



IPSC IT FEST 2026

Terra Incognita

Rulebook

The Doon School

DEHRADUN

This document is part of the Terra Incognita document pack. Anything not covered by the Robot Specification, Arena Specification, Judging Rubric or Inspection and Safety is governed here.

Front matter

Item	Detail
Event name	Terra Incognita
Technical name	Autonomous Mapping and Pathfinding
Category	Robotics
Event Head	Trijat Kumar Sah
Deputy Event Heads	Aaryansh Kejriwal and Arnav Kejriwal
Participants per school	2

Terminology

Term	Meaning
Official run	The single timed attempt of a team, lasting at most 5 minutes, that begins when the team starts the robot and the event official confirms the beginning of the run (§3.1).
Preparation period	The 2-minute period before the official run in which a team prepares its robot (§3.2).
Start spot	The 30 cm × 30 cm green spot in one corner of the arena that carries the "X" (Arena Specification §3.1).
Starting position	The intersection point of the "X" on the start spot. At the start of the run, the robot is placed with its centre mark directly above this point. The robot aims to finish as close to this point as possible.
Fixed obstacle	A wall element of the arena that does not move.
Cell	A 10 cm × 10 cm square of the arena floor, marked by the grid lines. The whole arena is divided into cells (Arena Specification §6).
Wall cell	A cell that the reference map marks as wall (Arena Specification §6).
Grid map	The map that the robot generates during the official run, in which every cell is marked either "wall" or "no wall".
Reference map	The organisers' true grid map of the arena (Arena Specification §6.3).

Term	Meaning
Centre mark	A visible cross on the robot's top surface at the centre of its length and width (Robot Specification §1.2).
Final distance	The distance, measured at the end of the official run, from the point on the floor directly below the centre mark to the starting position (Judging Rubric §2.2).
Touch	One physical intervention by a team on its robot during the official run: one continuous period in which any team member is in contact with the robot (§4.1).
Wall contact	Any contact between the robot and a wall or fixed obstacle. Contact that continues without a break counts as one wall contact (Judging Rubric §3).
Event organisers	The officials who run the event and who rule on matters not covered by the pack.

1. Overview

1.1 Terra Incognita is a SLAM-based robotics challenge in which teams develop a robot that autonomously explores and maps an unknown environment. The event tests the practical implementation of Simultaneous Localisation and Mapping (SLAM), autonomous navigation, sensor integration and loop closure.

1.2 In its official run the robot must:

- generate a grid map of the arena, cell by cell, as set out in Arena Specification §6;
- complete one lap of the arena and finish as close as possible to the starting position.

1.3 After the run, the team shows the grid map on a monitor and the organisers check it cell by cell against the reference map (§3.3).

1.4 The competition gives participants freedom in their choice of hardware and software, and sets a common set of rules so that all teams compete under comparable conditions.

2. Teams

2.1 Team size:

- each team may consist of a maximum of 2 members;
- a participant may be a member of only one team;
- teams must register before participating in the competition.

2.2 Team responsibility. A team is responsible for:

- designing and preparing its robot;
- ensuring that its robot complies with the Robot Specification;
- ensuring that its robot is safe to operate;
- operating its robot during the preparation period;
- submitting its repository (§10);

- following all instructions given by event officials.

3. Format and progression

3.1 Official run.

- Each team receives 2 minutes of preparation time and 5 minutes of official run time.
- Each team receives only one official run.
- The official run begins as soon as the team starts the robot with its start switch (Robot Specification §4.2) and the event official confirms the beginning of the run.
- The official run ends at the first of these: the team tells the event official that the run is complete; the 5-minute limit expires; the run is terminated under §4.2 or §6.
- When the run ends, the team stops the robot's motors as soon as the event official tells it to, without moving the robot. This is not a touch. The robot must keep the grid map it generated (§3.3). The final distance is then measured where the robot stands.

3.2 Preparation period. Teams may use the entire 2-minute preparation period as they choose. During this period, teams may:

- position the robot;
- turn on the robot;
- configure software;
- check sensors;
- select the operating mode;
- perform system checks;
- carry out any other preparation necessary for the run.

All preparation activities must be completed within the allotted 2 minutes.

3.3 Map display after the run.

- After the official run ends, the team connects its robot to the HDMI monitor provided by the organisers and shows the grid map generated during the run. The team may instead connect a laptop that only displays what the robot sends.
- Teams bring their own cables and any adapters needed to connect to the monitor. The organisers do not provide cables or adapters.
- The team has 2 minutes after the end of the run to show the map.
- The map shown must be the map that the robot generated during the run. It must not be edited, regenerated or reprocessed after the run ends.
- The map must be shown as set out in Arena Specification §6.4.
- The organisers then check the map cell by cell against the reference map (Judging Rubric §2.1).

