



SLIIT

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Ninth Annual SLIIT

Robotic Competition

**Open UAV Race Competition
Technical Specification**

Organized
By

**Department of Electrical and Computer Engineering
Faculty of Engineering
Sri Lanka Institute of Information Technology**

Introduction

SLIIT ROBOFEST, as the premier robotic competition in Sri Lanka, is dedicated to making the annual competition more innovative, exciting, and competitive each year. Thus, this year's competition has been designed to challenge the competitors in terms of technical aptitude, innovation, and imagination, which, no doubt, will make for an interesting and tightly contended competition.

To compete, each team must design and build a fully autonomous robot with technical specifications outlined in this document. Key features of the terrain and the tasks to be performed are also delineated in this document. Based on the design and performance of the robots, an impartial panel of judges will adjudicate the competition. The decision of these judges will be the final decision.

Also, please note that any amendments to the rules will be updated on the website, www.robofest.lk. If you have any questions or clarifications you may contact the ROBOFEST organizers through email robofest@slit.lk or phone 0715618988.

Short Description: Fully Autonomous Aerial Flying Vehicle, have to complete figure 8's around two poles that are several meters apart. The vehicle has to demonstrate its ability to maneuver quickly and accurately in three dimensions.

1. General Requirements

1.1 Field Dimensions

The field is at least 7 m long, 4 m wide and 2 m high. It is covered by a safety net. Two black poles are placed in the field at least 3 m apart. The poles are approximately 5 cm x 5 cm square and 2 m high. There is guaranteed free space of 2 m around the poles.

As a navigational aid there is a black dashed line on a bright background on the floor. The line has a width of approximately 5 cm. Each dash is approximately 30 cm long and the gap between two dashes is approximately 10 cm. The line is indicating the figure-8 around the poles.

