

# ANAC 2019 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 agent.

This league is arguably a bit more challenging than the other ANAC leagues. In the previous years, no participant has yet been able to write an algorithm that managed to significantly outperform the non-negotiating agents, so this is indeed a 'challenge'.

### 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 tactical 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 2019 manual, which can be found on the BANDANA website:

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

If you are interested in participating it is **highly recommended** that you send us an email to express your interest, so that we can keep you updated if there is any important news we want to share with the participants. Please put [ANAC Diplomacy] in the subject, and write something in the email along the lines of "I'm interested in participating in the ANAC 2019 Diplomacy Challenge". Please send it to [davedejonge@iiia.csic.es](mailto:davedejonge@iiia.csic.es).

# Tournament Setup

The Diplomacy Challenge is composed of two rounds.

## Round 1:

In the first round 4 copies of your agent will be playing a large number of games against 3 copies of the non-negotiating agent. Your agent passes the first round if it conquers a higher number of supply centers on average than the non-negotiating agents.

## Round 2:

In the second round all participating agents will be playing together in a large number of games. If the agent that conquers the highest amount of Supply Centers in Round 2 also managed to pass Round 1, then that agent will be declared the overall winner of the Diplomacy Challenge.

Otherwise, we will count, for each player, how many proposals it made in Round 2, which were ultimately confirmed (i.e. accepted by all other agents to which it was proposed). The agent that made the most such proposals will win the Challenge (regardless of whether it passed Round 1 or not).

If we have less than 4 participants, then the field in round 2 will be supplemented with agents from last year and/or non-negotiating agents.

## Statistical Significance:

In the above, whenever we say “higher score” we always mean that the difference in score is large enough to be 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 the following.

The second round is where your player’s real negotiation skills are tested. If your agent only makes purely selfish proposals it will not be successful, because your opponents will not accept those proposals, and if it only makes purely altruistic proposals, or accepts any received proposal, it will not be successful either, because your agent will be exploited by its opponents. Therefore, you need to find the right balance between selfishness and altruism.

The first round, on the other hand, ensures that your agent is not just waiting for the other agents to make good proposals. Since your agent is only playing with copies of itself, you have to make sure that your agent is able to make good proposals.

## 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 20 seconds.
- 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.
- The agents are randomly assigned to the 7 Great Powers, however, if some of the agents are non-negotiating agents, then we make sure the negotiating agents are assigned to powers that cooperate well.

The winner of the challenge is expected to have a representative attending the IJCAI 2019 conference in Macao, China, to give a brief presentation describing his or her agent.

## Submission:

Submission deadline:	20 May 2019, 23:59 UTC-12
Notification to winner(s):	15 June 2019
Event:	IJCAI 2019, Macao, China (10-16 August 2019)

## 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](https://www.wizards.com/avalonhill/rules/diplomacy_rulebook.pdf)

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

<http://www.playdiplomacy.com>