Tohoku University Formula Team

2017 Student Formula Japan
- Monozukuri Design Competition -

Dec. 4, 2017
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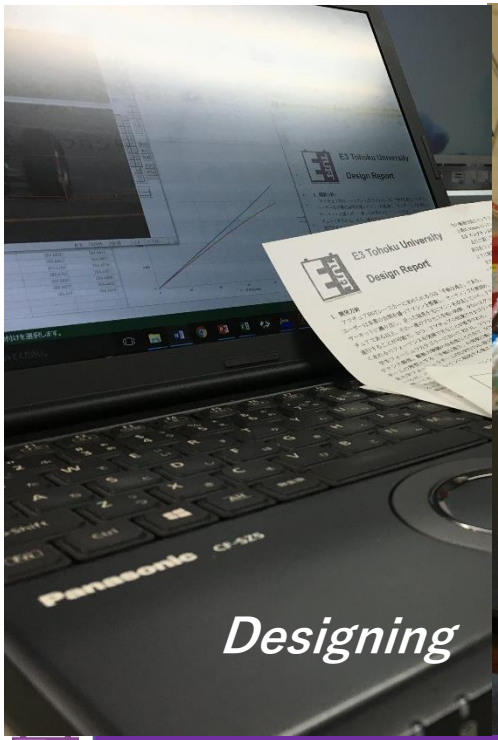
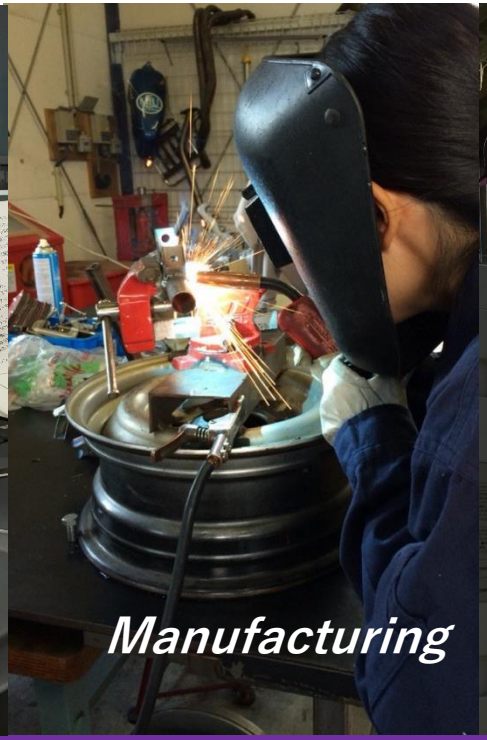
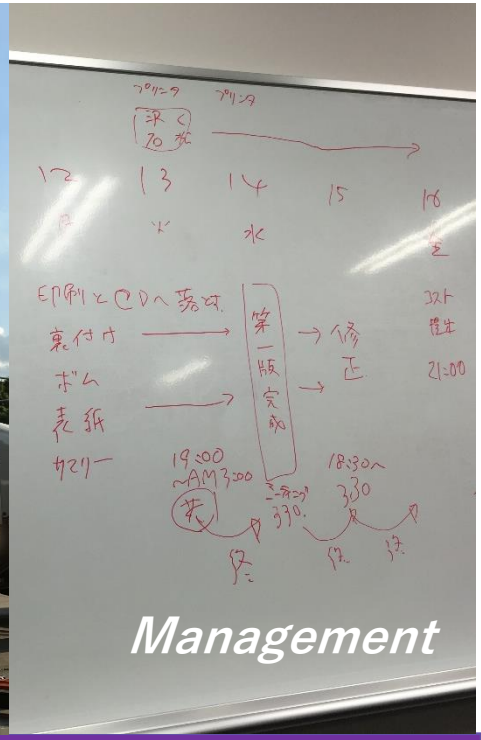
What is TUFT: Tohoku University Formula Team?

We develop Electric Racing Cars.
Whole processes are coordinated by students.

