Automated Negotiation League (ANL) 2026: An Overview

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This document provides an overview of the Automated Negotiating Agents Competitions (ANAC) Automated Negotiation League (ANL) 2026. In this document we explain the challenge of this year and the practicalities for participation. For more information, see the submission website.

1 Overview

The Automated Negotiating Agent Competition (ANAC) is an international tournament that has been running since 2010 to bring together researchers from the negotiation community. In the Automated Negotiation League (ANL), participants explore the strategies and difficulties in creating efficient agents whose primary purpose is to negotiate with other agent's strategies. Every year, the league presents a different challenge for the participating agents. This year's challenge is:

Design and build a negotiation agent for bilateral negotiation that tries to mislead its opponent. The agent is rewarded for the agreement made in the negotiation, as well as for how well it is able to deceive its opponent. The challenge is to mislead the opponent, while maximizing reward.

In previous years, ANL focused on different complex negotiation aspects, such as learning from the negotiation history or multilateral agreements. This year, the challenge focuses on deception in a bilateral multi-issue negotiation setting. The agent is rewarded for its individual advantage in the negotiation, but also splits an extra point with the opponent based on who was better able to mislead the other agent, specifically the opponent model of the other agent. Who can build the best deceiving agent that still attains a good negotiation outcome?

ANL 2026 will take place at the IJCAI conference in Bremen, Germany. Winners will be rewarded with funding to join the conference.

2 Motivating example

Consider Anna and Bart, who have a fruit basket with apples, bananas, and cherries. They want to divide these fruits between themselves. Both of them have certain preferences over which fruits they would like to get. Anna prefers cherries over apples over bananas. Bart, on the other hand, likes bananas the best, and cherries the least. They could start an informal negotiation about how to divide the fruits. Anna might propose that she takes the apples and cherries, and that Bart gets the bananas. If Bart thinks this is not fair, he might propose a counteroffer, where he additionally receives half of the apples. If Anna accept this offer, they end up with the following division: Anna takes the cherries, Bart takes the bananas, and they divide the apples equally.

However, imagine Anna already knows Bart's preference for bananas. She could misrepresent her preferences to let Bart believe she also likes bananas the most. If they now negotiate over the division of the fruits, Anna could suggest as a compromise that she takes the apples and cherries,

while Bart takes the most-preferred fruit bananas. From Bart's perspective this seems like a good deal, since he gets the bananas, which he thinks are preferred by both Anna and him. However, Anna actually got her two most preferred fruits by misrepresenting her preferences and deceiving Bart.

This small example shows that misleading your opponent in a negotiation can actually result in a better deal for yourself. How would you deceive the opponent and use this to your advantage?

3 Setup

In the ANL, all submitted agents will participate in a bilateral negotiation tournament. The agents will negotiate against each other using the Alternating Offers Protocol (AOP). Here, the starting agent makes an opening offer, which is followed by acceptance, a counteroffer, or a walk-away. Then the process is repeated. If the agents reach an agreement together before the deadline, each agent gets a score based on this outcome. If no agreement is reached, each agent obtains the reservation value, which can differ per agent. Moreover, the agents divide a point based on who was better at misleading the other during the negotiation.

The agents negotiate over a multi-issue domain. The agent has access to its own utility function and reservation value, but the utility function and the reservation value of the opponent is unknown.

4 Practicalities

When? The deadline for submitting your agent is June 1, 2026.

What? Participants submit their agent code and (optional) academic report to the submission portal. Specifics on the content can be read in the next sections.

Why? It is fun! And you can help the negotiation community further in research. Also, the winners may join the IJCAI conference in Bremen, Germany (15th to 21st August, 2026) and possibly give a brief presentation there.

Where? The ANL will use the platform NegMAS. NegMAS supports submission in Python. You can find instructions on how to start your ANL agent in the next sections and in the tutorials. Further tutorials on designing your agent for ANL can be found on the general NegMAS documentation website: specifically the tutorials Running a Negotiation, and Develop a new negotiator may be useful.

What next? The next step is registration on the submission portal. Then you can read the rest of this document and continue to the tutorials.

Further details

So far you have read everything you need to decide whether to join the competition! The rest of this document contains further information on the used protocol and evaluation method, and closes off with some practical information on how to submit and what rules to follow.

5 Detailed Setup

In the ANL, all submitted agents will participate in a bilateral negotiation tournament. In every negotiation between two agents, the agents negotiate over a multi-issue domain, where they try to obtain a single deal. Every agent has a utility function, which indicates how good an outcome is for the agent, and a reservation value, which can be thought of as the utility of reaching no agreement. The agents in the negotiation get scored on the outcome of the negotiation as well as their deception: more details in Section 6.