3.4 Tie-break order. In the event of equal total scores, ties are broken in the following order:

- first: higher Grid map points (Judging Rubric §2.1);
- second: higher Repository points (Judging Rubric §2.3);

- third: lower official run time, measured from the start of the official run to its end (§3.1).

If teams remain tied after all listed tie-breaks, the teams share the placing.

4. Run structure

4.1 Autonomous requirement. The robot must operate fully autonomously during the official run. After the robot has been started:

- no manual driving is permitted;
- no manual navigation is permitted;
- no movement commands may be sent to the robot;
- no participant may direct the robot through the arena;
- the robot must independently perform its navigation and SLAM operations.

A team may physically interact with its robot to attempt to correct a failure. Each physical intervention counts as one touch, and each team is permitted a maximum of 5 touches per official run. A touch may include actions such as:

- resetting a physical component;
- repositioning a loose component;
- restarting the robot;
- correcting a mechanical issue;
- carrying out another physical action required to restore operation.

Physical intervention may not be used to manually navigate the robot, to reposition the robot in the arena or to provide the robot with positional advantages. Once a team has used all 5 touches, no further physical intervention is permitted during that run. A sixth touch disqualifies the run (§6.2).

4.2 External commands.

- Any command sent to the robot during the official run that directly controls, alters or assists its movement or navigation is a violation of this Rulebook. It leads to disqualification from the run, and the run ends immediately.
- Communication that carries only non-control information, as permitted by Robot Specification §5.1, is not a violation.

4.3 Robot failure.

- If a robot stops functioning during the official run, the team may attempt to correct the issue. The official 5-minute timer continues to run while the robot is being repaired or restarted. The team does not receive additional time because the robot has stopped functioning.
- If the robot cannot be restored to operation, the team may allow the run to continue until the 5-minute period expires.

5. Scoring

5.1 The event organisers score the official run using the criteria in the Judging Rubric §2. The total is 100 points: 70 for the grid map, 15 for returning to the starting position (ranked by final distance) and 15 for the repository.

5.2 Every criterion except the repository is scored by counting or measuring. There is no judgement of quality. The repository is scored by checking the listed items (Judging Rubric §2.3).

5.3 Points are deducted for each wall contact (Judging Rubric §3).

6. Penalties and disqualification

6.1 Each wall contact that causes no damage is a deduction of 2 points (Judging Rubric §3).

6.2 A run is disqualified, and ends immediately, if the robot damages any part of the arena, or if the team manually controls the robot, sends a prohibited movement or navigation command (§4.2), makes a sixth touch (§4.1), uses prohibited external computation (Robot Specification §5.2 and §8.2), uses the internet or a hotspot (§8.1), deliberately manipulates the arena, or creates a serious safety risk. A disqualified run scores 0 for criteria 2.1 and 2.2 of the Judging Rubric. Repository points still count.

6.3 A team is disqualified from the event for deliberate cheating or interference, deliberate damage to the arena, continuing unsafe operation after an official has told the team to stop, or abusing or refusing to comply with an official.

7. Devices

7.1 Participants are allowed to bring laptops to the arena. Phones are not permitted at all.

7.2 The organisers provide a monitor with an HDMI input for displaying the grid map. Teams must bring their own HDMI cables and any adapters needed (§3.3).

7.3 Power outlets are provided in the respective event locations for all teams.

8. Network

8.1 No internet access is provided, so that teams compete on equal terms and no AI platforms can be used. Hotspot sharing is also not allowed. A team found using the internet or a hotspot has its run disqualified at once (§6.2).

8.2 Teams with a question may ask the nearest event official, who will help to resolve it.

9. Provided resources

9.1 The organisers provide the arena, the monitor and power outlets. Nothing else is provided. In an emergency, the school will try to fulfil a team's request but does not guarantee it.

10. Repository

10.1 Format. Each team submits a link to one repository that holds the source code of everything that runs on its robot, with a README at the top level.

10.2 Mechanism and deadline. The team gives the link to the event organisers by the deadline that the event organisers announce. Commits made after the deadline are ignored.

10.3 Late or malformed submission. A repository that is submitted late scores zero for the timeliness item. A link that cannot be opened by the organisers scores zero for all repository items. Judging Rubric §2.3 lists the items.

10.4 Each team member must be able to explain the code in the repository entirely (Inspection and Safety §1).