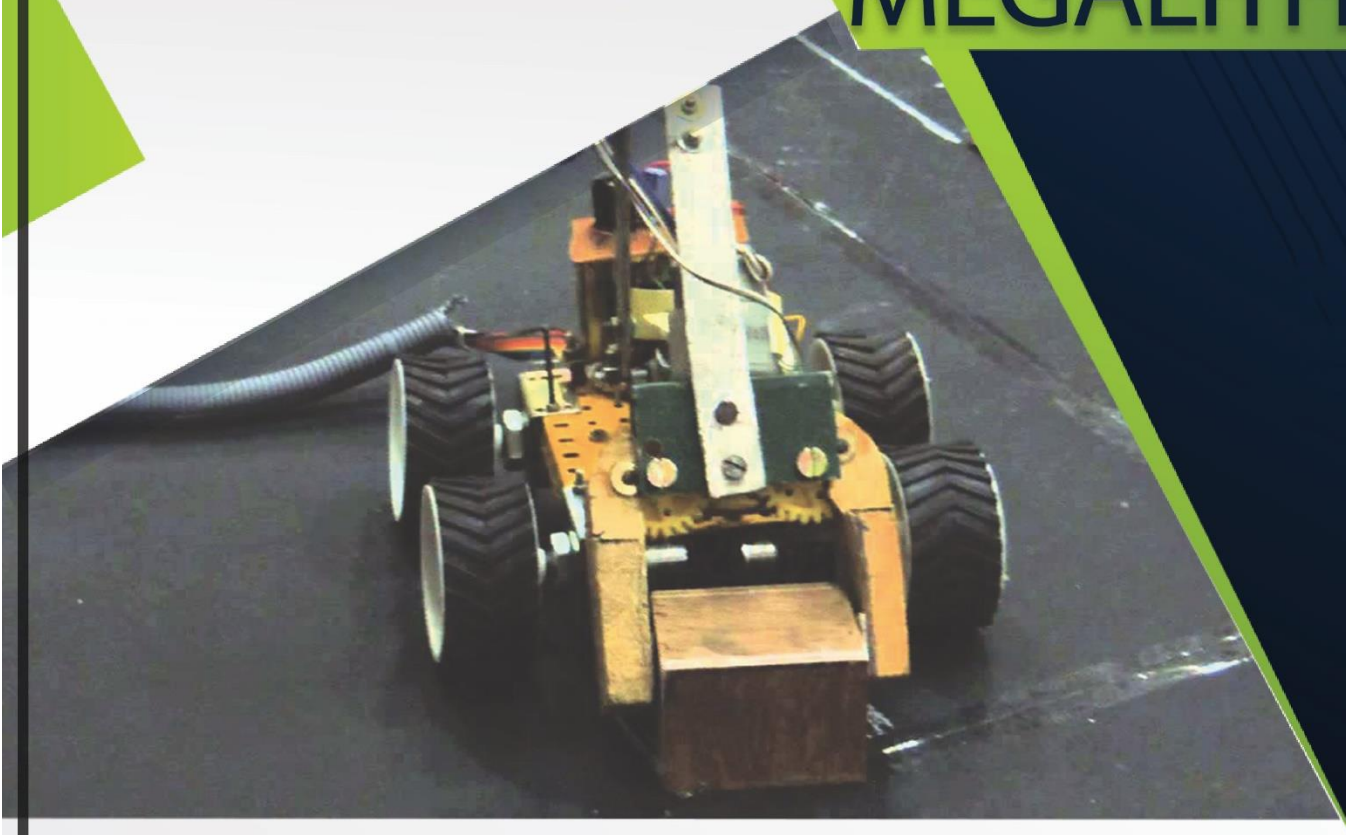
megalith
DEPARTMENT OF CIVIL ENGINEERING

INDIAN INSTITUTE OF TECHNOLOGY
KHARAGPUR

MEGALITH



CIVIONICS

INTRODUCTION

Nowadays construction automation is a well-accepted phenomenon in many developed countries. The range of construction automation is broad and covers all stages of construction from the preparation of construction materials to the operation and maintenance of projects. The use of construction automation method makes the construction process continuous as it tackles with the problem like shortage of skilled labour, poor weather condition. The base of the method is hydraulic machines.

PROBLEM STATEMENT

Design and fabricate a locomotive, mobile syringe actuated mechanical bot, capable of lifting wooden blocks which are of distinct colour and arrange them in the shape provided. The hydraulic arm has to pick the relevant block from the arena and place it in the assigned area.

TASK

1. The bot will start from the starting area.

2.The robot should pick the block from the boundary of the arena where all coloured blocks are randomly laid and make the structure as shown in the diagram.

