RUBE GOLDBERG

Pool Event   **Points: 40**

RUBE GOLDBERG

A Rube Goldberg machine is a deliberately over-engineered machine that performs a very simple task in a very complex fashion, usually including a chain reaction. The machine is named after American cartoonist and inventor Rube Goldberg.

Problem Statement:
The final step is to hit an arrow using a bow-arrow set on a board placed at some distance. The board will have concentric rings with inner-most diameter of 15cm, then 30cm, 50cm and 75cm successively. The board should be perpendicular to the direction of arrow and the normal to the ground/floor, and can be kept at any distance greater than equal to 1 meter from the tip of arrow.

Rules & regulations

- The machine must complete the task as described in the challenge. If not, points kept for the same would be deducted.

- The machine must be no larger than 12 ft. x 12 ft. x 10 ft. The support from only one wall is allowed (you can use windows if present on that wall) and the top ceiling is not allowed of any form.

- The machine must have a minimum of 10 steps if the machine has less than 10 steps the respective pool would be disqualified from the competition.

- Only one member from the team is supposed to explain their machine before the demonstration.

- The machine will have a 15 minute reset time if they go for more than one run.

- Only one team member may interact with the machine once the evaluation has begun. This includes resetting the machine during the run. This means that only one person will be inside the arena. However if the team goes for another run the restriction of one person inside the arena is uplifted until the machine is ready for the other run.

- Any loose or flying objects must remain within the set boundaries of the machine. This includes, but is not limited to, drops of water, slivers of balloon, and other "small" objects. Steam and other gases are exempt from this rule. However for the sole purpose of electrical connection wires can be outside the boundaries of the machine.

- Each team is supposed to submit a copy of a step-by-step description of their machine. Diagrams and pictures have to be included in this description along with the typed information. If any team fails to submit the copy of the abstract then they will automatically be disqualified from the event. Team is encouraged to submit a video of the running of machine along with the written copy of description. Bonus 5 points would be awarded for the same.

  - A step in the machine should be considered a transfer in energy from one action to another action. Identical transfers of energy in secession should be considered one step.

For e.g., a set of dominos falling into each other should be considered one step. While technically each single domino falling is a step, stating one hundred steps because of the dominos is repetitive and not in the spirit of Rube Goldberg.

- The task should be completed in not more than 200 seconds time.
- Every team will be given maximum three runs for the completion of the task and if in case a team is not able to complete the task in their first run and they can go for second run.
- For every human intervention the points will be deducted.
- Any destructive action against another machine is grounds for disqualification.
- Programmable Logic Controllers or any other electronic controller/devices may be used on the machines. The use of these devices must be in line with a step. Using these devices as a fail-safe for the machine is illegal and grounds for disqualification.
- Let's say a ball is supposed to fall onto a switch and turn on a motor which is run by the controller.
- If the ball misses the switch, but the controller still starts the motor, the controller is not transferring energy from one step to the next step. It is acting as failsafe so the machine can finish and not in line with definition of a step.
- If the ball hits the switch and the controller starts the motor as it should, the device is merely transferring the energy from one step to another, so this is line with the definition of a step.

- If a controller/electronic device is used, each instance of its operation should be clearly stated in the step-by-step description submitted along with the written description.
- Each instance should be considered one step, but please supply detailed information of how the step is being accomplished.

Point Structure

Theme and Descriptions of each task involved.	10 points
Completion of task	P: Score based on zone hit by arrow. • 20 points (15dia. Circle) • 12 points (30dia. Circle) • 6 points (50dia. Circle) • 2 point (75dia. Circle) D: Perpendicular distance from the tip of arrow and board. Score calculation = D*P Arrow must remain intact, else if the arrow falls down from the board, score becomes 0.5*D*P
Innovation and Complexity in steps.	20 points
No. of steps	• 1 point for each sequential step after 12 steps. • 3 points for each Parallel step (a step is considered to be parallel if it triggers chain reactions in 2 or more different chains and they finally merge into a single chain of events)
Aesthetics	10 points
Bonus points for video submission	5 points (if submitted) 0 points (if not submitted)
Abstract Submission	10 points

Penalties

Run length exceeded	-1 points/10 seconds
Human Interventions	First intervention -3 points Further intervention -5 points each
Objects leaving arena	-3 points each (The target board is part of arena, hence, if arrow misses the target completely it will fall under this case)
Delay in submission	-1 point for each 10 min. delay Disqualification for delay more than 90 minutes.
Inaccurate diameter length on target board	Straight away disqualification

Deadlines

Submission of the detailed description of the machine along with the video: 10:00 AM 6th September to takneek2015@gmail.com.

Submission of the key of the room: 10:00 AM 6th September to the event coordinator.

Exceeding with the submission deadlines would call for a penalty of 1 point for each 10 minutes of delay. Also if delayed by 1.30 hours team would be disqualified.

Judging

The judging of the event will take place from 2:00 to 6:00 PM 6th September.

NOTE The use of animals or fire is strictly prohibited and may lead to direct disqualification.

Contacts: Shubham Jain   spjain@iitk.ac.in   9987097414