



Tohoku University Formula Team

2019 Student Formula Japan
- Formula Car Design Competition -

Outline

- What is Tohoku University Formula Team?
 - Our machine TF-19
 - Results
 - Future Plans

What is Student Formula ?

Challenges students to design, fabricate, develop and compete with formula style, vehicles.

The United States



Italy



Germany



Japan



Brazil



Australia



Train students to learn **good engineering practices**

What is TUFT: Tohoku University Formula Team?

Electric Racing Cars developed by students.



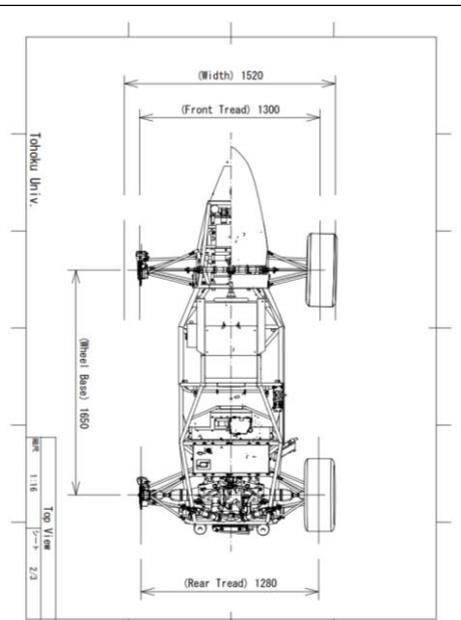
Our objective is to build a world level EV racing car, and become the **champion** of the Student Formula Japan



What is TUFT: Tohoku University Formula Team?

Whole processes are coordinated by students.

We don't just design and manufacture it,
but also manage public relations and budgetary controls.



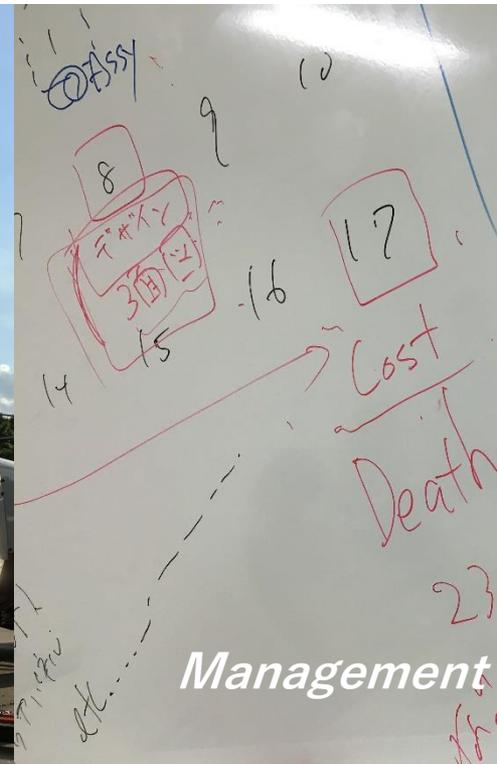
Designing



Manufacturing



Testing



Management

History

Established in 2012, participated 7 consecutive competitions from 2013.

First enrollment

Passed mechanical inspection

First dynamic event

Participated all dynamic events

Best Result



TF-13 (2013)



TF-14 (2014)



TF-15 (2015)



TF-16 (2016)



TF-17 (2017)



←EV Lightest vehicle award (2105)

Best electric circuit award 2nd place (2016) →



Project 2018

DQ from
Dynamic events
(81/93 teams)



TF-18 (2018)

Improvements

The car did not complete.

→ Lack of management skills

- Lack of technological skills and knowledge
- Immature plan and concept
- Lack of team members
- Lack of team communication

- Take time on plan and concept
- Reviewing management
- Measures for lack of members
- Encourage team communication

Project 2019

Goal: Become 1st place in Student Formula Japan

Machine Concept: “Extremely Easy to Handle”



- Drivability
 - ① Accurate Response
 - ② Stable Maneuverability
 - ③ “Feel” the Car
- Maintainability
 - ① Accessibility
 - ② Convenient Setup
 - ③ Electrically Safe

New upgrades for TF-19



- New method for designing ideal driving position
- New cowl design
- New brake disk design
- Aluminum upright

Test rides

- Shakedown on May 26th.
- Several test rides to test each dynamic events (acceleration, skidpad, autocross, endurance).
- Big progress from last year.



