!!! The ranking system is subject to change and refinement!!!

Follow the rules for every scenario conscientiously.

Please, read the concept & rules paper carefully.

From the control station, you will not be able to see the entire operational area.

There will be only one operator allowed at the control station.

The operator must not leave the control station during the trial.

There will be no communication between the operator and other people e.g. team members during trial.

If a participant has to abort the trial because of technical difficulties, the chief judge team may allow repeating the trial, if an empty start slot is available.

Trial runs will be terminated when a competitor is unable to complete it within the time allowed.

The ranking system is generally organised in three hierarchical factors:

1. First ranking factor

    For all scenarios, the first and foremost ranking factor will be autonomy. Though this may lead to a discussion about our philosophy, we have decided to judge "autonomy" in the following way:

    We will measure the time you interact with the system (vehicle and/or operator console) (IAT)[1]. You will achieve a higher degree of autonomy by minimising the quotient formed from the IAT divided by the time you need to complete the scenario (RT)[2].

    The minimum achieved IAT quotient of all contestants (MR) will be divided by your result, so that you can achieve a result between 0 and 1:

    Ranking factor #1 = MR / (IAT/RT)

2. Second ranking factor

    For every scenario, the result is determined as follows: your result (YR) is divided by the highest result (HR) of all contestants, so that you can achieve a result between 0 and 1:

    Ranking factor #2 = YR / HR.

    Moreover, the second factor is especially designed for the different scenarios:

    a) Reconnaissance scenarios day/ night:

    Your result will be the number of "objects / threats" detected correctly, including their positions in UTM coordinates (minimum accuracy of 5m per position) with a minimum of false reports. Best quotes for the highest number of detectable objects / threats incl. UTM positions)

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[1] An interaction starts at the moment when someone interacts with the vehicle and/ or the operator console (or any other device that interoperates with the control station and/ or the vehicle) and ends in the moment when this interaction is finished.
Example: You touch the operator console to enter another GPS waypoint or you watch a video stream e.g. to detect objects or steer the vehicle manually. If you remote control the vehicle over the complete time of the trial, you will have an IAT that is identical to your running time (RT).

[2] RT: Running Time - The time from leaving the start chute to arriving at the finish line (the maximum time is the time allowed for this scenario).

b) Surveillance or Camp Security scenario:
Here, we count the number of "intruders" that you hunt down and identify correctly, including their positions in UTM coordinates (minimum accuracy of 5m per position) with a minimum of false reports.

c) Convoy or Autonomous Navigation scenario:
The average speed you reach on the track is your result for ranking factor #2. Of course, quicker is better!

d) Mule scenario:
Shuttle as often as possible between the two locations. We will count the number of correct changes/turns you make.

For civil ELROB only: For the scenarios c) and d) we would like to encourage you to also detect the "objects / threats" along the route.

3. Third ranking factor
We will calculate the result in this way: the lowest result (MR) of all contestants will be divided by your result, so that you can achieve a result between 0 and 1:
Ranking factor #3 = MR / YR.
Again, the third factor is especially designed for the different scenarios:

a) Reconnaissance scenarios day/ night:
Your result is the time from leaving the start chute to arriving at the finish line or delivering the requested data (RT). The clock keeps running until you handover the USB flash drive!

b) Surveillance or Camp Security scenario:
We will calculate the average time you need for the first detection of each object / threat or intruder.

c) Movements or Autonomous Navigation scenario:
We will take the time you need to pass by a specific (!) obstacle.

d) Mule scenario:
You have to minimize the distance, travelled on each round trip. Therefore, we will measure the quotient of all driven kilometres, divided by your number of round trips, you make.
(Beside the fact, that you have to alternate between the two locations as often as possible, you should find the shortest route.)

Your position in the ranking list will be calculated by the following score formula:
(A, B and C are factors: $A \geq B \geq C$!)

Score formula = ranking factor #1 x A +
ranking factor #2 x B +
ranking factor #3 x C

1. Obviously, a higher score is better!
2. As you may have recognised autonomy is essential!

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Objects and/or Intruders are identified through threads. Correctly detect threads <u>including their positions</u> in UTM coordinates (minimum accuracy of 5m per position) with a minimum of false reports.

There are bonus points for:

a) providing a digital map which includes a plot of the driven track and the position of the detected thread
    1 point for the complete plot of the track (maximum of bonus points == 1)
    1 point for each correct position of an thread in the map (maximum of bonus points == number of detectable thread)

b) digital pictures of the correct detected threads in a quality that allows an easy identification of the thread
    1 point for each correct and identified thread (maximum of bonus points == number of detectable threads)

The bonus points might make the difference if the main score is equal between two participants.

Please be sportsmanlike and play fair!
If there are weaknesses in this ranking system, feel free to tell us.
If the jury gets the impression that someone is trying to cheat, trick or outsmart anybody, it will take appropriate action.