



droniada

RULES OF THE DRONIADA TECHNOLOGY COMPETITION

Mikromakro Institute Foundation
Muchowiec Airport, Katowice, GZM Metropolis, Poland
June 25- June 30

Version 1.0

JANUARY 2022

NOTE

Here is the current version of the Droniada technology competition rules available at www.5zywiolow.pl, whose alias is Droniada.eu. Registered teams will also be notified of changes via email and via the competition profile @Droniadacc.

Incidentally, we use the terms BSP (unmanned aerial vehicle), UAS (unmanned aerial system) and, above all, drone interchangeably, treating this as a *signum temporis* with the latter term in mind.

In all competitions, priority is given to the safety of participants (teams) and spectators (i.e. observers). They are obliged to strictly observe these regulations, including the instructions of the Organisers and the Flight Director appointed by them.

The organizers trust that the competitors will behave according to the rules of fair play, in the spirit of sports competition, taking care of the safety of all participants. However, in the event that a competitor notoriously violates the rules, especially safety rules, the organisers and judges appointed by them have the right to disqualify the participant or team and order them to leave the competition area immediately. Observers are subject to the same rigour. The disqualification shall apply within the competition or the entire competition.

The competition is not subject to the requirements of the Act of 20 March 2009 on safety of mass events due to the planned number of participants and limited access of the Silesian Aero-club to the public. However, the organisers declare that in organising the competition they will use the provisions of the Act to increase safety. This also applies to any orders related to the epidemic situation in the country.

The organisers encourage readers of this document to let them know if they encounter logical inconsistencies, errors or gaps in the rules.

MISSION

THE AIM OF DRONIADA IS TO PREPARE
INNOVATORS TO WORK WITH THE TECHNOLOGIES OF INDUSTRY 4.0.
AT THE SAME TIME, IT IS A TRAINING ON HOW TO RUN YOUR OWN BUSINESS,
BUILD A TEAM AND DEVELOP "SOFT" AND "HARD" COMPETENCIES.

PARTICIPATION IN THE DRONIADA IS A "BATTLE TEST", A CASTING AND GUILD MASTERSTROKE
THAT ALLOWS ENTREPRENEURS AND PUBLIC INSTITUTIONS TO SELECT
CAPABLE EMPLOYEES AND BUSINESS PARTNERS.

BUT AT THE SAME TIME, THE COMPETITION MAKES IT POSSIBLE TO TEST
THE POSSIBILITIES OF TECHNOLOGY INDUSTRY 4.0. TECHNOLOGIES,
ESPECIALLY IN THE FIELDS OF ENVIRONMENTAL PROTECTION, CONSTRUCTION,
PRECISION AGRICULTURE, CRISIS MANAGEMENT AND PUBLIC SAFETY.

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1. General principles

Since 2014, Droniada has allowed you to showcase your competences in Industry 4.0 technologies, with a focus on drones, ICT and information analysis systems. We create a community to popularise the achievements of digital transformation and Industry 4.0.

1. The underlying technology is remote sensing in competitions related to leading sectors: smart agriculture (precision farming), environmental protection, construction and emergency management. In addition, we promote machine learning, internet of things and cloud computing.
2. We prototype solutions that can be applied in the economy.
3. We popularise robotics in agriculture, environmental protection, construction and emergency management.
4. We are stimulating the digital economy by showcasing drones as elements of complex Internet of Things (IoT) systems.
5. We promote information fusion in terms of combining satellite imagery with drone data and other data sources
6. We are developing the workforce of Industry 4.0.
7. We focus on mutual inspiration with ideas for technological solutions.

The competition is open to academic teams, open and individual participants who can combine knowledge from robotics, ICT, geoinformatics, electronics and aviation. We test the competences of Industry 4.0 personnel in a sporting competition, learn about different ways of solving the problems posed and evaluate the capabilities of unmanned systems in delivering real value to the end user.

This year's competition is organised in the formula of a multidisciplinary sports competition. The Olympic Games bring together athletes who specialise in, for example, backstroke swimming, archery or cross-country running. Only a few compete in the modern pentathlon or the athletic decathlon. What unites them is the spirit of sporting struggle and national medal classification. With this in mind - after eight years of organising drone triathlons - we decided it was time to change the formula.

We announce a call for volunteers to take part in five competitions aimed at practical demonstration of the capabilities of autonomous systems, of which only one - the Unmanned Aircraft System Demo - will be obligatory for all. In the general classification we will include the results of the teams just like the countries in the Olympics.

Participants compete for honorary prizes, in-kind prizes, paid internships, but also for cash prizes, which we assign to individual competitions. In 2021, the prize pool amounted to 50 thousand zlotys, or approximately 11 thousand euros. The condition for receiving financial prizes is to obtain at least 60% of points, i.e. 6/10 points in the "BSP System Demo" competition, 60/100 points in "Relay", 30/50 points in "Tree of Life", 21/35 points in "Intruder" and respectively 33 /55 points or 39/65 points in "Construction".

1.1 Organisers, partners and judges

The main Organiser is:

Fundacja "Instytut Mikromakro" ("Mikromakro Institute") with its registered seat in Warsaw (address: Al. Komisji Edukacji Narodowej 36/112b, 02-797 Warsaw), entered into the register of associations, other social and professional organisations, foundations and independent public health care units and the register of entrepreneurs of the National Court Register kept by the District Court for the Capital City of Warsaw in Warsaw, XIII Economic Division of the National Court Register, under KRS number 0000337473, NIP 9512293688, REGON 142025412, hereinafter referred to as the "Organiser" or "FIM".

The Mikromakro Institute Foundation is setting up the Droniada Organizing Office and Droniada TV to handle the competition. The list of honorary patrons, partners and co-organizers is successively published on the Droniada.eu website.

The Main Organiser, co-organisers and partners form the Organising Committee to which they also invite people connected with the drone market and Industry 4.0. The Chairman of the Organising Committee is Sławomir Kosieliński. The full composition of the Committee is published on the Droniada.eu website.

The Referee Commission is composed of:

- Mariusz Sumara, Tomkov Group,
Chairman of the Referee Commission
- Ryszard Królikowski,
Mikromakro Institute Foundation
Vice-President
- Grzegorz Bilski, DronLab sp. z o.o.
flight directors
(competitions "Relay", "Tree of Life")
- Karol Juszczyk, Vice-President of the
Management Board of the Mikromakro
Institute Foundation;
technical judge
- Wojciech Gruźliński, AeroMind sp. z o.o.
flight director
(competitions "Intruder", "Construction")
- Maciej Zawistowski, expert of the Centre
for Drones - Centre for Unmanned
Systems CNBOP-PIB,
secretary of the Judging Panel

Contact details:

The Mikromakro Institute Foundation, Al. Komisji Edukacji Narodowej 36/112b, 02-797 Warsaw, Sławomir Kosieliński, President of the Board, tel. +48828727514, kosiel@mikromakro.pl. www: 5zywiolow.pl & Droniada.eu. FB: @Droniadacc.

1.2 Date and place

"System demo" consists in the preparation of a 3-5 minute film presenting the participant/team and their idea of competing in selected competitions. We are waiting for the films till 18th June. On Saturday, June 25, teams arrive in Katowice. They register for the second part of the competition "Demo system" - equipment review and checking pilots' qualifications. After that - depending on the choice of competition - qualification begins, especially for the "Relay". On the next day there are trainings in the remaining competitions and the main "Relay" competition.

