TUFT
(EV Formula Car Racing)

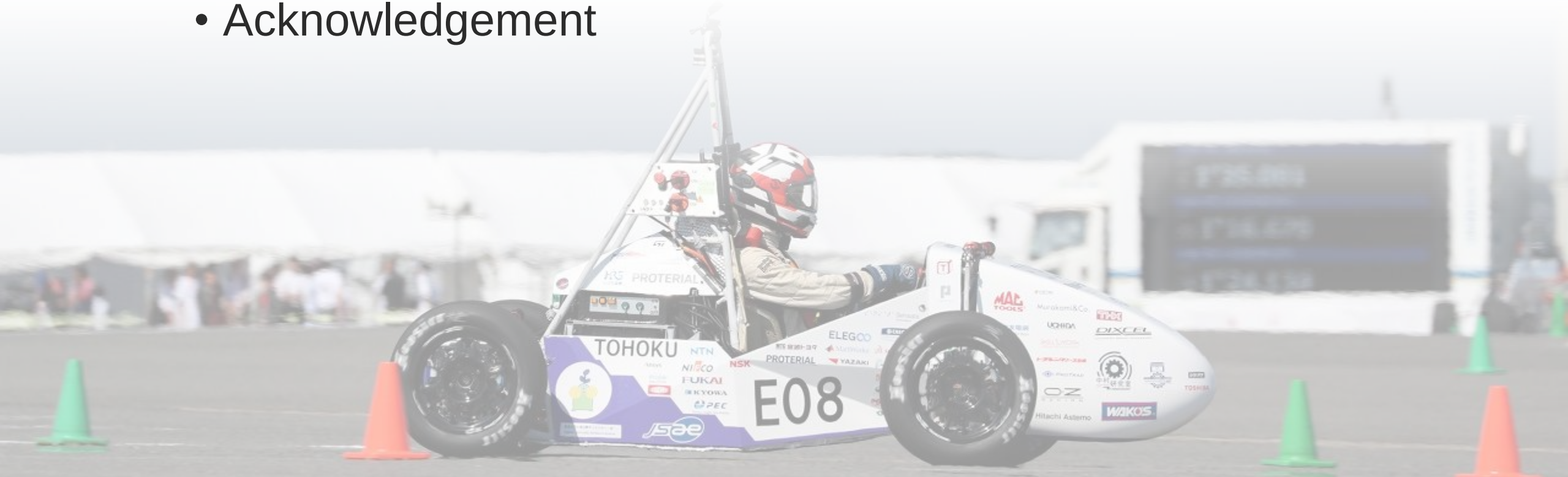
2023-2024 Activity Report

2025/2/20

2023-2024 Project Leader
Shoya Sawano
Member
Shuhei Niwano

Today's Flow

- Overview (competition, team)
- Objectives and concepts
- Activities
- Conclusion
- Acknowledgement



What is Formula Student?

Purpose of the Competition

To develop human resources that, through the support of government, industry, and academia, will contribute to the development and promotion of both automobile technology and industry

Outline of the Competition

A competition in which students compete with vehicles that they have conceived, designed, and built themselves.

Around 80 teams participate from Japan and abroad with the cooperation of nearly 250 companies, which includes major automobile manufacturers.

Formula SAE Japan 2024
Date: 2024 Sep 9~14
Venue: Aichi Sky Expo

Photo by JSAE

FORMULA SAE
JAPAN
JSAE

We are developing EV formula racing car

Team concept:

Grow as engineers

Founding	2011
First competition	2013
Best result (EV)	3rd (2017, 2021)
Best result (Overall)	27th (2021)
Members	20

Competition Details

- Required Documents and Vehicle Inspections
  - Competitors must prepare and submit necessary documents, and pass technical inspection.

- Static Events
  - Design
  - Presentation
  - Cost review

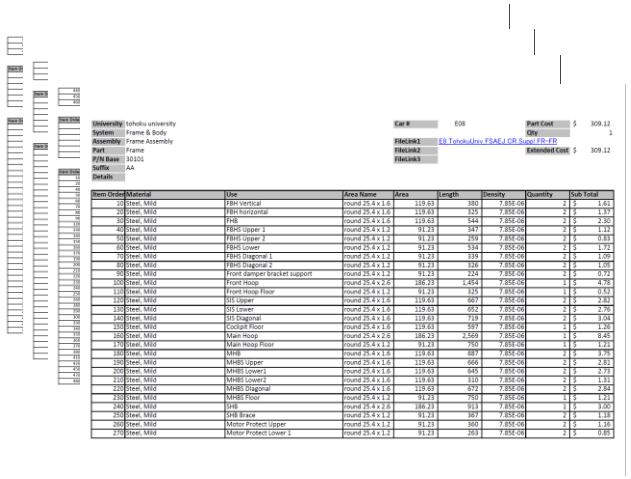
- Dynamic Events
  - Acceleration
  - Skidpad
  - Autocross
  - Endurance
  - Efficiency