We don't just design and manufacture it,
but a public relations and a budgetary control.







About us

About team

Consisted of 10 students majoring in engineering.

We are sponsored by 50 companies . Not only financial support or parts supply but holding safety lectures and so on.

Pit

Tohoku Univ.
New Industry Creation Hatchery Center (Tagojo city)

We held meetings, PR events, machine assembly & maintenance, test run.

What's student formula ?

To challenge design, fabricate, develop and compete with small, formula style, vehicles.

Dynamic events and Static events are held.

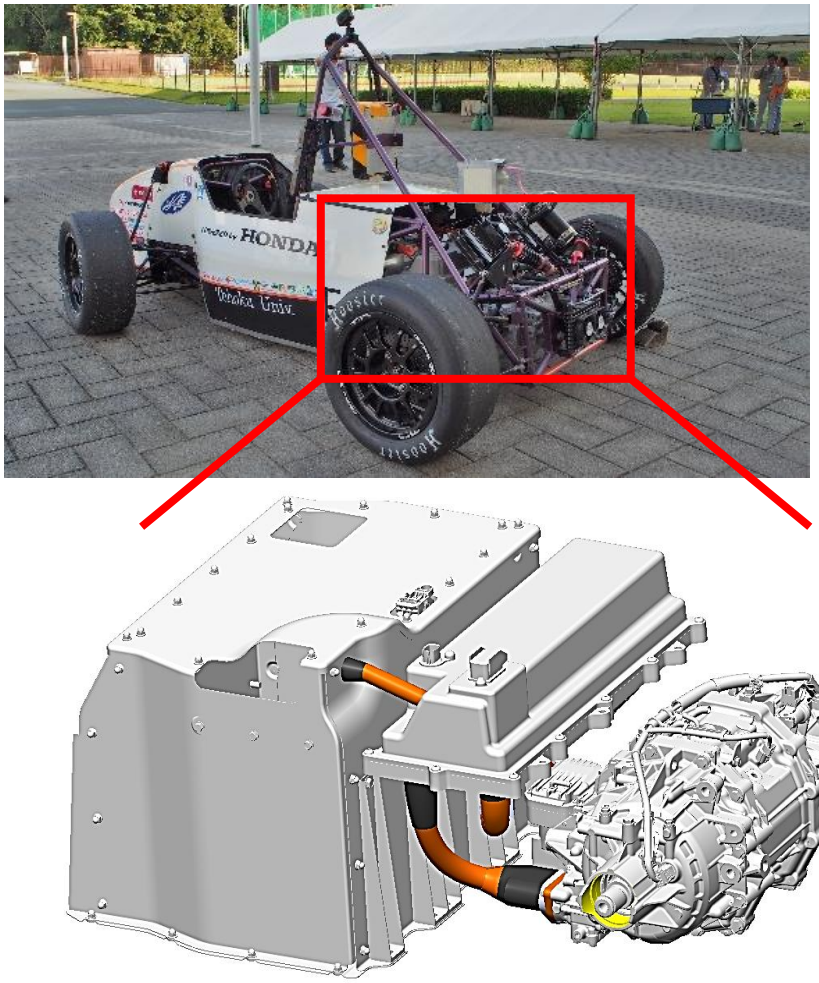
The result is depended on whole development process.

Our machine


TF-17
E3
POWERED by HONDA
トヨタ自動車東日本
株式会社トヨタレンタリース宮城
トヨタカローラ宮城
仙台トヨペット
ネッツトヨタ宮城
ネッツトヨタ仙台
トヨタレンタリース仙台
Concept : Reliable System , Reliable Performance

TF-17 specification

Specification	
Overall Length	2800 mm
Overall Height	1230 mm
Overall Width	1520 mm
Wheel Base	1700 mm
Track Width(F/R)	1300 mm
	1300 mm
Weight	334 kg
Weight distribution	F:R 42 : 58
Height of gravity center	330 mm
Peak power	27 kW x 2
Battery type	Li – ion
Battery Capacity	7.4 kWh
Max Voltage	284 V
Frame	Steel Spaceframe
Suspension	Double Wishbone x Push Rod
Tire	Hoosier 20.5 x 7.0-13



Feature : Battery, Inverter, Motor unit
Supplied by Honda R&D Co., LTD.