5.1 Protocol

In the ANL each negotiation follows the Alternating Offers Protocol. Here, the starting agent makes an opening offer, which is followed by the other agent performing on of these three actions:

- Accept the offer of the opponent agent.
- Make a counteroffer (thus rejecting and overriding the previous offer).
- Walk away (i.e., end the negotiation without any agreement).

This process is repeated in a turn-taking fashion until an agreement is reached or the deadline has passed. The deadline in this year's ANL is fixed to a known number of rounds.

6 Evaluation

Agents are scored based on the outcome obtained in the negotiation as well as on how well they were able to mislead their opponent. The first part of the agent's score is the obtained (normalized) advantage, which is the utility of the obtained outcome minus the reservation value.

The second part of the agent's score is based on the misleading of the opponent. Note that if an agent is able to mislead their opponent well, then the estimate the opponent makes of the agent's utility function will be worse. So the score for misleading is based on the distance between the actual and the estimated utility function of an agent. This distance is computed as the Kendall rank correlation coefficient (specifically the Tau-b statistic) and then normalized to lie between 0 and 1. If this normalized distance is close to 1, respectively 0, then the agent had a good, respectively bad, estimate of the utility function.

The extra point for misleading is divided according to this distance between the actual and estimated opponent's utility function. If an agent is better at misleading than their opponent, then the agent should obtain a higher distance between the opponent's actual utility function and the agent's estimate, which results in a bigger part of the extra point for misleading.

Consider a negotiation between agents A and B with respective utility functions u_A, u_B and respective reservation values r_A, r_B. Let o denote the outcome of the negotiation and let $\hat{u_B}, \hat{u_A}$ denote agent A's, respectively agent B's, estimate of the opponent's utility function. Let d denote the Kendall rank correlation coefficient. Then the agents are scored as follows. The advantage of agent A is $\text{adv}_A = (u_A(o) - r_A) / (\max(u_A) - r_A)$, and similarly for agent B. The normalized Kendall rank correlation coefficients are computed as $\tau(A) = \frac{1}{2}(1 + d(\hat{u_B}, u_B))$ and $\tau(B) = \frac{1}{2}(1 +$

$d(\hat{u_A}, u_A)$) for agent A, respectively B. The final score of agent A, respectively B is

$$\text{adv}_A + \frac{\tau(A)}{\tau(A)+\tau(B)}, \quad \text{adv}_B + \frac{\tau(B)}{\tau(A)+\tau(B)}.$$

Caveat: if $\tau(A)+\tau(B) = 0$, then both agent A and B get no part of the extra point for misleading. Moreover, if an agent does not have an opponent model implemented or the opponent model does not produce an estimate for the utility function, this agent always gets no part of the extra point for misleading (by setting $\tau = 0$).

7 Rules of Participation

- Agents need to follow the AOP protocol in a negotiation.
- Opponents are encountered multiple times, but it is strictly **not** allowed to save any information in memory or on HDD between different negotiations (e.g., no change of global or class-level variables).
- Violating the spirit of fair play, e.g., exploiting bugs in the code, will result in disqualification. The ANAC board will be the judge in these matters.
- The competition rules allow multiple entries from a single institution but require each agent to be developed independently.
- No participant can be a co-author of more than three agents.
- The source code of agents must be submitted. This code will be included in the ANL package for future use after the competition is finished.

8 Submissions

Participants submit their agent source code and academic report (optionally) to this submission portal. The deadline for submitting your agent is **June 1, 2026, 23:59 AoE**.

Academic report

Each participant should prepare a 2-4 page report describing the design of their agent according to academic standards. The best teams can give a brief presentation describing their agent depending on the available slots at IJCAI 2026.

As guidelines, the report should address the following aspects:

- Deceptive Bidding Strategy: How the agent generates bids each turn and how these bids are used to mislead the opponent.
- Opponent Modeling: How the agent estimates the opponent's utility function.
- Acceptance Strategy: How the agent accepts or rejects a bid.

9 Getting Started

This year, the ANL will use the platform NegMAS. NegMAS supports submissions in Python. To participate in the competition, follow the following steps:

1. Start by reading the Call For Participation.
2. Register on the submission website to receive notifications and submit your agent. After registration, you can log in anytime to submit your agent.

3. Download the submission template including example agents from the the submission website.
4. Develop and submit your agent following the tutorial. You can submit your agent **as many times as you want**. Submit early to get feedback and be included in the online Leaderboard.
5. The tutorial covers everything you need to start developing your agent. For more information about NegMAS, refer to the full documentation and the tutorials (especially Running a Negotiation, and Develop a new negotiator may be useful).

Good luck!