On Monday 27 June and Tuesday 28 June we will conduct the remaining field competitions and workshops. On Wednesday 29 June the winners in the individual competitions will take part in the Show of Champions. This will be followed by an awards ceremony around 1pm - 3pm (date depends on how the competition goes and weather conditions).

Starters apply as participants through the application form on the website Droniada.eu (the leader fills in the application on behalf of team members, his/her data are at the beginning) indicating in which competitions he/she intends to take part, while everyone else (e.g. organizing committee, judges, speakers, listeners) as observers. A team may consist of a total of 8 persons

1.3 Place of competition

Field competitions, depending on the task, are held in the green area of Muchowiec Airport, not crossing the concrete runway. In the "Relay" competition in its main contest drones fly out of the airport over Katowice Forest Park.

Immediately at the starting point there may be a team in the order drawn, the Jury and the Organising Committee with their guests. Another team is ready to start so that it can replace the current team in case of unforeseen difficulties. The rest of the team stays in the designated spectator area appropriate to the competition.

The announcement of the competition results and the presentation of prizes will take place on Wednesday 29 June 2022 after the preparation of the minutes of the individual competitions.

1.4 Teams

The Droniada is open to participation:

- a) academic teams from student scientific circles and those associated with universities, which may include students, doctoral students, university staff; different teams from the same university are allowed to take part;
- b) inter-university alliances;
- c) Grassroots initiatives within the teams built for Droniada as a leaven for possible future startups, i.e. open teams not related to universities;
- d) individuals.

The leader, like the captain of the national team at the Olympic Games, chooses which competitions he and his team will take part in. He can select a different team for each competition or all of them together, bearing in mind that the whole team consists of a maximum of eight people. Others not taking part in the competition support their colleagues from the audience.

Teams can use the support of coaches/mentors indicated by the Organiser or chosen by themselves, both in terms of organisational, hardware or programming assistance.

Cash prizes will go to the account of the university or non-governmental organisation sponsoring the team, or to the account of the business entity or individual in the case of open teams. The honorary prizes go to the participants themselves. Prize winners are required to pay the appropriate tax on the prizes.

Thus, participants who meet the following conditions together may enter the competition:

- a) They will register by February 28 via the registration form on the Droniada.eu website.
- b) Pay the entry fee in the amount of PLN 1230 gross (23% VAT; PLN 1000 net) by May30 to the Organiser's bank account: 2022

Fundacja Instytut Mikromakro, Al. Komisji Edukacji Narodowej 36 lok. 112B, 02-797 Warszawa
NIP 9512293688; Bank PEKAO SA VIII O/Warszawa ul. Wołoska 18, account no.
361240111211001027439367 Title: Droniada entry fee. Team name, organisation.

- c) By May23 they will present to the Chairman of the Organising Committee and the Technical Judge how they are going to perform the selected tasks in written form or in any other form approved by them - the idea is to present initial concepts and assumptions for the completion of the tasks so that the Organiser can assess the risks and chances for the correct execution of the mission by the team2022. Until June18, the participants are required to send a 3-5 minute film about themselves and their idea for the start-up.

This is the first part of the "BSP System Demo" competition. The organisers reserve the right to select some fragments of the films and edit their own material promoting the start in the competition.

- d) They will indicate by June 18 who will be a drone pilot within the meaning of Implementing Regulation (EU) 2019/947 of 24.05.2019 on rules and procedures for the operation of unmanned aerial vehicles (hereinafter: Implementing Regulation).
We require:
- specifying the operator's number in the register of operators
 - entering the pilot number in the pilot register
 - a declaration that either the pilot has obtained a UAV pilot certificate of competency in general category A2 or that the BSP pilot has passed the drone pilot examination in the specific category for any National Standard Scenario NSTS.
- e) Before starting, the pilot must show a valid civil liability insurance for the user of aircraft with a maximum take-off weight (MTOM) of up to 25 kg, covering damage to property and person. Organizer also suggests additional purchase of aircraft insurance against damage (Aerocasco), because the organizers are not responsible for equipment failure and possible damage during the competition and the consequences thereof.
- f) Participants are required to provide the Technical Judge at kjuszczyk112@gmail.com with logs of their flight in text form within 30 minutes of the end of the competition to confirm that the flights took place in the designated area and at the established ceilings.
- g) The drone operator is required to report the mission to the PansaUTM system using the Droneradar application before each launch.
- h) The drone must meet the requirements indicated below:
- i. placing a plaque on the surface of the unmanned aerial vehicle (UAS) containing the name of the entity operating the UAS and contact details; according to the geographical zone regulations, the operator is the Mikromakro Institute Foundation, the main organiser. The team will receive the placard on site.
 - ii. in the case of an unmanned aerial vehicle which is a multicopter vehicle, a helicopter or an aerostat, a white flashing light mounted on the upper surface of the fuselage in such a way as to emit light omnidirectionally;
 - iii. will be a drone equipped with devices or systems mounted on its flight deck or ground equipment to enable:
 - maintenance of the assumed flight parameters,
 - Ongoing monitoring of flight parameters, including determination:
 - flight path,
 - flight speeds,
 - flight altitude by means of a barometric altimeter,
 - the degree of charge of the supply batteries or the degree of fuel consumption,
 - the quality and strength of the communication signal between the unmanned aircraft and the remote control station,
 - iv. primary location - determination of the current position, velocity, altitude and heading of the unmanned aircraft for transmission to the air traffic service provider via the data communication system or by telephone on request of the ATS unit;
 - v. emergency location - determination by the operator of the current position of an unmanned aircraft in case of irretrievable loss of control of the aircraft or interruption of communication between the remote control station of the unmanned aircraft and the aircraft;
 - vi. automatic execution of the emergency procedure, including:
 - terminate the flight by an emergency landing, or
 - continuing the flight along a pre-programmed route, or
 - arrival at the pre-flight programmed location,
 - vii. the drone will record flight parameters from the moment the unmanned aircraft control system is activated until the moment it is deactivated;

- i) Teams must accept these regulations in order to enter the competition.

Relevant information

- In the competition, points are given for individual, partial solutions and the success of the mission does not depend on their correct execution, although at least 60% of the points must be obtained to win cash prizes in selected competitions.
- It is an absolute requirement to participate in the Droniada, especially in the "Relay" competition, to carry out a risk analysis in accordance with the SORA methodology, the results of which the teams shall submit to the Jury by 23 June.
- UAS up to 25 kg MTOM are programmed according to the competition.
- We will send practice geometric figures to the address given by the participant in the Tree of Life competition between March 5 and May 20.
- Landings will be simple 2x2 metre helipads/banners without radio equipment, but 75 cm diameter circles may also be permitted.
- The competition area is to be the Muchowiec Airport in Katowice, GZM Metropolis.
- Automatic flights are the only means of conducting missions. If the conditions force the operators to take the controls during, they will immediately report this to the judges. This marks the end of the mission. For airframes, manual take-off and landing is allowed.
- All missions will be performed by the participants individually. The Organiser agrees that more than 1 machine may be used by participants provided that adequate horizontal and vertical separation is maintained as approved by the technical judge.

