TECHFEST

Techfest is a festival of technology. It is a platform for techies to showcase their skills through interesting events. This year **Choithram School** brings you exciting events for the talented to showcase their talents and win what they deserve.

Trace to Base

The CAD competition challenges participants to apply their skills in **computer-aided design (CAD)**, which is widely used in engineering and architecture to create precise models. This competition is designed to be easy, simple, and fun for everyone! Whether you're a beginner or an expert, you'll find that the tasks are approachable and enjoyable. Competitors begin in paired matches, tasked with recreating a 3D model from an image using CAD software. Winners advance to subsequent rounds, with the final two participants modeling a physical object, and the most accurate **3D model** determines the champion.

Event Overview:

- Venue: School Language Lab.
- Participation in Teams of 2 members.
- Software: Onshape (https://www.onshape.com/en/)

Eligibility:

- Students from Grades 6-12.
- Basic knowledge of CAD software (Onshape) is required.

Event Format:

- **Initial Round:**

  In this Round, participants are paired up and compete against each other. Each participant is given a 2D image of an object and tasked with recreating it as a 3D model using Onshape. The key criteria for evaluation are accuracy and attention to detail. The

winner of each pair advances to the next round.

- **Advance Rounds:**

  In these Rounds, winners from the initial round face off in pairs once again. Each participant is provided with a new image of an object, which they must recreate in 3D. The objects in this round may be more complex to test participants' advanced modeling skills. The key criteria for evaluation are accuracy and attention to detail. These criteria determine the winner of each pair and advance to the next stage, progressively reducing the pool of competitors for the final round.

- **Final Round:**

  In the Final Round, the finalists will compete head-to-head in a showdown to determine the overall winner. Instead of working from an image, they are provided with a physical object that they must carefully analyse and recreate as a digital model using OnShape. Vernier calipers will be provided for participants to measure the object and hence create with accuracy. The final models are judged on multiple factors, including accuracy, level of detail, and effective use of CAD tools. Precision in translating the physical form into a digital space will be key. The participant who creates the most accurate and well-executed 3D model will be crowned the winner of the competition.

● Rules & Regulations

- Each participant/team must use only the designated CAD software.
- No external references (internet, books) allowed.
- Designs must be submitted within the given time frame.
- Late submissions will not be accepted.
- External plugins/automation tools are prohibited.
- Cheating or plagiarism will result in disqualification.
- Internet access will be provided.
- Participants are not allowed to use their own devices for designing, they will have to use the PCs provided by us.

The school will provide:

• Physical objects for the final round.
• PCs with the necessary CAD software.
• Vernier calliper will be provided for the final round.

Judging Criteria:
Technical Accuracy and Speed of Modelling

Sample for Round 1 & 2:
(https://drive.google.com/drive/folders/1iIS6EzEr_1DyCZL1Lgv6prJEiTQCmIUW?usp=drive_link)

Gladiators of the Singularity

Event Summary: Two robots compete in a head-to-head match following the basic system of traditional human sumo matches. Robots are allowed no weapons and are not allowed to flip each other. The sole purpose is a pushing match between the two robots to force the other from the arena.

Eligibility: Classes 6th - 12th

RULES:

Section 1: Team formation

A team can have a maximum of 4 members. Participants may also participate individually but must represent their school.

Note: Only one member shall be allowed to control the robot in a single match. The whole match will be carried out by that controlling team member. (However, you may change the controlling team member in a different match.)

Section 2: Robot requirements and restrictions

Size of robot - must not exceed 18 x 18 cm (length x width) and 15 cm in height.
Weight of robot - must not exceed 3kg.
Control - robots will be controlled manually through either wired controllers or wirelessly over radio, bluetooth, or wifi. NOTE: Robots cannot be controlled autonomously.
Voltage - Voltage across the robot at any point must not exceed 12v.
Material - Robots can be made with any material as long as they stay under the weight limit.

Power supply may either be on-board or off-board.
Sticky substances to improve traction are not allowed. Tires and other components of the robot in contact with the ring must not be able to pick up and hold a standard 3 x 5 inch index card for more than two seconds.

Parts that could break or damage the ring are not allowed. Do not use parts that are intended to damage the opponent's robot or its operator. Normal pushes and bangs are not considered intent to damage.

