

8. Mission Challenge(Medical Mission)

Level : Junior / Senior

Name of Event:	AI Mission Challenge: New Global, Future Medical
Robot per team:	1 robot
No. of Player/s:	1 - 2 players per team
Age Category:	Junior / Senior
Robot Control:	Please see below
Event Summary:	In the bustling city of Metropolis, the Central Hospital is renowned for its exceptional patient care and advanced robotics integration. With the latest advancements in medical technology, the hospital has acquired a fleet of intelligent robots to assist in transporting the patient and the medicines within its vast corridors.

Sample Video: <https://bit.ly/GRC2024-MCvideo>

1. Robot specifications

- 1.1. Any microcontrollers, type or brand of wheeled robot is allowed.
- 1.2. Robots can be pre-built or built on-site.
- 1.3. Robots must be intelligent and capable of voice recognition.
 - 1.3.1. The robot shall demonstrate functional voice recognition during the official inspection or at the start of each official run, as determined by the referee.
 - 1.3.2. Robots that execute tasks solely through pre-programmed sequences or other manual triggering methods in place of voice recognition shall be deemed non-compliant with Rule 1.3.
- 1.4. A robot that is non-compliant with Rule 1.3 shall be disqualified from the current run, and no score shall be awarded for that run.
- 1.5. Robots should have independent power supply. Only batteries are allowed.
- 1.6. Max size: 15 x 15 cm (LxW). No height limit.
- 1.7. Max weight: 500g
- 1.8. Max number of line tracing sensors: 4

2. Robot restrictions

- 2.1. Expanding robots are NOT allowed.
 - 2.1.1. Robots must remain within the maximum dimensions specified in Rule 1.6 throughout the entire match.
 - 2.1.2. Robots that intentionally expand, unfold, extend, deploy mechanisms, or otherwise exceed the maximum permitted dimensions during gameplay shall be considered in violation of this rule.
 - 2.1.3. A robot found in violation of Rule 2.1 shall be disqualified from the current run, and all points earned during the run shall be forfeited.
- 2.2. Robots shall NOT damage the race track in any way, deliberate or NOT.
 - 2.2.1. Robots shall not tear, puncture, scratch, stain, deform, or otherwise alter the official playing field or any game element.

2.2.2. If the referee determines that a robot has damaged or is likely to damage the playing field or game elements, the referee may immediately stop the run.

2.2.3. A team whose robot damages the playing field or game elements during a run shall have its current run terminated, and only the points earned prior to the violation shall be counted.

2.2.4. Deliberate or repeated violations of Rule 2.2 may result in disqualification from the competition at the discretion of the Head Referee.

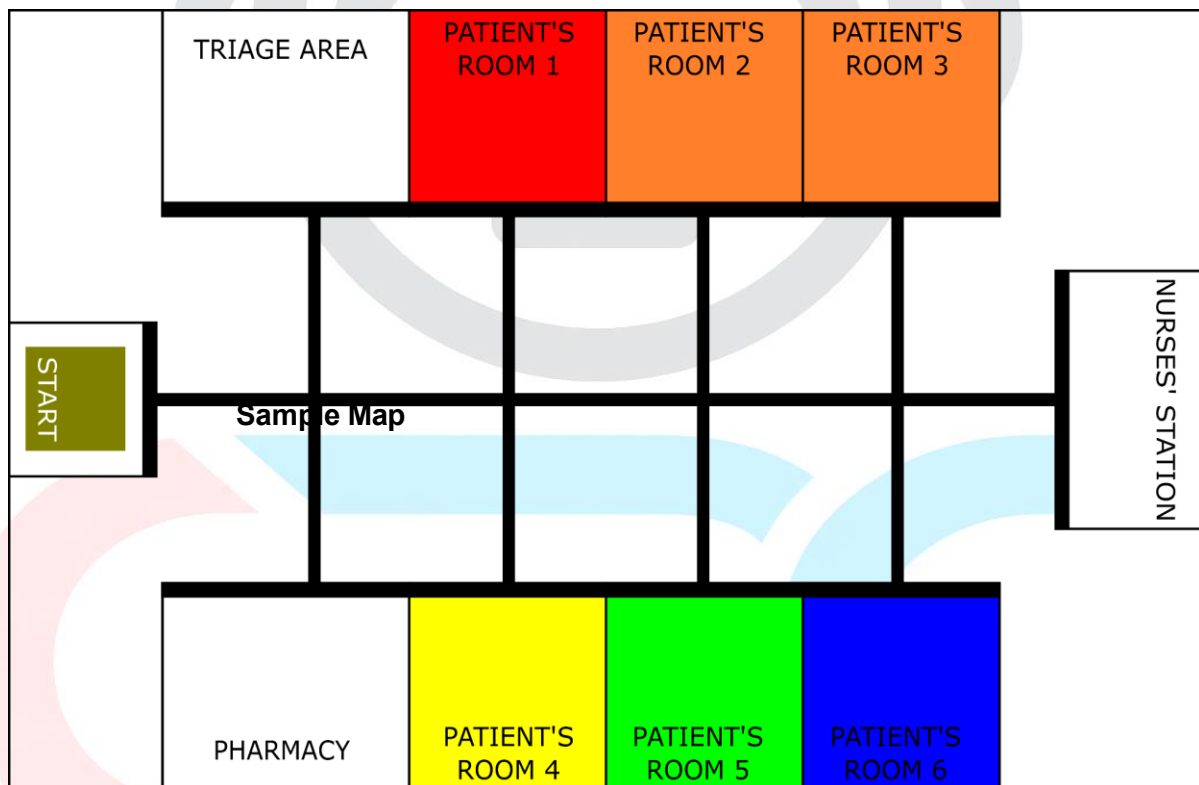
2.3. Robots will need to protect their sensors if necessary from any outside noise and interferences.