1.5 Equipment

The organisers are focused on popularising the safe use of drones in automatic flight. In this situation:

- a) The organisers are allowing drones up to 25 kg empty weight for the competition. Ideally, the drone should be able to withstand up to 15 minutes of drizzle and low intensity rain. Also that it can fly in wind gusts of up to km/h36. The organisers reserve the right to carry out tests imitating the above weather conditions on the last day of the competition.
- b) Cruising altitude: MSA (Minimum Sector Altitude) m4 AGL, NOT EXCEEDING ALTITUDE m120 AGL.
- c) We establish that you may fly within the boundaries of the Muchowiec Airport on condition that you do not come closer than 50 metres to the edge of the runway.
- d) The drone must be equipped with devices that automatically maintain altitude and distance from the operator below the maximum permissible value, enable real-time monitoring of flight parameters with a recording function, enable basic localization of the drone (position, speed, altitude, flight direction) and emergency localization in case of loss of communication or control. Conditions are given in paragraph 1.4.h.
- e) Operators may use FPV goggles to supervise the flight, provided that after the start they put the flight controller (apparatus) aside and do not use it until the end of the competition, unless an unexpected situation arises that requires them to take over the controls, of which they must immediately inform the Jury.

2. Description of individual competitions

ATTENTION! DESCRIPTIONS OF INDIVIDUAL FIELD COMPETITIONS ARE DE FACTO SEPARATE REGULATIONS. IN THIS SITUATION, CHANGES IN ENTRIES WILL BE CONDUCTED THROUGH THE WEBSITE DRONIADA.EU. ADDRESSES OF COMPETITION DESCRIPTIONS ARE GIVEN NEXT TO EACH COMPETITION. BEFORE 12 MAY A NEW PDF VERSION COMBINING ALL DESCRIPTIONS AND UPDATES WILL BE MADE PUBLIC.

2.1 SYSTEM DEMO. SATURDAY, JUNE 25

On Saturday June 25 at 11. 00, all teams report in front of the Odlot Restaurant at Muchowiec Airport. Chairman of the Organizing Committee and Chairman of the Judging Panel present the rules of equipment testing as the second part of the "BSP System Demo" competition. Judges have 20 minutes to interview the team.

In this phase each team must start the machine, raise it to a height of 5 metres, fly 20 metres in automatic mode and land it safely. If a team encounters problems and has to abort its attempt, it is entitled to one re-run after the other teams have completed their first approach.

Then the participants of the "Relay" competition start qualifying for Sunday's main competition, which consists of a double flight around Muchowiec airport along a set route. It is a 5 km route up to an altitude of 120 metres AGL. Participants who pass the qualifications will be allowed to take part in the main competition, including flying outside the airport over Katowice Forest Park, over which the route leads, and will score 10 points in the "Relay".

The remaining participants train on the fields of the other competitions, maintaining vertical separation to a ceiling of 60 metres AGL.

After this phase, the Judging Panel will evaluate the Demo System and announce who has won.

Please note that you will no longer be able to make significant changes at the airport. Be sure to have your checklist ready.

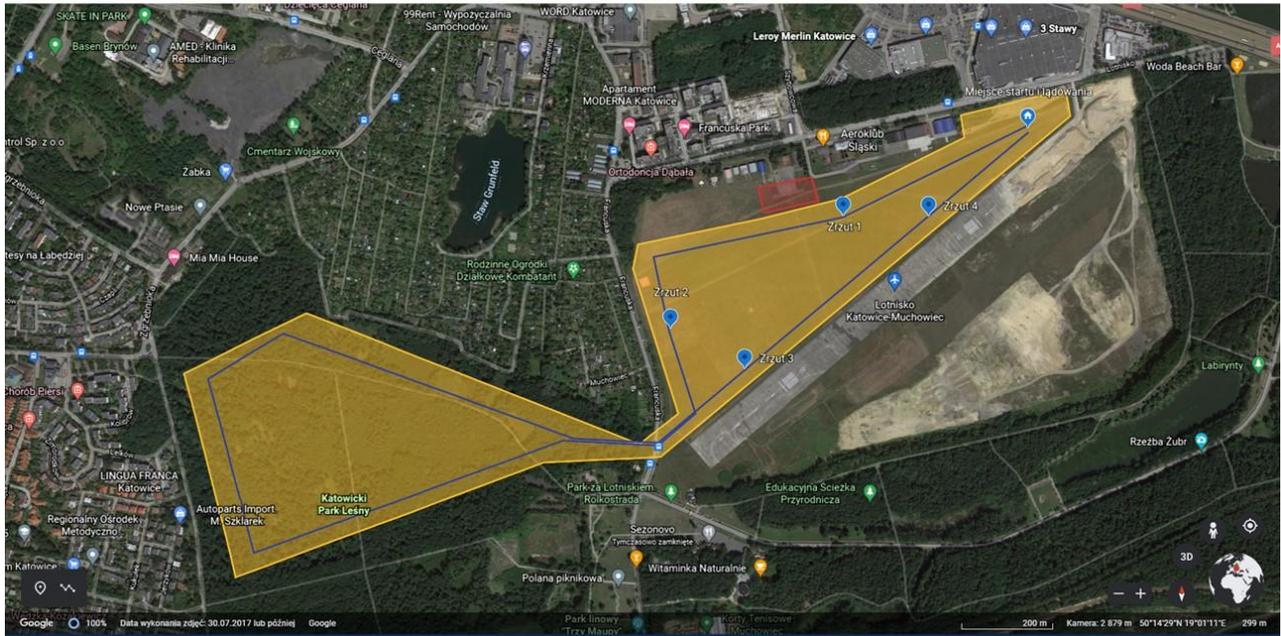
2.2 RELAY. SATURDAY - SUNDAY, 25 - 26 JUNE

[HTTPS://WWW.5ZYWIOLOW.PL/2022/01/09/SZTAFETA2022/](https://www.5ZYWIOLOW.PL/2022/01/09/SZTAFETA2022/)



Trasa pięciokilometrowej konkurencji „Sztafeta”
w ramach konkursu technologicznego Droniada 2022

Najdalszy punkt leży 2 km od miejsca startu; cztery punkty
zrzutu wyłącznie w obrębie lotniska Muchowiec.



Information needs

The competition tests participants' skills in conducting automated, long-range drone missions and in programming a system to accurately drop light beacons.

The competition demonstrates the potential for drones to support search and rescue and firefighting operations where it is important to establish a path of movement for rescue teams.

Scenario

Fog significantly reduces visibility for rescuers who are searching for a missing person in wet meadows. The commander, to ensure the safety of his men before they went into action, decided to map out movement paths for them by dropping glowing beacons from the drones. The drone teams were given a map with a marked route for the rescuers to follow and drop points every 500, 1000, 4000 and 4500 metres from the start. A tall tree was marked on it, which should be avoided without fail - this is the so-called 'forbidden zone' - Non Fly Zone, but the operators were also warned that while setting up the beacons, an immediate need to change the direction of the flight may arise - then the original section gains the status of a dynamic Non Fly Zone. However, it is up to the pilot to decide whether to change the route.

- 1) Prepare an unmanned flying system capable of automatic flight over a distance of 5000 m with Non Fly Zone crossing - both static and dynamic;
- 2) Develop a precision drop system, of which self-propelled light beacons can be a component;
- 3) Complete the mission by accurately dropping beacons every 500, 1000, 4000 and 4500 metres from take-off. Remember that they must also glow after landing.