Result of 15th Student Formula Japan In September 2017, Shizuoka

Rank 36th (of 94 teams), 3rd (of 16 EV teams)

- Presentation **7th of 94 teams**
- Acceleration **9th of 67 teams**

Dynamic Events (Technical Inspection)

Mechanical & Electrical inspection

Tilt test

Rain test

Brake test

Quickly passed all inspection due to elaborate preparation

Dynamic Events

①Acceleration 7th of 67 teams

0-75m acceleration test on a straight course.

②Skid Pad 44th of 67 teams

Cornering performance evaluation on a figure-of-eight course.

③Auto Cross 38th of 76 teams

Running a 950m course that includes straights, bends, a slalom and a crank.

④Endurance & Efficiency 41st of 65 teams

Running Autocross course 22 laps(ca.20km).
Whole performance and reliability are evaluated.

We completed all the dynamic events except Endurance.

Static Events(Without running)

①Cost 59th of 94 teams

Evaluate Accuracy of pre-submitted report including manufacturing cost and method.

②Design 56th of 94 teams

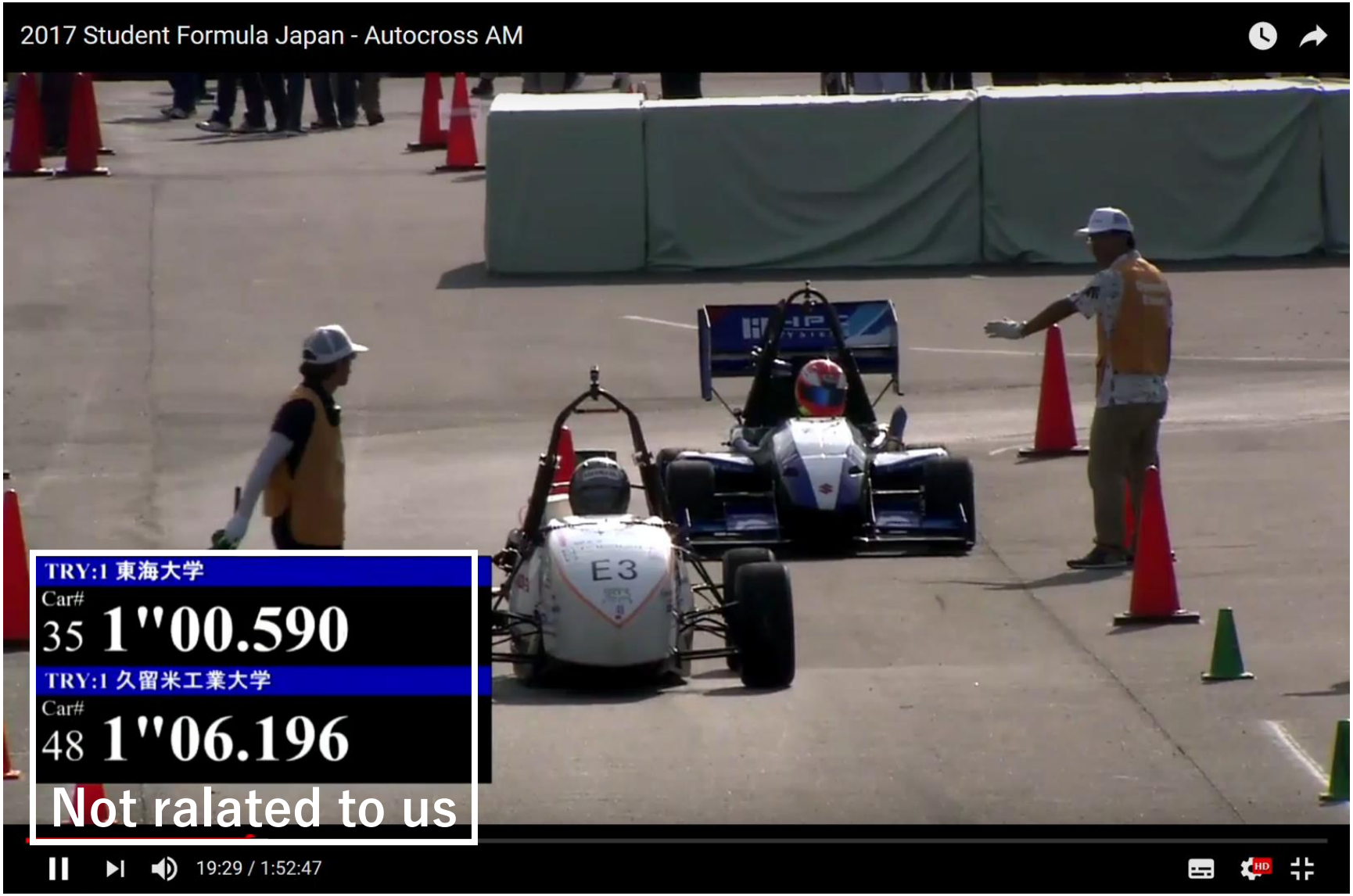
Evaluate the process and rationality of design by pre-submitted report and discussion.