Shakedown



After tournament

Student Formula Japan 2019



Name of competition: Student Formula Japan 2019

Date: August 27th to 31st, 2019

Place: Ogasayama Sports Park ECOPA (Shizuoka prefecture)

Competitors: 90 teams total. 21 EV teams.

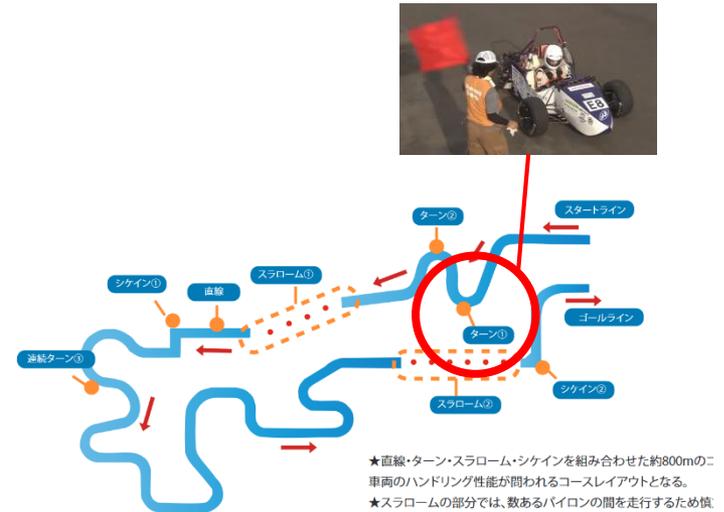
Results

Items		Rank of 90 teams (ICV + EV)	Point
Technical Inspection		69/90 teams Passed to dynamic event	Passed
Static Events	Cost and Manufacturing	25/90 teams (1 st in EV teams)	34.5/100pt
	Design	66/90 teams	43/150pt
	Presentation	65/90 teams	32.03/75pt
Dynamic events	Acceleration	15/61 teams	70.64/100pt
	Skid Pad	41/58 teams	31.37/75pt
	Autocross	-	0/150pt
	Endurance	-	0/275pt
	Efficiency	-	0/100pt
Over all result		61/90 teams	196.54/1000pt

Discussion on the systematic error

When it happened

During Autocross event, when turning right.



Cause of this error

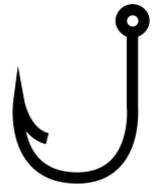
Contact failure at the terminal of the battery management circuit board.

Contact Failure



Next Year Plans

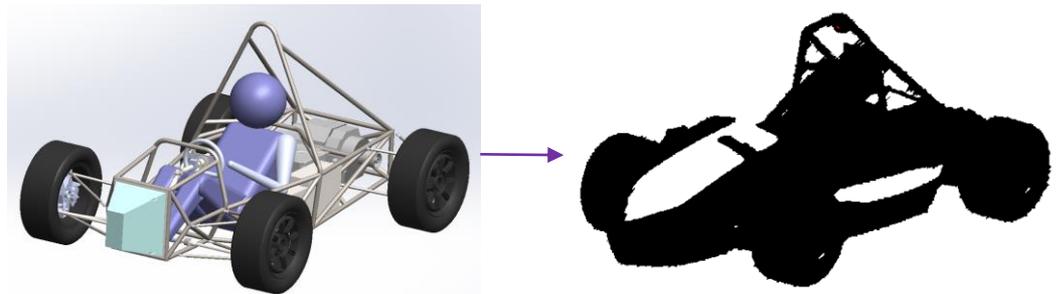
- Add locking mechanism to every terminals, with check sheets.
- Adapt the car to the car inspection requirements at early stage for competition-like test rides.
- More effective plan management to prevent plan delays.



Coming soon...

- Next Product

TF-20



“High Reliability” “Stress-free cornering”

**Cornering
Performance**

Reliability

	TF-19	TF-20	Change
Weight	320[kg]	310[kg]	-10[kg]
Height of Center of Gravity	310[mm]	280[mm]	-30[mm]
Moment of Inertia	70[kg · m ²]	55[kg · m ²]	-15[kg · m ²]

Reliability: Complete all dynamic events.

Cornering Performance: Improve the position in the dynamic events.

Thank you for your attention.