2.3.1. Teams are responsible for ensuring that their robots can operate reliably under normal competition conditions.

2.3.2. A team found intentionally causing interference with another robot or the competition environment shall have its current run terminated.

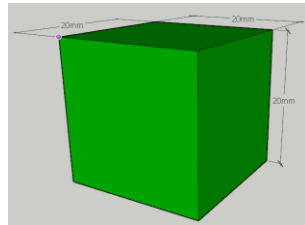
2.3.4. Repeated or deliberate violations of Rule 2.3 may result in disqualification from the competition at the discretion of the Head Referee.

3. Playing Field

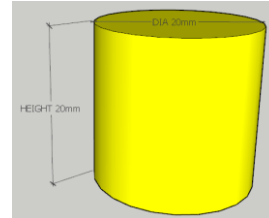


- 3.1. Size: 120 x 240cm.
- 3.2. Printed on the backside of tarpaulin (backprint, NON GLOSSY part).
- 3.3. The patient and medicine supply game pieces may be 3D-printed or fabricated from wood, paper, plastic, or similar lightweight materials. Each game piece shall have overall dimensions ranging from 3 cm × 3 cm to 5 cm × 5 cm. *(Sample patient and medicine supply illustrations are shown below for reference only. The actual shape, design, color, and appearance of the game pieces used during the competition may differ from the samples shown.)*

Sample medicine supply



Sample patient



- 3.4. Black lines
 - 3.4.1. Approximately 25mm to 30mm in width.
 - 3.4.2. Lines consist of straight, curved, intersecting and broken lines.
- 3.5. Official playing field will become available on the day of the contest

4. Robot Preparation

- 4.1. All participants must be at the designated venue when the game begins.
- 4.2. Only one robot per team is allowed for the entire game.
- 4.3. Participants will be given **60 minutes** practice and preparation time. During this time, participants are allowed to **calibrate** and **test** the robot on the official playing field.
- 4.4. The first run begins immediately after the first **60 minutes** practice run.
- 4.5. The second run begins immediately after.

5. Tasks and Missions

- 5.1. Sequences of patient and room numbers to be used will be announced on the day of the contest.

Task	Task Name	Instruction	Robot Action (line tracing mode)
1	Wake-up the robot	Place the robot inside the STARTING AREA / ROBOT STATION. The player wakes up the robot by giving a voice command "START" .	The robot must blink 3-5 LEDs for 3 times (at least 3 seconds) 0.5s ON + 0.5s OFF (3 times) ANY color of LED allowed.
2	Go to Nurse Station	The player instructs the robot to go to the nurse station by giving a voice command "GO TO THE NURSE STATION" .	The robot must move to nurse station via line tracing

