

ANAC 2018 Diplomacy Challenge

Call for Participation

Goal of the Challenge

The goal of this challenge is to implement a negotiation algorithm on top of an existing Diplomacy player. The winner of the challenge will be the algorithm that outperforms all other participants as well as a non-negotiating player.

Since the game of Diplomacy is a very challenging domain, we have decided to have it this year as a 'Challenge' rather than a 'Competition'. This means that we will only award a prize if the winner manages to outperform the non-negotiating agents.

Diplomacy

Diplomacy is a strategy game for 7 players. Each player has a number of armies and fleets positioned on a map of Europe and the goal is to conquer half of the "Supply Centers". In order to play well it is essential that you cooperate and negotiate with other players.

The interesting aspect of Diplomacy as a negotiation domain is that there is no explicit formula to calculate your agent's utility values. Instead, utility is only defined indirectly. The goal of a negotiator is to make deals with its coalition partners that increase its chances of winning. However, since Diplomacy is a complex game over many rounds, there is no straightforward way to calculate your probability of winning. Therefore, your player will need to apply some heuristic approach to estimate the value of a deal.

How to Participate

Entrants to the competition have to develop a negotiation algorithm for the game of Diplomacy. The algorithm must be implemented in Java using the BANDANA framework. This negotiation algorithm will then be combined with an existing non-negotiating agent (the D-Brane strategic module) to form a complete negotiating Diplomacy player.

Participants are **not** allowed to develop a complete Diplomacy player from scratch.

Participants should **only** implement a negotiation algorithm.

Details about how to implement your algorithm can be found in the ANAC Diplomacy Challenge 2018 manual, which can be found on the BANDANA website:

<http://www.iija.csic.es/~davedejonge/bandana/>

Tournament Setup

The Diplomacy Challenge is composed of two rounds.

First round:

In the first round 3 or 4 instances of your agent will be playing a large number of games against 3 or 4 instances of the non-negotiating agent. Your agent passes the first round if it achieves a higher score than the non-negotiating agents. If no participant passes the first round, then the Challenge ends with no winner.

Second round (if there are at least 2 agents that passed the first round):

In the second round all agents that passed the first round will be playing together in a large number of games. In each of these games there will be a maximum of 4 negotiating agents. The other agents will be non-negotiating.

The negotiating agent that scores the highest number of points in this round wins the challenge. If multiple agents score equally, then the results of the first round will be used as a tiebreaker. If we then still have multiple participants with equal score, then the prize will be divided among them.

Second round (if your agent is the only agent that passed the first round):

In this case your agent will also be playing with 3 randomly selected other agents even though they did not pass the first round (if there are not enough submissions then we may use the agents from last year's competition). If none of the other agents achieves a higher score than your agent, then you win the challenge. Otherwise, the challenge ends with no winner.

Statistics:

In the above, the score is always an average over a large number of games. We will play as many games as necessary to obtain statistically significant results. Furthermore, whenever we say "higher score" we mean that the difference in score is statistically significant. Whenever we say "equal score" we mean that the difference in score is so small that it is not statistically significant.

Motivation:

The motivation for this tournament setup is that the first round ensures that the players do not make purely selfish proposals. They have to be able to make proposals that are beneficial to the coalition as a whole. On the other hand, the second round ensures that the agents cannot just accept any random proposal. An agent that accepts anything would be easily exploited by its opponents in the second round. Furthermore, the second round provides your agent the opportunity to try and exploit the other players.

Rules of Encounter

Negotiations take place in every *Spring* phase and every *Fall* phase of the game. The BANDANA framework offers a limited set of deals the players can propose, as explained in the BANDANA manual.

Negotiation Protocol:

Negotiations take place under the *Unstructured Negotiation Protocol*:

- Proposals can involve any number of agents (but at least 1 agent other than the proposer).
- Proposals are private to those players involved in the proposal. Thus, if agent A makes a proposal to agents B and C, then only A, B and C will know about it. Agents D, E, F and G will not know about the proposal.
- Any agent can make or accept any proposal whenever it wants, so there is no 'turn-taking'.
- A neutral 'Notary agent' will record all proposals that are being proposed and accepted.
- The Notary agent sends a confirmation message to all players involved in a proposal if all those players have accepted it, and it is not inconsistent with any earlier confirmed proposals.
- Once a deal has been confirmed by the Notary it is considered a binding agreement. This means your agent will choose its moves according to that agreement. Note that this is different from the normal Diplomacy game in which players may choose to disobey a deal.

At the end of each turn the D-Brane strategic module will select your player's moves. If your player is involved in any deal that has been confirmed then the D-Brane strategic module will only choose moves that obey that agreement.

Other details:

- Each round of the game will last for 30 seconds.
- The 'score' of an agent is simply the number of Supply Centers it conquers.
- A game ends either if any player conquers 18 Supply Centers, or when the players agree to a draw, or if the game reaches the 'winter 1920' phase.
- In each game the agents are randomly assigned to any of the 7 *Great Powers*.

The winner of the challenge (if there is any) is expected to have a representative attending the IJCAI 2018 conference to give a brief presentation describing his or her agent.

Submission:

Submission deadline: May 1, 2018
Notification to winner(s): June 1, 2018
Event: 13-19 July, 2018

More Information

More information about how to implement and submit your negotiation algorithm can be found here:

<http://www.iiia.csic.es/~davedejonge/bandana/>

A short Youtube introduction to Diplomacy:

<https://www.youtube.com/watch?v=z40JP-PJ1vI&feature=youtu.be>

The complete Diplomacy rulebook:

https://www.wizards.com/avalonhill/rules/diplomacy_rulebook.pdf

A platform to play Diplomacy online, including a discussion forum:

<http://www.playdiplomacy.com>