Principles

Beacons are high-powered flashing LEDs. They can be completely of their own design, e.g. capable of controlled flight (this includes mini-drones), or they can be ordinary bicycle lights. It is the participant who decides what to use. What counts is the goal - to light the way for rescuers.

- Beacons must be dropped from at least 30 metres AGL.
- Drop sites will be flagged and its geographical coordinates will be known before the mission.
- Only one beacon can be dropped on a given drop site.
- The beacon must glow for at least one hour after landing.
- The beacon must not be life-threatening. It must weigh less than 250 grams.
- A beacon can have propulsion and tracking support electronics. However, it must be autonomous.
- The first target lies 500m from the start, the second target 1000m, the third target 4000m and the fourth target 4500m.
- Maximum number of points you can get for hitting the target depends on the distance of the target from the starting point - farthest target = highest number of points
- The accuracy of the drop counts - the number of points depends on the distance of the bikon after landing from the flag (0 to 1 m; 1.1 ~ 3 m - half points, 3.1 ~ 5 m - ¼ points, over 5 m - 0 points).
- During the mission, you must bypass the forbidden zone (geofencing) and for extra points you can bypass the dynamic forbidden zone (see mission plan for more information).
- The entire mission (except landing and take-off) should be in autonomous mode.
- The team chooses how many darts they want to drop in one flight (they can complete the task in several flights or not fly to all the drop sites in one flight).
- Live video coverage of the mission will be given extra credit. It must also be recorded for later viewing (on a control station memory stick or BSP)
- Only unmanned aerial vehicles are allowed to compete.
- Several machines may be used.
- It is permitted to return the machine to the starting point during the competition (stopover).
- Autonomous, parachute and manual landings are allowed. A manual landing does not receive two additional points and a parachute landing will receive two additional points provided the machine lands within a circle of 5 metres from the starting point.
- If the machine takes off in autonomous mode or but is manually thrown or uses a catapult, the take-off is considered autonomous.
- **There is a qualification for the main competition, which is to check the ability of the machines to fly safely. On the eve of the main competition participants take off on a 5 km course inside Muchowiec airport (double loop). No light beacons are dropped then. Only those participants who pass this test will be allowed to fly outside the airport and drop the beacons in the main competition.**

Mission plan

- Inform the Jury about the progress of the mission in question. Whether there will be a stopover, how many machines are involved in the mission, whether there is video transmission, the progress of the mission, etc.
- Perform a preflight check.
- Prepare for take-off and report the start of the mission, for which you are given 60 minutes.
- Start the machine.
- If the team is able to do so, present a live video transmission to the Jury, if a suitable Internet connection is available also broadcast over the Internet.
- Climb to a ceiling chosen by the team, but not less than 30 m.
- Bypassing geofencing to make a dart drop at selected drop sites.

- The jury introduces a dynamic geofencing zone during the course. The jury gives the coordinates and the diameter in metres of the circle to be avoided. This information is given during the mission and the team must modify the live flight plan.
- Return to the launch site and land. The unmanned aircraft can land in autonomous or manual mode. If the landing is manual, the pilot announces the execution of this manoeuvre.
- After the mission, the next teams can start the mission or the Jury can find the beacons.
- The beacons are to flash 60 minutes+ . The beacons should also be appropriately signed (distinctive colour, sticker, etc.) to allow the Jury to easily identify who dropped it.
- The Jury must provide information on static geofencing and the drop site one month before the start of the competition.

Scoring

Relay	Evaluation	Comment
For passing the qualification	10	<i>If participants perform safely and correctly in the qualifying flight.</i>
For dropping a beacon in a designated place within 10 metres	0 - 20	<i>0 point = no hit or outside 5 metres from the flag 2 points = target 500 metres from the start 4 points = 1000 m 6 points = 2000 m 8 points = 4500 m</i>
For accurately dropping a beacon as close to the flag as possible	0 - 24	ATTENTION: Each drop spot is scored separately! <i>6 points = up to 1 metre from the flag 3 points = 1.1 ~ 3 m 1.5 points = 3.1 ~ 5 m 0 points = over 5 m</i>
For every beacon that lights up an hour after the drop	0 - 8	ATTENTION: Each beacon is scored separately! <i>2 points = one hour light (60 min+)</i>
For a correct manoeuvre to avoid a static prohibited zone	2	<i>Static prohibited zone must be avoided</i>
Bonus for a correct manoeuvre to avoid a dynamic prohibited zone	6	<i>Avoid the dynamic prohibited zone</i>
Bikon construction	0 - 12	<i>12 points = a self-propelled beacon, capable of independent flight and autonomous landing in a designated place - it can even be a small drone, as long as it stays lit for 60 minutes after landing; 8 points = any LED light that survives a fall from at least 30 metres. 30 metres. 0 points = non-functioning mechanism.</i>
Take-off and landing in automatic flight mode	0 - 2	<i>A point for take-off, another for landing. The drone must land entirely on the landing area from which it started in automatic mode. Manual take-off and landing is permitted for airframes only.</i>

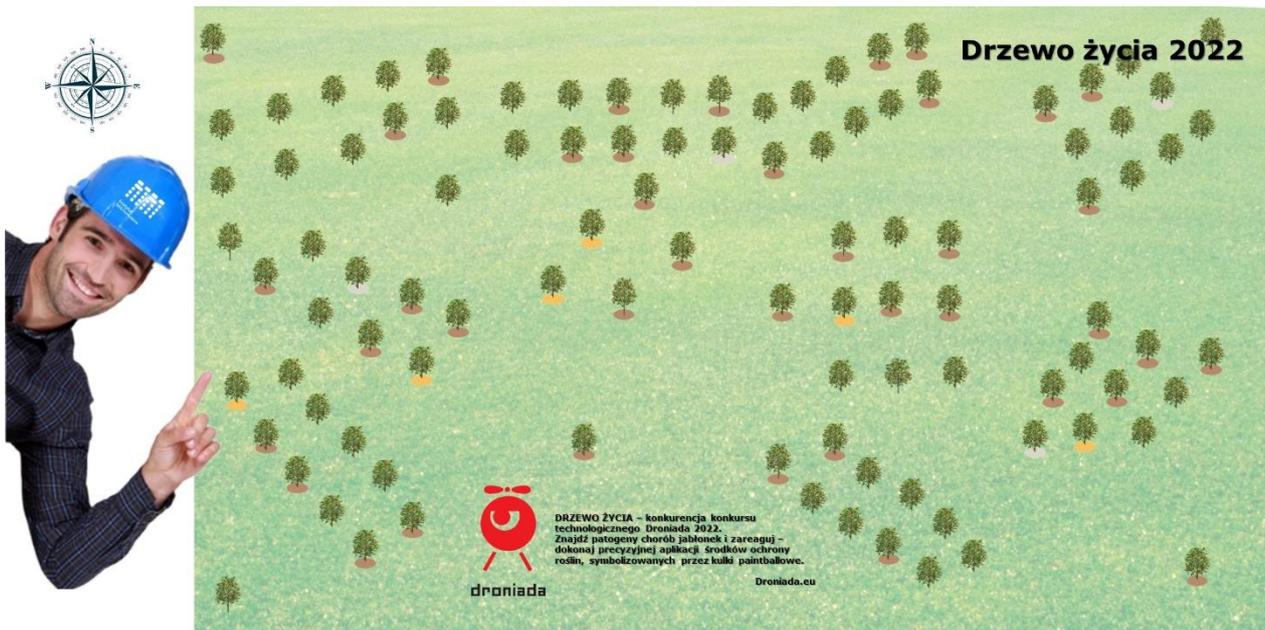
Bonus for video transmission of the flight	5	<i>When the participants of the competition, together with the Jury, follow the course of the mission in real time</i>
The shortest lasting mission of all teams	5	<i>Provided the mission ended with an accurate bikon drop under 60 minutes If not, points are not accrued and the mission is aborted. Points are counted based on the other criteria.</i>
For the second	3	<i>Ibid</i>
For the third time	2	<i>Ibid</i>
For the fourth time	1	<i>Ibid</i>
For lack of logs	-5	<i>According to the regulations the team has up to 30 minutes to send the Technical Judge logs after the mission. ATTENTION: landing of the drone does not end the mission! It is up to the team leader to tell the judges that he considers the mission finished and then they only stop the time, as long as the mission lasts no longer than 60 minutes.</i>
Maximum number of points	100	<i>Penalty points are deducted from this result including bonuses, the total of which is 5.</i>



