by each agent in Round 2 that were eventually accepted by the other agents. We see that Saitama is the winner.

Conclusions

in Round 2 Oslo_A defeated all other agents and was the only agent that managed to defeat D-Brane. However, it was not able to outperform D-Brane in Round 1, so it was not declared the winner.

In order to declare a winner we applied the Backup Rule, which showed that Saitama was the agent that made the most acceptable proposals. Therefore, we conclude that:

The winner of the ANAC 2019 Diplomacy Challenge is SAITAMA, by Ryohei Kawata and Katsuhide Fujita

Furthermore, we have decided that:

An Honorable Mention Award goes to OSLO_A, by Liora Zaidner, Shahar Zadok, Ori Steinberg, Omry Darwish, and Aviram Aviv

for strongly outperforming all other agents in Round 2.