Photo by JSAE

Photo by JSAE

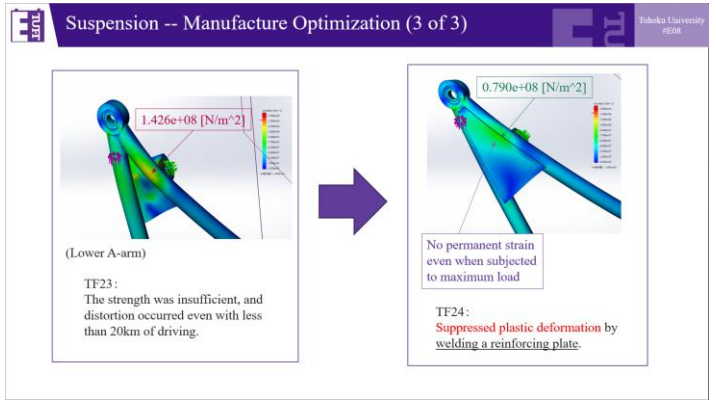
Competition Details

Static Events



Cost Event 100pt

Evaluate
- Cost report accuracy
- Problem-solving skill



Design Event 150pt

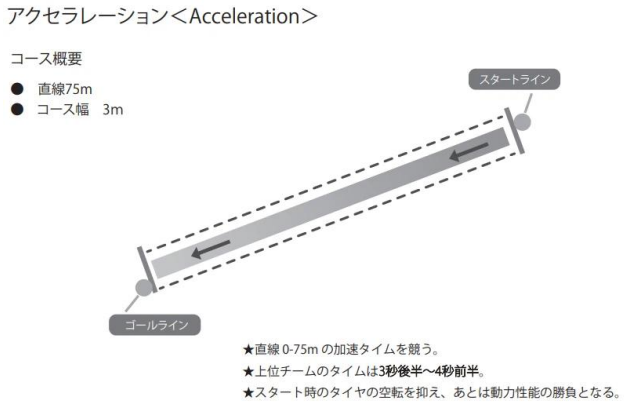
Evaluate
- Technology choice
- innovation

Presentation Event 150pt

Evaluate
- Business plan based on concept

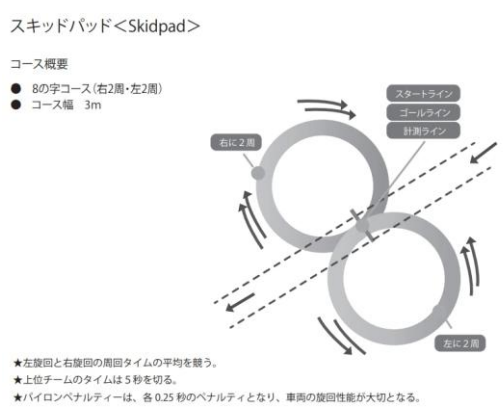
Competition Details

Dynamic Events



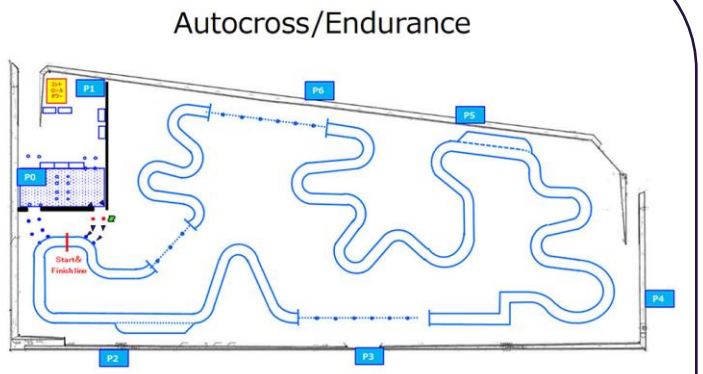
Acceleration 100pt

Accelerating from 0 to 75 meters in a straight line



Skid Pad 75pt

Run figure-of-eight course
Evaluate turning ability



Autocross 125pt
1 Lap time

Endurance 275pt
Complete 20km

Enter all events, complete the endurance event

TF24 Machine Concept

TF-24

Perfect Foundation

Create a foundation for the machine as well as the team

Machine’s foundation:

- Gain understanding of evaluation methods
- Obtain data

Team foundation:

- Team management
- Sponsporship
- Way of thinking

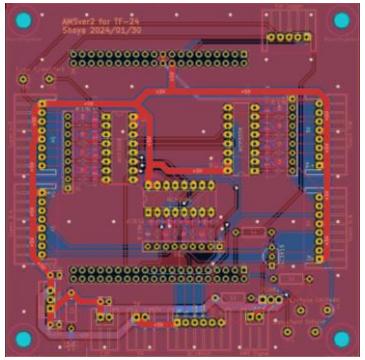
TF24 Design

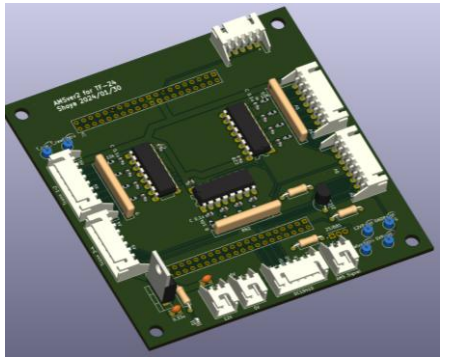
Reusing frame

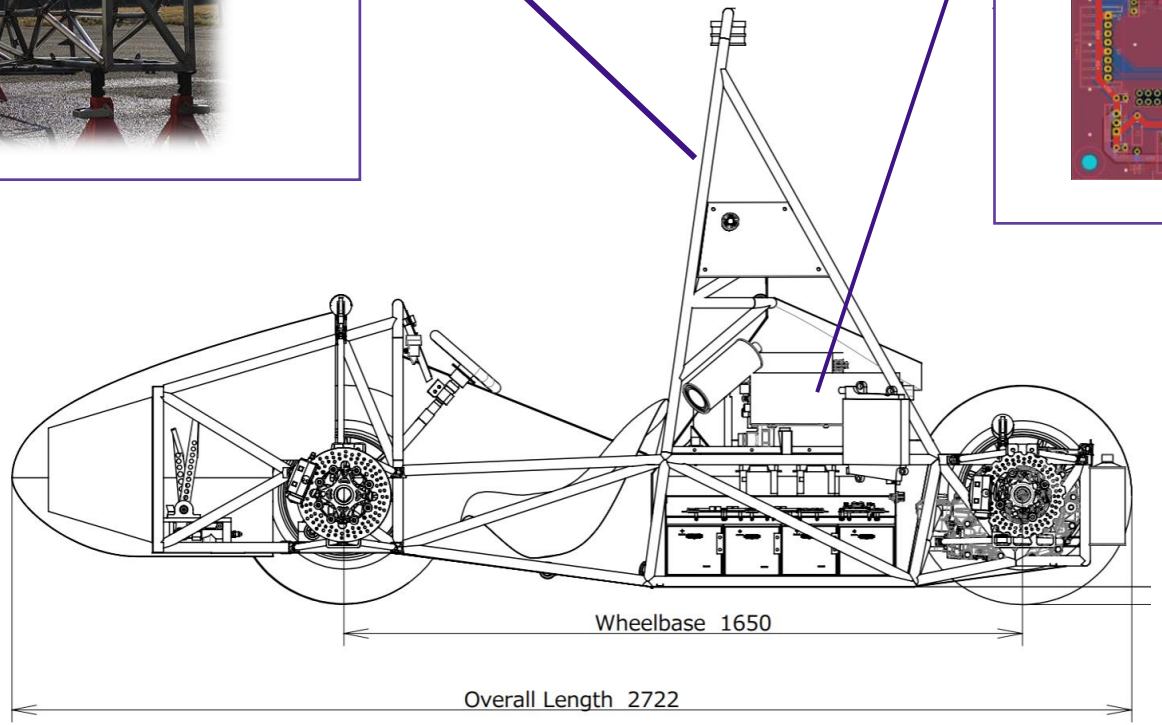
Local rule allows for EV machines to use a frame for 2 years
→Cut down production time