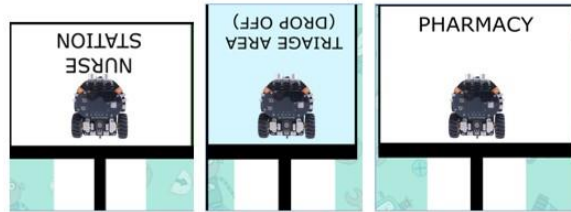
3	Check the triage / patient's waiting area	From the Nurse station, the player instructs the robot to check the triage / patient waiting by giving a voice command "CHECK THE TRIAGE" or "CHECK THE PATIENTS" .	The robot must move to the triage / patients waiting area
4	Bring the patient to patient's room	Inside the triage, the player loads the patient on the robot, then instructs the robot to bring the patient to specific rooms by giving a voice command "BRING THE PATIENT TO ROOM _" . Room # will be announced on the day of the contest.	The robot must move and bring the patient to the room assigned. Upon arrival inside the patient's assigned room, the player unloads the patient.
5	Go to Pharmacy / Medical Storage	Inside the patient's room, the player instructs the robot to go to Pharmacy by giving a voice command "GO TO PHARMACY" .	The robot must move and go to the pharmacy. Upon arrival inside the Pharmacy, the player loads the medicine manually.
6	Deliver the Medicine	Inside the Pharmacy, the player instructs the robot to bring the medicine to the patient's room assigned on task 4 by giving a voice command "DELIVER THE MEDICINE TO ROOM _" .	The robot must bring the medicine to the patient's room assigned on task 4. Upon arrival inside the patient's room, the player unloads the medicine manually.
The player must give the correct voice commands before the robot performs the action. A max of 3 rooms will be assigned on the day of the contest. To gain more scores: After task 6, players may repeat tasks 3-6 until all the patients are brought to their assigned rooms and medicines are delivered to the patients.			

6. Start of the Game

- 6.1. The player must place the whole body of the robot **INSIDE** the Starting area / Robot Station.
- 6.2. After the referee confirms that the team members are ready, the referee will issue a "START" signal. The referee starts the timer.
- 6.3. The robot must start immediately.
- 6.4. There will be 2 official runs. Each run will last for 5 minutes.
- 6.5. Players are allowed to touch the robot while it is inside the following rooms:
 - Robot Station / Starting area
 - Patients room
 - Pharmacy
 - Triage / Patients Waiting Area

7. Scoring

- 7.1. The score will be based on the number of tasks the robot completed within 5 minutes.
- 7.2. For task 2 (nurse station), 3 (triage), and 5 (pharmacy), scores will be given after the whole body of the robot enters the room completely.



- 7.3. For task 4 (patient) and 6 (medicine), scores will be given after the robot successfully delivered the patient or medicine INSIDE the Patient's Room. NO point will be given if it is delivered outside the assigned room.
- 7.4. To gain more scores: After task 6, players may repeat tasks 3-6 and until all 3 patients are brought to their assigned rooms and 3 medicines are delivered to the correct patients.
- 7.5. Bonus points
 - 7.5.1. Players are allowed to touch and turn or reposition the robot while it is inside the rooms. However, an additional **five (5) points** will be granted if no physical interaction with the robot is made, and the robot operates autonomously within the rooms. Voice commands may be used to make the robot move or turn while inside the rooms.
 - 7.5.2. An additional **five (5) points** will be granted if the robot automatically and without voice instruction instructs the player to unload the patient or medicine. This robot instruction will be communicated through the following:
 - A blinking red and blue LED for **0.5sec** per color (repeat 3x).
The instructions / message (like LED, sound, or LCD display) must be turned off before leaving the room.
- 7.6. In the case of a TIE, **the robot with the best 2nd run wins.**

8. End of the Game

- 8.1. When the player touches the robot while it is outside the room tracing the line.
- 8.2. When the robot goes off track, or performs the tasks NOT in sequence.



- 8.3. The game ends if the robot cannot continue or cannot finish the task.
- 8.4. The game ends if the patient or the medicine was dropped outside the room while it is running.
- 8.5. When 5 minutes have lapsed.

SAMPLE SCORESHEET

Name of School	Name of Players	Game ID	Age Category



FIRST RUN



SECOND RUN

Task	Command	Score (10 pts each)	Bonus (5 pts)	
			No Touch Must successfully leave the room	Blink red & blue Must unload after 3 second blinking
1st Room				
1	Start	10	n/a	n/a
2	Go to the Nurse Station	10	5	n/a
3	Check the Triage	10	5	n/a
4	Bring the Patient to room	10	n/a	5
5	Go to Pharmacy	10	5	n/a
6	Bring the medicine the room	10	n/a	5
2nd Room				
3	Check the Triage	10	5	n/a
4	Bring the Patient to room	10	n/a	5
5	Go to Pharmacy	10	5	n/a
6	Bring the medicine the room	10	n/a	5
3rd Room				
3	Check the Triage	10	5	n/a
4	Bring the Patient to room	10	n/a	5
5	Go to Pharmacy	10	5	n/a
6	Bring the medicine the room	10	n/a	5
TOTAL = 205 points		140	35	30

TOTAL SCORE: _____

TIME(in seconds): _____

PLAYER'S SIGNATURE: _____

REFEREE'S SIGNATURE: _____