The competition was prepared by the team of the High Flyers - Academic Scientific Association from the Silesian University of Technology.

2.3 THE TREE OF LIFE. MONDAY, JUNE 27

[HTTPS://WWW.5ZYWIOLOW.PL/2022/01/10/DRZEWO-ZYCIA-2022/](https://www.5zywiolow.pl/2022/01/10/drzewo-zycia-2022/)



Information needs

The competition tests participants' remote sensing skills using machine learning and automatic selection systems. It introduces precision agriculture, including detection of plant disease pathogens and precise dosing of plant protection products.

- 1) How many apple trees are healthy?
- 2) How many apple trees are at the threshold of the disease?
- 3) How many apple trees are infected with mildew and how many with scab?
- 4) How to build a precision crop protection application system usable from the air in automatic flight?

This is an opportunity to combine information analysis and AI skills with mechatronic skills. The drone is the carrier of the system.

Scenario

Apple orchards need special care. Orchard owners are afraid of two pathogens: apple scab and apple powdery mildew. The task is to inspect orchards made up of 100 apple trees growing irregularly over an area of several hectares. The apple trees grow in groups of 10 or 5 trees at a distance of 5 metres from each other, and there are also some that grow alone at a distance from the other trees.

Owners are preparing for new plantings and commodification of orchards, but fear pathogens will attack the new trees. Drones are expected to detect:

- apple trees at the threshold of disease
- apple trees already infected with powdery mildew and scab
- determine how many trees are healthy
- immediately proceed with precision spraying - eliminating the hazard.

Apple trees at the threshold of the disease are symbolised by brown circles (RGB 147, 107, 76) inscribed in a white square of banner 1 metre in diameter with 2 metre composite poles stuck in the middle. It is not known how many such trees there are.

Ten apple trees were attacked by the pathogens scab and powdery mildew in proportions unknown to the participants. Those infected with scab are golden (RGB 212, 159, 65), while

those infected with mildew are beige circles (RGB 249, 246, 227). The others are healthy trees, i.e. they do not have unfolded circles under the composite poles.

The drones arrive on the competition field prepared in this way, or a robot (Martian rover) also arrives. The flying (and driving) robots look for trees at the threshold of disease (brown circles) and for infected trees (gold and beige circles). Here teams can adopt two strategies: The drone scout proceeds immediately to spray, or they call on a specialised robot for help. However, the algorithm must be designed so that scab is treated with agent A and mildew with agent B.

We recommend the preparation of a "detect - eliminate" algorithm mounted on a single machine, but the latter solution is equally legitimate, where it will be necessary (and very interesting) to exchange information between robots and coordinate their work.

The pesticides are symbolised by gelatine paintballs 0.68 inches in diameter, weighing 3.2 g, in yellow and orange, filled with biodegradable paints from any manufacturer.

Take 10 balls of both colours on board. Drones are to dispense them from about 4-6 metres using a gravity or pneumatic mechanism. Scab is identified, then yellow balls fly. Powdery mildew is detected, then orange ones fall.

The team reports progress online on tree detection and ball drop. Please note that using the gravity drop guarantees that the balls will be smashed in about 6/10 cases, while using the pneumatic mechanism has an effect in almost 100%. As a reminder, the breaking of the balls is not necessary and is not subject to scoring, but undoubtedly makes the counting of points and mission effectiveness much easier and faster. The judges have the task of determining whether the correct ball has hit the area occupied by the pathogen.

The teams report remotely in real time on the progress of the mission, sending regular updates on the drone's location, speed and status. Key events are also reported, detection of trees at the threshold of disease, location and identification of the pathogen, triggering of eradication with identification of the selected agent. The result of the mapping, i.e. a map of the orchard indicating the circles occupied by the pathogen and at the threshold of the disease, should also be communicated remotely and immediately during the mission.

The course of the "Tree of Life" competition

Drones have 20 minutes from the time they are allowed to take off to carry out missions in orchards covering an area of 2 hectares. It is necessary to identify apple trees at the threshold of disease and detect outbreaks of plant diseases: scab and powdery mildew, then apply plant protection products.

On a competition field of approximately 2 hectares we place 100 composite poles 2 metres high and 12 mm in diameter. Under these we spread 10 gold and beige wheels and a publicly unknown number of brown wheels with a diameter of 1 metre. The remaining poles are left without wheels. These are healthy trees.

The golden circles symbolise apple scab, while the beige circles represent apple mildew. We will print these circles on 3 mm foamed PVC. Meanwhile, apple trees at the threshold of disease are represented by brown circles inscribed in a square of white banner.

The ball must fall within the circle. If it hits the circle but jumps unexpectedly beyond 50 cm, the task is completed. Generally it should crash - the paint will then spill. The judging panel is required to check where the ball has fallen. If a ball of the wrong colour falls on an infected tree or on the threshold of a disease, no points are awarded. If it falls on a healthy tree, penalty points are awarded. The team will report their progress online in real time.

The key technology is an algorithm that interprets the image (healthy tree, tree at the threshold of disease, tree infected by scab or mildew), combined with a mechanism that

triggers the right plant protection product in the right dose and applied correctly = one right ball falling on the infected tree, or an algorithm correlated with a management system for a team of flying and/or land-based robots.

The pesticides are symbolised by gelatine paintballs 0.68 inches in diameter, weighing 3.2 g, in yellow and orange, filled with biodegradable paints. You must bring 10 balls of both colours on board. Judges check that participants have put in the correct balls.