Devices to increase down force, such as a vacuum pump or magnets, are not allowed.

Edges must not be sharp enough to scratch or damage the ring, other robots, or players. Judges may require edges that they deem too sharp to be covered with a piece of tape.

Devices that throw things at your opponent are not allowed.

Devices that can store liquid, powder, gas or other substances for throwing at the opponent are not allowed.

Pre-built robots or configurable kits - Robots must be constructed by the participating team from scratch. While LEGO kits are allowed, use of pre-built or purchased robots will lead to disqualification.

Section 3: Conduction of match

One match shall consist of 3 rounds, within a total time of 3 minutes.
Note: The following are not included in the time of the Match: (i) The time elapsed after the judge announces a point and before the match resumes.
(ii) The time elapsed after a judge announces to stop the match and before the match resumes.

The team which wins two rounds or receives two points first, within the

time limit, shall win the match. A team receives a point when they win a round. If the time limit is reached before one team can get two points, and one of the teams has received one point, the team with one point shall win.

When the match is not won by either team within the time limit, an extended match of 2 minutes will be fought, during which the team which receives the first point shall win.

One point shall be given to the team who’s robot forces the opponent out of the arena upon the judges' decision.

Section 4: Scoring of points

One point shall be given when:

1. A team legally forces the body of the opposing robot to touch the space outside the ring, which includes the side of the ring itself.

2. A point is also given in the following cases:
The opposing robot has touched the space outside the ring on its own.
Either of the above takes place at the same time that the end of the Match is announced.

3. When a wheeled robot has fallen over on the ring or in similar conditions, the point will not be counted and the match continues.

4. The match shall be stopped and robots will be reset under the following conditions:

The robots are entangled or orbiting each other with no perceivable progress for five seconds. If it is unclear whether progress is being made or not, the judge can extend the time limit for observable progress for up to 30 seconds.

Both robots move, without making progress, or stop (at the exact same

time) and stay stopped for five seconds without touching each other. However, if one robot stops its movement first, after five seconds it will be declared as not having the will to fight. In this case the opponent shall
receive a point, even if the opponent also stops. If both robots are moving and it isn't clear if progress is being made or not, the judge can extend the time limit up to 30 seconds.

If both robots touch the outside of the ring at about the same time, and it can not be determined which touched first, a reset is called.

Section 5: Sumo Ring

The sumo ring's dimensions are for a standard mini/kit sumo ring -
Diameter - 100 cm
Height - 2.5 cm

The sumo ring will have 2 lines parallel to each other. The bots must be placed behind each of these lines. Following are the dimensions for the lines:
Width - 1 cm
Length - 10 cm
Separation - 10 cm

Finally, the sumo ring consists of an outer border of width 2.5 cm.

Section 6: Matchmaking

The teams will start by playing a league round - each team competes against every other team. The teams will be scored in the following way:

Loss - 0 points awarded
Draw - 50 points awarded
Win - 150 points awarded
At the end of the league round, the top four teams with the maximum points will be moved to the semi-finals. In case of a tie, the head-to-head score will decide which team is eliminated. In a case that the head-to-head score is also equal, a tiebreaker round will be conducted.

For the finals and semifinals - maximum time will be extended to 5 minutes, and the match will be a best of 5 rounds (first to 3 points wins). If the score is equal at the end of the 5 minutes, the time shall be extended and the first to get a point in this duration wins.

SuperNova Showdown

Event Overview - Step into competitive gaming with The Ultimate Gaming Championship! Show off your strategy, teamwork, and skill in a series of Valorant matches designed to push your limits. Whether you're a seasoned player or just starting, this tournament promises an exciting blend of competition and fun. The event consists of several stages, each with unique challenges, leading to the grand finale where one team emerges as the champion.

Eligibility –
Students Of classes 9-12 Are eligible to participate.

Riot ID Verification: All participants must have a verified Riot ID to compete. A team must have a minimum of 5 members and 1 substitute.

RULES:

1. Teams will compete in a series of Valorant matches. 2. Players may bring their keyboards and mice, but you will be provided with them at the venue as well.
3. The exact format of the event will be revealed on the event day itself.