Electrical system

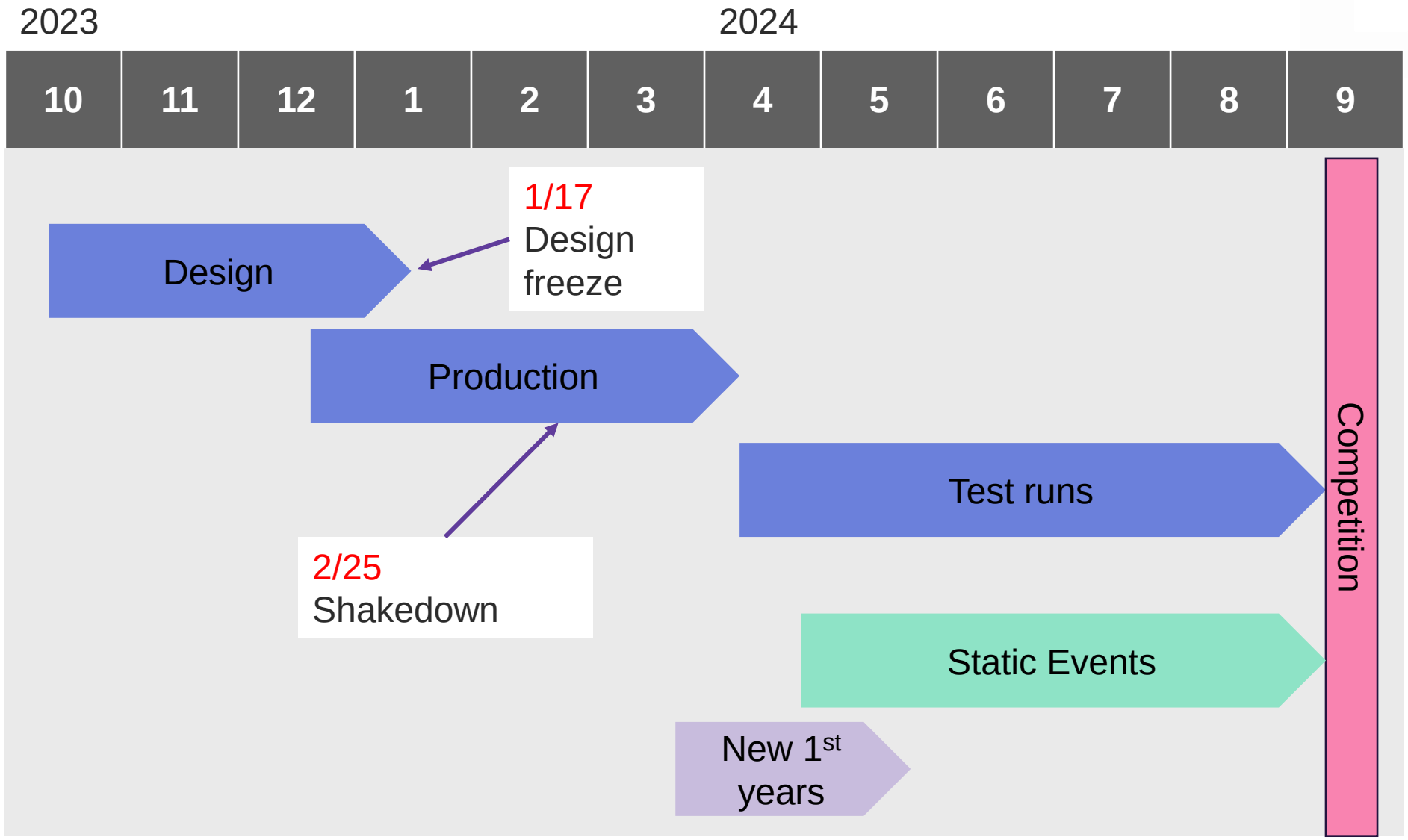
Remake the defective print circuit board
Improve the safety of the battery management system
→Improve reliability







Schedule


2023
2024
10
11
12
1
2
3
4
5
6
7
8
9
Design
1/17
Design
freeze
Production
2/25
Shakedown
Test runs
Competition
Static Events
New 1st
years

Test Runs

Test Runs: 10

Test distance Over 200 km

Most in TUFT history

Competition Results

Event	Points	Ranking
Presentation	27.19/75	63rd
Design	54/150	42nd
Cost	26.9/100	35th
Acceleration	4.50/100	33rd
Skidpad	33.36/75	25th
Autocross	54.84/125	34th
Endurance	88.74/275	24th
Efficiency	47.51/100	5th
Penalty	0	
Total	335.04/900	29th/5th (EV)

Awards:

- Japan Automobile Manufacturers Association Chairman's Award
- **1st Place** Best Mechanical Inspection

Mechanical and electrical inspection passed on **first attempt**

First time since 2017 to enter **all** dynamic events

First time for team to **finish** the endurance event

Autocross

Conclusion

- Time for troubleshooting and testing from reusing frame
- A reliable car foundation
- Participated in every event
- Finished endurance event for the first time
- Hunger for more speed

Acknowledgement

- This season we have received support from over 50 corporate organizations and individuals. This activity would not be possible without their support. We would like to express our sincere gratitude to all for making our activities possible and fruitful.

BOEING®

We look forward to your continued support of the
Tohoku University Formula Team