Scoring

Tree of life	evaluation	comment
For the preparation of a map of the orchards with the trees marked on it, broken down into those at the threshold of the disease and those infected by pathogens (with their distinction) and a message on the state of the orchards	0 - 5	5 points = completed digital map available online as part of the mission report with all trees marked, broken down by disease threshold, scab infected, mildew infected, healthy. Clear message on how many trees there are of each type. 3 points - as soon as the trees with brown, beige and gold circles have been marked and an announcement has been made as to how many there are. 1 point = map of only 10 trees occupied by pathogens with a message what the distribution of diseases is. 0 points = no map. It is generally a 2D image - a top projection of the competition area.
For accurately dropping the correct ball (plant protection product) on an infected apple tree	0 - 10	1 point for an accurate application of the correct bead within a gold (scab) or beige (powdery mildew) circle. A point can be scored when the colour of the ball symbolising the plant protection product controlling the pathogen matches the detected infestation. Yellow ball = scab; orange ball = powdery mildew.
For clearly photographing each outbreak (10 trees) and sending it immediately to the command post in a communicative and clear mission report available online	0 - 5	Each pathogen detected = 0.5 points The images are to be immediately available to the judges in the form of a report e.g. on a website. It can be combined with a digital map.
Bonus for the chosen pathogen detection and elimination strategy	1 - 10	10 points = a successful 'detect - react' action whether using a single drone, a team of two or more drones or a ride-on robot, as long as six or more of the correct balls were applied to the 'sick apple tree'. 5 points = if the algorithm worked correctly but between five and nine balls fell outside the apple tree perimeter. 1 pt = if the algorithm worked correctly, but if only one or no balls fell outside the area occupied by the sick apple tree.
For a comprehensive online mission report	0 -5	5 points - when there is an online map with a full breakdown of the trees, stating which ball was used, where and at what time, showing

		graphically the drone's route and the time taken to complete the task 3 points - as soon as there is information on what ball was used, where and at what time, the route of the drone's flight and the time taken to complete the task are graphically presented. 1 point - as soon as the times and places where the bullets are used are shown 0 - when there is no online report
Drop mechanism	0 - 4	4 points: a working mechanism that gives the ball energy. 2 points = working gravitational mechanism. 0 points = mechanism not working.
Take-off and landing in automatic flight mode	0 - 2	A point for take-off, another for landing. The drone must land entirely within the landing area from which it started in automatic mode
Bonus for flight in automatic mode	3	The bonus is added to the final score as long as the team completes the mission from start to finish in automatic mode.
The shortest lasting mission of all teams	5	Provided the mission has been completed by finding the correct trees and dropping balls under 20 minutes. If not, points are not accrued and the mission is aborted. Points are accrued based on the other criteria.
For the second	3	Ibid
For the third time	2	Ibid
For the fourth time	1	Ibid
For "spraying" a healthy tree or for the wrong product for the pathogen	- 0,5	Penalty points deducted from the competition score for dropping a ball on a healthy tree (no circle). A maximum of 10 points can be lost from this as there are 20 balls on board.
Bypassing the starting point / finishing the mission before the starting point	-2	Deducted from the competition score. The idea is to complete the missions on the landing field.
For lack of logs	-5	According to the regulations the team has up to 30 minutes to send the Technical Judge logs after the mission. ATTENTION: landing of the drone does not end the mission! It is the team leader who has to tell the judges that he considers the mission finished and then they only stop the time, as long as the mission lasts no longer than 20 minutes.
Maximum number of points	50	Penalty points are deducted from this result including bonuses, the total of which is 17.

2.4 INTRUDER. MONDAY, JUNE 27

[HTTPS://WWW.5ZYWIOLOW.PL/2022/01/10/INTRUZ2022/](https://www.5ZYWIOLOW.PL/2022/01/10/INTRUZ2022/)

Scenario

The crew of a transport plane reported a breakdown. On board were military weapons to be delivered to a country wracked by civil war as part of a special operation by one of the services of a friendly country. It was not possible to wait any longer. The plane was diverted to a remote airport. At the same time, a group of officers was sent to protect the cargo to prevent it from being compromised. They had half an hour to check the area and evacuate the bystanders.

Meanwhile, airport CCTV cameras detected a suspicious person wearing a black baseball cap, red polo shirt and blue trousers, who entered the airport with a black sports bag. She probably hid in an airplane hangar where there were already several people obliged to leave. Or perhaps she remained in hiding near the hangar?

The action commander decided to use a drone to find the intruder and his bag. And in order not to cause panic, he directed a regular watchman into the hangar, whose mobile phone sent geographical coordinates to the command post as is done, for example, in Google Maps or Garmin Explore - the "LiveTrack" function. The idea was to have at least one identified person.

The aim of the campaign is:

- automatic flight over a preset area and reporting of detected objects;
- recognition of intruders using artificial intelligence (AI) elements;
- control of people leaving the airport area;
- finding a sports bag using artificial intelligence (AI) elements.

Competition area

The competition area (zone) is an area of approximately 230 m x 180 m in the vicinity of the airfield hangar. Due to ongoing work there, the exact boundaries of the area will be confirmed at the latest 1 month before the start of the competition. It must be assumed that there will be more than one building in the competition area.

Time and conditions for competition

- 1) The task lasts until all mission objectives have been met, but no longer than 15 minutes. A two-minute interval is assumed between two groups leaving the hangar - this time does not count towards the mission.
- 2) There are 15 people + a watchman waiting to be evacuated in the hangar. Person number 17 must be the intruder (if there is one).
- 3) It may be that two people have sports bags on their shoulder, but only one will be the right one in black.
- 4) The action takes place during the day.
- 5) Teams draw one of two scenarios of how the situation at the airport might develop:
 - a) Two groups of e.g. 7 and 10 people come out of the hangar at an interval of two minutes. The intruder, escapes from one of these groups and tries to get out of the zone. The black bag is carried by another person.
 - b) The intruder is outside the hangar. Two groups of e.g. 9 and 7 people come out of the hangar at an interval of two minutes. The intruder leaves a black bag and tries to get out of the zone unnoticed.
- 6) The winner is the one who detects the intruder the fastest, follows him for the specified time and finds his black bag.

Technical requirements and safety rules

A telematics system using a drone equipped with artificial intelligence algorithms is to transmit a live image detailing/identifying the suspect to a website accessible to jurors and document progress in the form of a photograph of the suspect and his current location. The drone should follow the person selected for tracking. Another drone may be used to detect the bag.

- The drone cannot fly over people (it can observe them from a distance).
- There will be no machinery or vehicles on the site.
- The total weight of the drone must not exceed 25 kg.
- The minimum flight altitude is 15 metres AGL (above the hangar roof). The maximum is 120 metres AGL.
- The operator must be able to take control of the drone at any time
-
- The drone must be equipped with a mechanism to automatically return to the vicinity of the take-off point in the event of loss of communication with the operator.
- The starting point is in the competition area, in a corner as far as possible from the centre of the hangar.

Course of competition

Time (in minutes)	Task
-10.00	Preparation, checking the start list, approval of the judges to start the competition.
0.00	Drone launch - start of competition and start of patrol with live transmission to website
0.01	At the same time, a watchman goes to the hangar and transmits his activity via LiveTrack.
02.00	The march of people from the hangar outside the airfield (02.00) according to the scenario drawn by the team
02.01	Drone spots intruder and searches for bag
	Once an intruder is detected, the drone should track it continuously for 2 minutes.
	In parallel, it is looking for a bag unless another machine takes care of it.
15.00	Mission accomplished - drone landed at launch site

1. The task ends with
 - a. After the time has elapsed
 - b. Once all objectives have been met
 - c. After notification by the team leader that the competition is over
2. At the end of the task, the aircraft should automatically land at the starting point. The team leader announces the completion of the mission.