AstroCode

AstroCode is a dynamic competition designed to challenge students in their Python programming skills, problem-solving abilities, and teamwork. Participants will engage in two exciting rounds, showcasing their knowledge of Python fundamentals and applying their skills in a practical project involving GUI application development using GUI libraries offered by Python such as PyQt or Tkinter.

RULES:

1. Python is to be used for both rounds.
2. Each team must consist of 1-2 members
3. Team members must belong to grades 8-12
4. Teams are prohibited from bringing laptops, mobile devices, notebooks, paper, etc., into the challenge room. Paper for rough work will be provided to the participants.
5. Internet access will be provided during the second round.
6. Use of the internet other than to access the quiz is strictly prohibited during the first round.

Provision and Requirement

1. Wifi will be provided throughout the competition.
2. School PCs having Tkinter and PyQt installed are to be used.
3. Each team is required to have an email id that can be used to open the quiz.

Grounds for Disqualification

1. Plagiarism
2. Exceeding time limit.
3. Use of any library other than Tkinter or PyQt.
4. Unauthorized use of the internet during the first round.

Rounds Overview

Round 1 : QUIZ

The first round will consist of a timed multiple choice quiz conducted

through google forms.
Time allotted: 20 minutes

Concepts tested: Python fundamentals such as basic data structures, loops, conditional statements etc.

All teams will be promoted to the second round regardless of their performance in the first.
Performance in the quiz will be taken into account when calculating the final result.

Round 2 : GUI App Development

During the second round, teams will be asked to create a GUI application as described during the challenge using ONLY PyQt or Tkinter library.
Time allotted : 1 hour 30 minutes.
Code Editor : IDLE

Judgment and Scoring

- 40% for correct execution
- 30% for functionality
- 20% for creativity and UI design
- 10% for conciseness of code

Judgment for the app will be made on the basis of features, functionality, UI design and code quality.
Final winners will be declared on the basis of the sum of their marks in the first and second round.

Navigators of the Nebulae

Overview - This is a robotic competition where teams design and program autonomous bots to follow a track. The goal for each bot is to follow the line accurately and quickly from start to finish with covering all the checkpoints. Participants will compete against each other to see who can design the most accurate and efficient bot. The bot will work autonomously without any human intervention.

Team Info:

A team can consist of a maximum of 4 members. Each team must declare a name for their team.
Participation Criteria - Classes 6th - 12th.
Note - You have to bring your own tools/materials no tools will be provided and keep an extension with you for charging the batteries.

Problem Statement - Design and build an autonomous vehicle that can quickly and accurately follow black lines on a white floor. The vehicle will be tested on how fast it can complete the course and accuracy of the path following.

Robot Specifications:

The robot must be able to fit inside a 25cm(length) x 20cm(width) x 15cm(height) box and it should weigh less than 2 kgs.
Any wired/wireless control is not allowed.
There should be no human intervention at any cost if so then the team might be disqualified.
The boot should have an onboard power supply which should be less than 12 volts.
The bot should not damage the arena by any means.

Rounds Overview:-

The team which completes the track with the fastest time and all the checkpoints covered without any deviation will be given preference.
Teams will compete and top teams will be selected for the next

round.
The judgment will be on the basis overall time and checkpoints covered.

Game Rules:

The robot must start from the starting line and follow the designated track to the finish line. Teams will have 1 minute to set up before their run begins.
If the robot deviates from the track, team members can reposition it at the last checkpoint and restart (Note: The timer will continue running). This can only be done two times per run.
The timer stops as soon as the robot crosses the finish line. If a technical issue arises, teams may declare a "technical fault" to fix the robot (Note: This can be done once per run, and the timer will not pause).

Arena:

There will be two arenas, one for practice and another will be the final track. The arena will consist of a black line on a white floor. And the width of the black line will be 2 cm. The track will have smooth curves, right angle sharp turns and junctions(there will be no turns less than 90`). The entire arena will be conveniently situated in a uniformly lit room to minimize ambient light. If you want, you will be given access to change the light in the room.