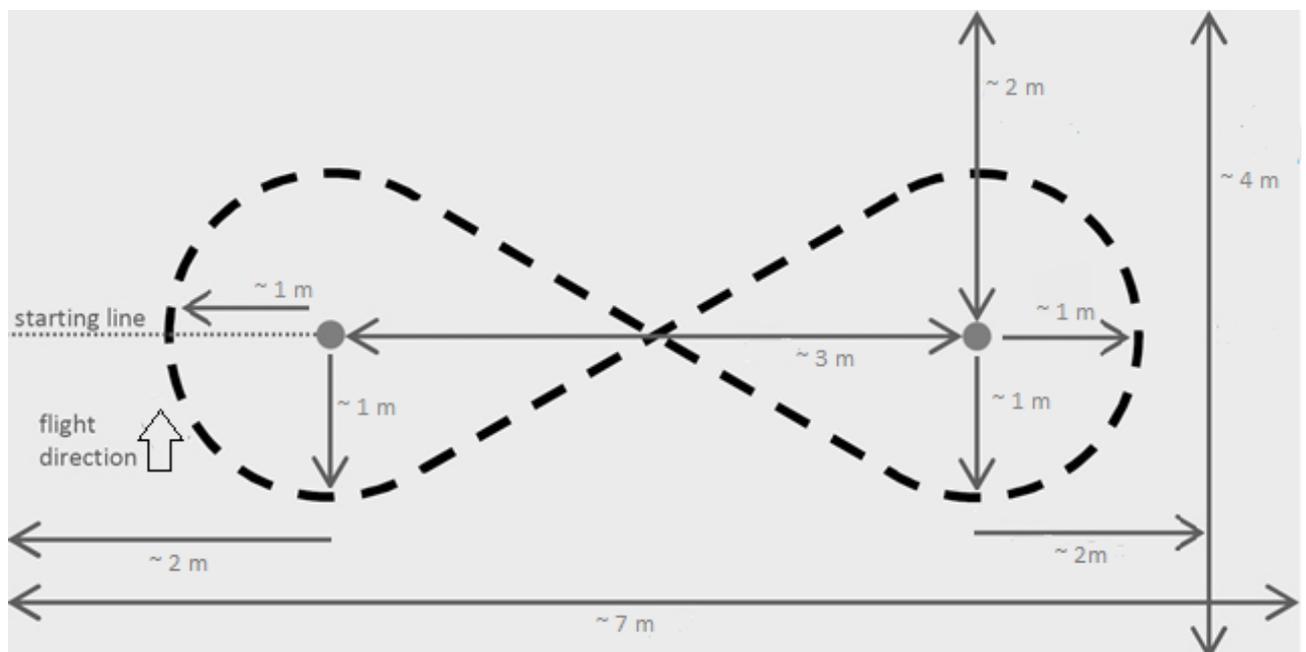


Fig. 1: Top view of the race area

2. Requirements for Vehicle

2.1. General Vehicle Specifications

1. The vehicle must be an aerial vehicle, which is able to fly in a height lower than 1.5 m.
2. The vehicle must be autonomous. Any control mechanisms can be employed, as long as the mechanism does not interact with a human.
3. Aerial vehicles include fixed-wing aircraft, rotary-wing aircraft (helicopter, Multi-copter), flapping-wing, or airship designs.
4. All aircrafts shall not exceed a total weight of 2 kg
5. Please note that the Airship designs must fit within an arena.

2.2. Class Specifications

1. Computational power can be either on board or on an external computer, which communicates wirelessly with the vehicle.
2. Additional navigational aids can be used. These can include the dashed-line on the floor, active or passive navigational aids inside the race area, or additional guides on the floor. Active navigational aids (e.g. infrared beacons) must run on battery; there are no power outlets available.
3. Setup of navigational aids must take place within the preparation time slot.

2.3. Security and Safety

1. Failure to comply with the security and safety rules, will lead to disqualification.
2. Vehicles may not have sharp or potentially dangerous parts, excluding normal propellers and helicopter-blades.
3. A human safety pilot must be able to take over control of the robot at any time in case of an emergency.
4. Entrance to the flight area is only permitted for one team member of the scheduled team after clearance by the judge.
5. Teams must always follow the instructions of the judge.
6. The judge can be abort every flight.

2.4. Homologation

1. All participating robots are allowed to compete only after passing the homologation. This check will be performed before the first flight and covers all points listed below.
2. The robot must show its ability to remain at a flying height lower than 1.5 m without human intervention regarding the height (lateral control is allowed).
3. The ability to safely control the robot has to be shown by the team member who will operate the robot during the competition (robot operator).
4. The vehicle must comply with all security and safety requirements.

3. Game

3.1 Aim of the Game

1. A vehicle has to complete as many figure 8's as possible around two poles within a specified flight time of 3 minutes.
2. During the flight the vehicle has to remain mainly within the flying height below 1.5 m above the ground.

3.2. Start of the Game

1. Each team is allocated a preparation time slot of 5 minutes. During the preparation time one team member (robot operator) is allowed to enter the race area in order to prepare for the start.
2. When preparation is finished or the 5 minutes preparation time is over the judge starts the 3 minutes flight time and the robot operator can start the robot.
3. The start has to be performed at the starting line.
4. During the flight the robot operator has to leave the race area for safety reasons.

3.3. Restart

1. A flight ends when the robot touches the ground or the safety net or the robot operator decides to abort the flight.
2. Multiple starts are allowed during the flying time. The robot operator may re-enter the race area after the judge's clearance and restart the robot.
3. During the flight the robot operator has to leave the race area for safety reasons.

3.4. End of the Game

The race finishes when the flying time slot ends or when the judge aborts it.

4. Scoring

1. The robot has to start the fly in clockwise and should follow the line in figure 8's around the two poles shown in Fig. 1.
2. The robot scores one point for each correctly completed figure 8.
3. The sum of all points obtained during one continuous flight counts.

5. Declaring Objections

1. No objections shall be declared against the judges' decisions.
2. The lead person of a team can present objections to the Committee, before the game is over, if there are any doubts in the exercising of these rules. If there are no Committee members present, the objection can be presented to the judge before the game is over.

6. Flexibility of Rules

As long as the concept and fundamentals of the rules are observed, these rules shall be flexible enough to encompass the changes in the number of players and of the contents of games. Modifications or abolition of the rules can be made by the local event organizers as long as they are published prior to the event, and are consistently maintained throughout the event.

7. Liability

1. Participating teams are always responsible for the safety of their vehicle and are liable for any accidents caused by their team members or their vehicles.
2. The organizing committee members will never be held responsible nor liable for any incidents and or accidents caused by participating teams or their equipment.

8. Registration

Please fill out the form online, the link which as follows

https://docs.google.com/forms/d/e/1FAIpQLSdjbeNxPW4gKZkOxf2JBr5Mo8MfTVF3AqXnwChzA_FSrET8mA/viewform?usp=sf_link

Dead line : 31st July 2018

For further details visit robofest@slit.lk

- End of Specification -