Scoring

Stage	Points	Comment
Automatic take-off, flight and landing	0 - 5	2 points are due if the pilot takes control of the flight.
Correct intruder detection using artificial intelligence	0 - 5	For photo-documented intruder detection with correct identification ¹ in the photo. Intruder detection with other method than using AI = 2 points No photo = 0 points
Online broadcasting	5	Live video feed of the suspect to a website accessible to the jury (can be in map form) with the possibility of recording the action. Minimum 2 minutes of online coverage.
Correct tracking of an intruder, providing its GPS position every 30 seconds.	5	Accuracy up to 5 m + time stamp - indicating the point where an intruder is
Correct reception of GPS "LiveTrack" data and its visualisation	5	The watchman sends a "LiveTrack" to be received and shown to the judges on the website.
Correct bag identification with GPS positioning using artificial intelligence	5	Identify the correct tourist bag (perhaps using machine learning) and provide the geographical coordinates on the web page
Fastest completed mission	0 - 5	The fastest team, having completed the mission in full, gets 5 points Second: 4 points, third: 3 points All others: 1 point each. Mission accomplished quickly but with no results achieved; 0 points
Flying over people	-5	The first time negative points, the second time an order to abort the mission immediately.
Detection of a person outside the zone	-2	If the system started to identify people outside the zone.
Incorrect detection of an intruder	-2	Identifying another person as an intruder.
Intruder escapes from zone without being detected	-1	The intruder evades capture.
Causing danger (to be assessed by the jury)	-2	<i>Authors:</i> <i>Marcin Gałczyński, Wojciech Gruźliński, Sławomir Kosieliński, Maciej Zawistowski</i>
TOTAL	35	

2.5 CONSTRUCTION. TUESDAY, JUNE 28

[HTTPS://WWW.5ZYWIOLOW.PL/2022/01/10/BUDOWA2022/](https://www.5ZYWIOLOW.PL/2022/01/10/BUDOWA2022/)

Information needs

The competition tests participants' photogrammetry and remote sensing skills using machine learning in simulated warehouse construction site conditions. It creates a decision support system through which it becomes possible to meet the following information needs of construction companies:

- 1) Does the installation follow the design created in the BIM environment?
- 2) What is the accuracy of assembly of prefabricated elements?
- 3) What is the efficiency of the workers - do they really do their work as declared by the foremen?
- 4) Do workers comply with health and safety legislation?

And from the perspective of the drone ecosystem, the competition is an opportunity to demonstrate in practice the measurement and remote sensing capabilities of flying robots using RTK GPS (Real Time Kinematic) and machine learning technologies.

Scenario

Construction of a 50 x 25 metre warehouse is underway. According to the planning office, 25 prefabricated reinforced concrete columns of two sections have already been erected. In the corners will be columns with a diameter of 120 cm. The others will have a diameter of 10 cm each. Four workers in yellow helmets and their foreman in a red helmet are roaming around the construction site. The blue-helmeted supervisor appears unannounced. After a while he has doubts whether the poles are in the places where they should be according to the digital design (BIM environment), whether they are properly placed at an angle of 90 degrees (i.e. whether they hold the plumb line), then whether they have the declared height of 200 cm, in a word, whether the construction is proceeding correctly, as declared by the foreman in his reports, followed by the design office. His watchful eye also caught the fact that there are probably people working here without helmets. It only takes five nonconformities with the design and non-compliance with health and safety regulations to stop the construction and impose a hefty fine on the contractor. He uses drones to confirm his observations.

Tasks

- Automatic flight over a preset area and reporting of detected objects;
- Detecting poles where there are doubts as to whether they have been erected in accordance with the design. ATTENTION: It may happen that all 25 poles have been placed incorrectly, or it may even turn out that there is one more or one less pole than declared by the foreman. It only takes 5 construction errors - including a missing pole or an excess - for the supervisor to issue a stop-work order. The ideal is to achieve measurement accuracy of 1 cm and to confirm plumb line or to show deviation from plumb line with accuracy of 5 degrees.
- Finding all the red, yellow and blue helmets on the construction site and showing where they are. If the helmets are hanging from two-metre poles, it means the workers are wearing them on their heads, and if they are anywhere else, the brigade is not following health and safety regulations.
- Generate an online report on the basis of which the supervisor will issue his decision.

Competition area

"The hall" will take the form of a regular rectangle 50 x 25 metres, in the tops of which - according to the design office - are to stand 4 poles (hay bales: 1.2 m high, 1.2 m in diameter), and between them probably 21 poles, i.e. telescopic boxes 100x100 mm 1000 - 2000 mm.

Please note: the hall design that the participants receive in *dxf or equivalent format (autocad) reflects the state to the knowledge of the design office based on the statements of the foreman. The actual state is to be examined. This means that the judges evaluate the results on the basis of three plans: the project office, the actual one prepared by the organisers and finally the one created during the given mission. Participants receive the blueprint 60 minutes before the start.



Time and conditions for competition

- 7) The mission lasts no longer than 30 minutes.
- 8) Participants may use RTK ground stations.
- 9) The design office sends the project file (i.e. the status on site to their knowledge) 60 minutes before the start of each participant by e-mail to a predetermined address and also provides a link to download it from OneDrive. During the preparation period, participants receive test project files. They are also entitled to take their own measurements on the building site on the day before the competition.
- 10) The action takes place during the day.
- 11) Participants are to confirm the following observations of the supervisor in the form of a report:
 - c) Is construction proceeding according to design?
 - i. Conduct a fly-through and visualise the general differences between the design and the actual state
 - ii. How many poles are there actually?
 - iii. Do they stand where the design office thinks they do - you need to measure at least one pole as accurately as possible - the ideal is to achieve a measurement of 1cm - and relate the measurement to the design: what is the difference? One proof is enough for the inspector, but he will be happy if there are more measurements.

- iv. Do the poles stand straight - the surveyor says one or more are/are deviated from the vertical by 5 degrees or more. One piece of evidence is enough for him, but he will be happy if there are more measurements.
 - v. Do they have a declared height of 200 cm and a diameter of 10 cm - the inspector has doubts. One proof is enough for him, but he will be happy if there are more measurements.
- d) How many people have safety helmets on their heads, and if they don't, where do they lie? Give the geographical coordinates of all helmets, collect photographic evidence and identify those that are not on the head (pole).
- 12) The one who scores the highest number of points wins.

Technical requirements and safety rules

More than one drone may be used in the competition. The drone may be RTK class, but if someone takes off without RTK on board and takes all measurements correctly, they will receive extra points. In this case we allow the use of traditional measurement methods and combine them with the measurement from the drone. We agree to have selected individuals enter the field and set up surveying equipment during the mission before the drone enters the construction area.

- A drone must not fly over people.
- Ground-based and drone RTK systems and traditional survey equipment are permitted
- There will be no machinery or vehicles on the site.
- The total weight of the drone must not exceed 25 kg.
- The minimum flight altitude is 15 metres AGL. The maximum is 120 metres AGL.
- The operator must be able to take control of the drone at any time
-
- The drone must be equipped with a mechanism to automatically return to the vicinity of the take-off point in the event of loss of communication with the operator.
- The starting point is near the power connection.