Disqualification:

The robot must not be purchased and should not be made from any ready-made kit, if found so, the team will be disqualified. It is expected by all teams to play a clean and fair game. Misbehaving teams and participants will be asked to leave the competition area and risk being disqualified from the contest. The call by the judges will be last and final no changes will be done if a team does not agree with the decision of the judge it will be removed from the contest.

Judgement Criteria:-

Time covered will be the main criteria of judgement in both the rounds. There will be checkpoints at most turns of the arena and by covering those checkpoints the marks will be allotted. If the bot deviates from

the
track it will be kept at the last checkpoint it covered before the completion of the track.

Galactic Grand Prix

1. Event Overview:

The Robot Racing event challenges teams to design, build, and race robots on a dynamic track filled with obstacles The competition is divided into multiple rounds where the goal is to complete the racecourse as fast as possible Teams will need to demonstrate both speed and precision, as well as adaptability to varying challenges The final showdown will test not only the robots speed but also the teams coordination in a relay style race

2. Rules:

- Robot Specifications:
  - ○ Remote controlled robot, only wireless bot is permitted. ○ Maximum dimensions: **200mm (length) x 200mm (width) x 100mm (height)**
  - ○ Maximum weight: **5 Kg**
  - ○ Battery: Robots must use a **12-volt battery**.
- Course Navigation:
  - ○ Each team will have a **3:00 min time limit** to complete the course.
  - ○ Robots must pass through all **checkpoint**s and obstacles to be eligible for a win.
  - ○ In case the robot leaves track boundaries, the robot will start from its latest check point.
- Penalties:
  - ○ **Track Exiting**: If the robot leaves the track more than twice during a race, it will receive a **5-second time penalty** per occurrence after the second time..
  - ○ **Manual Help**: If a team manually intervenes to help or adjust their robot during the race (such as placing it back on track or making physical adjustments), **3 seconds will be added** to their race time for each occurrence.
- Team Conduct:
  - ○ Teams must arrive before time for their scheduled race slots.

- Disqualification Conditions:
    - Tampering with another team's robot or controller.
    - Exceeding the size, weight, or battery limits.
    - Persistent misconduct or violations of event rules.
    - Unsportsmanlike behaviour will result in disqualification.

3. Eligibility Criteria:

- Teams must consist of **minimum 2** and **maximum 3 participants**.
- All participants must be from grades **6th to 12th**.
- Only one robot per team is allowed.
- Robots must adhere to the event specifications

4. Expected Items:
- Participants must bring:
    - Their own robot and remote controller
    - Any spare parts for the robot
    - Personal laptops (if needed for programming or controls)

5. Event Rounds Details:
- ***Round 1: Time Trials***
    - Objective: Teams will compete individually.Each team will be allowed one attempt to race their robot through the entire track as fast as possible. The time taken to complete the track will be recorded.
    - How it Works: The round begins with the first team, and robots are timed from the moment they start until they cross the finish line. Teams must complete the course in one continuous motion; any stoppages or manual interventions will result in penalties. The teams with the fastest times will proceed to Round 2
- ***Round 2: Knockout Race***
    - Objective: The top 8 teams will race head-to-head on the same track. Both robots will be positioned at the starting line, and the race begins simultaneously for both teams.

    - How it Works: The race will be a direct competition. Teams must navigate their robots through the course without interference, and the first robot to cross the finish line wins. During this round, if a robot goes off the track or stops, penalties will apply for any manual help (3-second penalty per instance).
- ***Round 3: Team Relay***
    - Objective: In this final round, top 2 teams will race in a relay-style event where one team member must hand over the controller to another member after each lap through the race.
    - How it Works: The race begins with one team member controlling the robot. At a designated point on the track (One complete Lap), the controller must be handed to the second team member, who will continue the race. The team to complete the track first will be declared the winner.
    - **Note- Time will keep on running during the exchange of controllers.**

6. Other Information:
    - Teams should ensure their robots are fully functional before arriving at the venue. A techcheck will not be provided ● Participants are encouraged to arrive 30 minutes early for any preparations or clarifications
    - Track Description—
        - The track will consist of ramps, sharp turns and a curved ramp on the race course
        - 3 to 4 checkpoints will be given at random places.

7. Judgement Criteria:

    - Time - Fastest lap times with minimal penalties.
    - Completion of Race

Good luck, and may the fastest robot win!!