Specifications for the bot

1. The dimensions of the base of the bot should not exceed 30 cm x 30 cm. However, there is no restraint on the height and weight of the bot.

2. The bot should function only on hydraulic forces except for the locomotion for which electronic components may be used (It can be wired or not - wired).

3. The participants will only be provided with 220 volts, 50 Hz standard AC supply, to be used only for the locomotion of bot. Participants will themselves have to arrange for any other power supply required for their robot

Scoring:

Points awarded=30*C1+30*C2+40*L1+30*L2+20*L3+10*L4-R*25-T*50-F*20

C1- First column

C2-Second column

L1-First layer just above the column

L2-Second layer (above the first layer)

L3-Third layer (above the second layer)

L4-Fourth layer (above the third layer)

R-No of restarts

T-No. of timeouts

F-No of fouls (any violation of the above rules will be considered as foul)

Specific Rules:

1. Each column and layers should have assigned number of blocks

2. Dimension of the block is 4cm*4cm*4cm

3. Only after completing the columns, participants can move forward to build the layers.

4. The blocks can be disturbed without making them cross the boundary line specified in the arena. There shall be no penalty in such case.

5. Each team can only have 2 timeouts in the entire session.

6. Each team can have a maximum of 1 restart which will be permitted only if asked before making any layer.

7. If the bot topples, the participants can place it back in the correct position and continue the task. There will not be any penalty for this, although the time will keep running during this course.

8. In case of a tie, extra time of 5 minutes will be given. The team with maximum points will be declared the winner.

9.Maximum time for the completion of the task is 10 minutes. No extra time would be given.

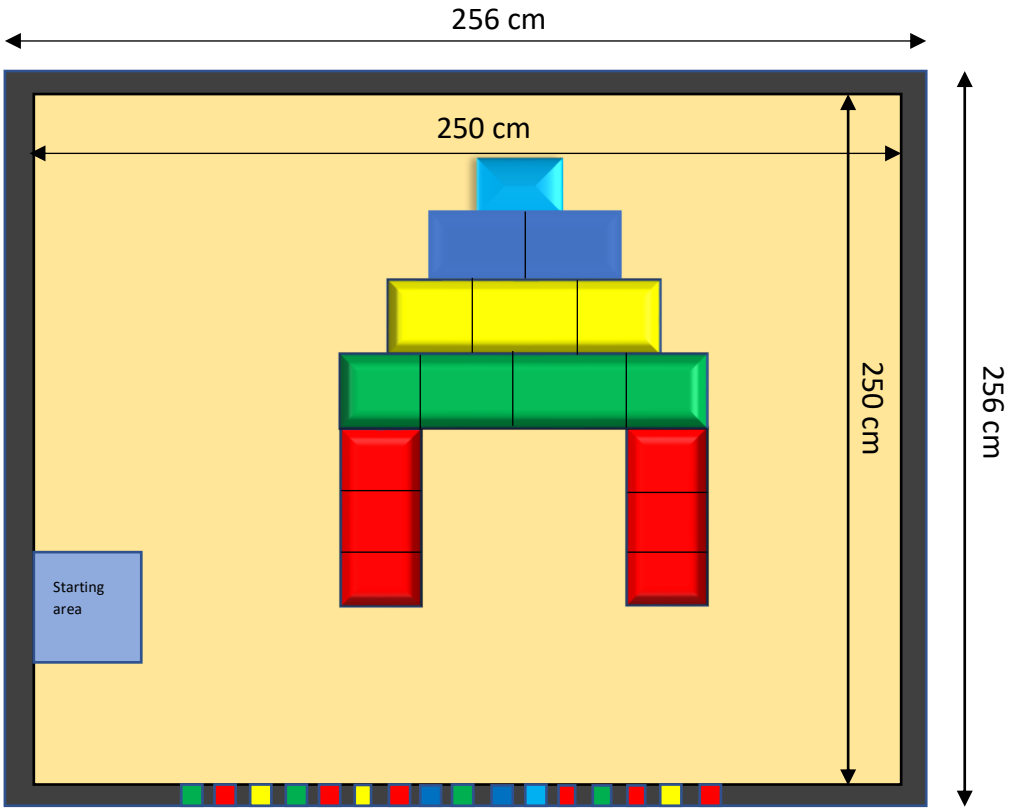
RULES AND REGULATION

1. The number of participants in the team must be 3 to 5

2. Each team shall have only one robot.

3. In case of any technical problem, the teams will be allowed to make modifications to their robot and in such a case, the teams will be penalized in the second attempt of 10% of their total score.

4. The teams cannot tinker with their robot in the arena.



NOTE: The structure is a planar structure. You need not to place the blocks one above another.

Wooden block: 4cm* 4cm* 4cm

Inner boundary of arena :250cm*250cm

Outer boundary of arena:256cm*256cm

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