Course of competition

Time (in minutes)	Task
-60.00	The team receives the design from the design office in 'CAD' format by email or downloads it from OneDrive.
-10.00	Preparation, checking the start list, permission from the judges to start the competition
0.00	Launch of drone(s) for photogrammetric and remote sensing mission
30.00	Maximum time for data collection with the drone. Once the drone has landed, there may be a phase of creating and uploading the report.
60.00	End of mission.

3. The mission concludes
 - a. After the time has elapsed
 - b. When all objectives have been met - a clear message from the team leader
 - c. After the decision of the jury or the flight director
4. Upon completion of the task, the aircraft should automatically land at the take-off point.

Scoring

	Stage	Points	Comment
1)	Automatic take-off, flight and landing	0 - 3	Only 1 point shall be awarded if the pilot takes control of the flight. Does not apply to manoeuvres for the protection of persons or property
2)	Visualisation of differences between design and actual state	0 - 2	It is about graphically comparing the design with the actual state. If the visualisation is available online off-the-shelf = 2 points; if it is available before the end of the mission in the form of a graphic = 1 point; No documentation = 0 points
3)	Determination of the actual number of poles	0 - 2	Indicate in the online report, of which the visualisation is a part, how many poles there are with geographical coordinates of their centres or a photo of the place where the pole should be or is over standing = 2 points Photo only = 1 point. No data = 0 points
4)	Measurement of pole position with accuracy of 1 cm	0 - 5	If the position of one pole is measured to an accuracy of 1 cm and the difference between the measurement and the design is given in the online report = 5 points; if the pole is measured to an accuracy between > 1 cm and < 5 cm and the difference between the measurement and the design is given = 4 points; if the pole is measured to an accuracy between > 5 cm and < 10 cm and the difference between the measurement and the design is given = 3 points; No measurement with the expected accuracy = 0 points If the team measures other poles in addition, they will receive an extra bonus. The condition is to maintain an accuracy of 1 cm.
5)	Vertical measurements	0 - 5	The team chooses one of the poles and has to confirm or deny that it is standing straight with an angle (90 deg or 95 deg or maybe 85 deg) = 5. If the accuracy of the measurement is within > 5 deg, < 10 then only 3 points are due. No measurement = 0 points If the team measures other poles in addition, they will receive an extra bonus [see further].
6)	Correct identification of column heights	0 - 5	The team chooses one of the poles and has to confirm or deny that it is 200 cm high = 5 points If the accuracy of the measurement is less than the assumed 2 cm and falls within the range > 2 cm < 5 cm, only 3 points are due. No measurement = 0 points

			If the team measured other poles in addition, they will receive an extra bonus. [see further].
7)	Number of helmets	0 - 3	For every helmet of six found and documented with a photo = 0.5 points. No correct GPS readings over 3 metres = 0 points/. Bonus for helmets not on head - see bonus.
8)	Online report	0 - 5	It includes: visualisation, giving position and helmet information, proposing a decision: to close the site or not (if deficiencies < 5, the site works; if 5 or more = stops working. Report contains only half of the required information = 2.5 points No online report = 0 points
9)	Position measurement bonus	5	If more than 1 column is measured. The condition is to maintain an accuracy of 1 cm.
10)	Bonus for measuring the vertical	5	Where more than 1 column is measured. The condition is to maintain an accuracy of 5 degrees.
11)	Height measurement bonus	5	If more than 1 column is measured. The condition is to maintain an accuracy of 2 cm.
12)	Bonus for detection of violations of health and safety regulations	5	For correctly identifying and documenting with a photo helmets that are not on the head (two metre pole).
13)	Bonus for no RTK drone	10	When a drone is directed to a mission without RTK and yet achieves the desired accuracies, i.e. for position measurement between 1 and 10 cm, and for vertical measurement up to 10 degrees, for height measurement up to 5 cm.
14)	Fastest completed mission	0 - 5	The fastest team, having completed the mission in full, gets 5 points Second: 4 points, third: 3 points All others: 1 point each. Mission accomplished quickly but with no results achieved; 0 points
15)	Flying over people	- 5	The first time negative points, the second time an order to abort the mission immediately.
	TOTAL	From 55 to 65	I.e. a team with an RTK drone receives a maximum of 55 points, while a team without an RTK drone receives 65 points, as long as it achieves the target accuracy.

Author: Sławomir Kosieliński

2.6 SHOW OF CHAMPIONS. WEDNESDAY, 29 JUNE

This is a competition for the winning participants of the individual competitions, who will join the demonstrations of drone companies during a special open day for the participants of the World Urban Forum in Katowice. The demonstrations will be followed by the announcement of results and the presentation of prizes.

3. Awards

All participants who take part in the Droniada will receive commemorative diplomas by e-mail.

The cash prizes will be transferred to the account of the participating university, non-governmental organisation, business entity or private person designated by the team. The winners are required to pay the tax due on the prize money. The distribution of prizes will be presented on Droniada.eu by the end of March.

4. Protection of personal data

1. Participants' personal data will be processed for the purposes of organising and promoting the Organisers' events, selecting the winners of the Droniada and awarding and dispensing prizes.
2. Participants' personal data will be processed in accordance with the applicable legislation, in particular the Data Protection Act of 10 May 2018.
3. The processing and use of data also includes the publication of: name, surname, town and organisation name.
4. The participant acknowledges that he has the right to access and correct his data.
5. Providing personal data and consenting to its processing is voluntary but necessary to participate in the Droniada.

5. Final provisions

1. During the competition Participants (in the narrower sense - competitors, i.e. those directly taking part in the competition) should comply with instructions given by persons responsible for safety, security services and other persons designated by the Organisers.
2. Each team member is required to sign a statement of knowledge of the regulations. By signing the above statement, the competitor agrees to provide first aid, perform other medical procedures and transport the injured to a safe place by medical and paramedical personnel acting on behalf of the Organisers.
3. The competitor declares that he/she is fit to take part in the Droniada, that he/she is not aware of any health reasons excluding him/her from participation and that he/she takes part at his/her own risk and acknowledges that participation in the competition involves physical effort and possible loss of equipment. In addition, there may be other risk factors associated with participation in the competition which cannot be foreseen at this time. Signing the declaration of knowledge of the rules means that the participant has considered and evaluated the extent and nature of the risks involved in taking part, and takes part voluntarily and solely at his/her own risk.
4. After the competition there will be a random inspection of the equipment, which the competitor designated by the Commission must absolutely submit to.
5. The participant accepts these regulations and agrees to the free use of his/her image recorded in the form of a photograph or video recording and grants the Organizer a free license to use it in all fields of exploitation, including: recording and dissemination in any form and entering into computer memory, use for the promotion and organization of the events of the Mikromakro Institute Foundation, sharing with sponsors and partners in order to promote them in the context of participation in the event, placing and publishing in the Organizers' publications, on promotional printed materials of the Organizer, in the press, on websites and in television and radio broadcasts.

6. The Organiser guarantees copyright protection for the solutions of each team.
7. The Organiser reserves the right to cancel the competition or to discontinue it without giving reasons.
8. The Organisers alone shall be entitled to the binding and final interpretation of these Regulations. In matters not covered by these Regulations the Organisers shall decide. If any provision of the Rules and Regulations is found to be partially or wholly invalid or unenforceable - all other provisions (in whole or in part) shall remain valid.