③Presentation 7th of 94 teams

On the assumption that teams sell the machine, make a presentation about business plan. (Judges are regarded as a business partner)

We should have prepared more documents and knowledges.

Autocross


2017 Student Formula Japan - Autocross AM
TRY:1 東海大学
Car#
35 1''00.590
TRY:1 久留米工業大学
Car#
48 1''06.196
Not ralated to us
E3
19:29 / 1:52:47

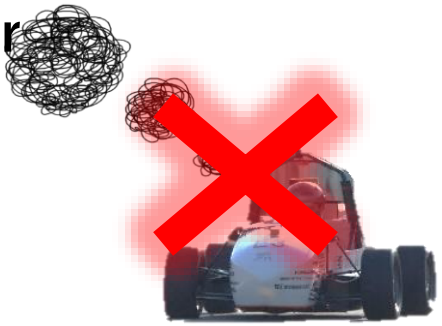
For 2017-2018 season

○ Improvement of schedule management & routine works

- Earliest machine completion in team history
- Passed inspection quickly & could make a solid strategy (ex. Consider about weather) in competition

× Not enough knowledge on “design & development” & need more consciousness to make a ”fast” car

- Fuzzy process of designing and developing
- Hurried to much of early completion
  → Lack of new idea, increase of weight
- Couldn’t make test run more effectively
  → got lower score than we’ve expected

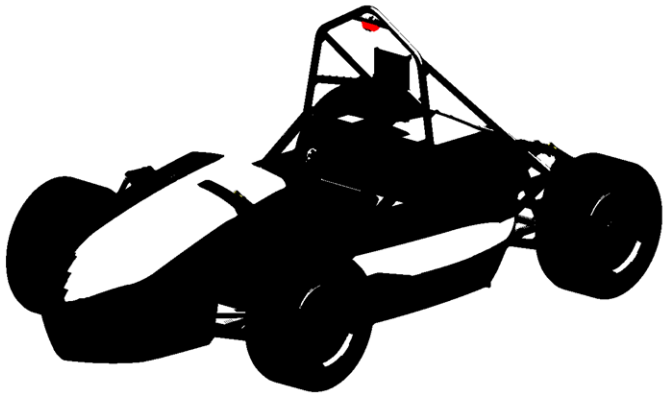


Next season:

Focus on developing “fast” machine with better management

For 2017-2018 season

Machine Concept : Beyond -Beyond TF-17, beyond rivals-



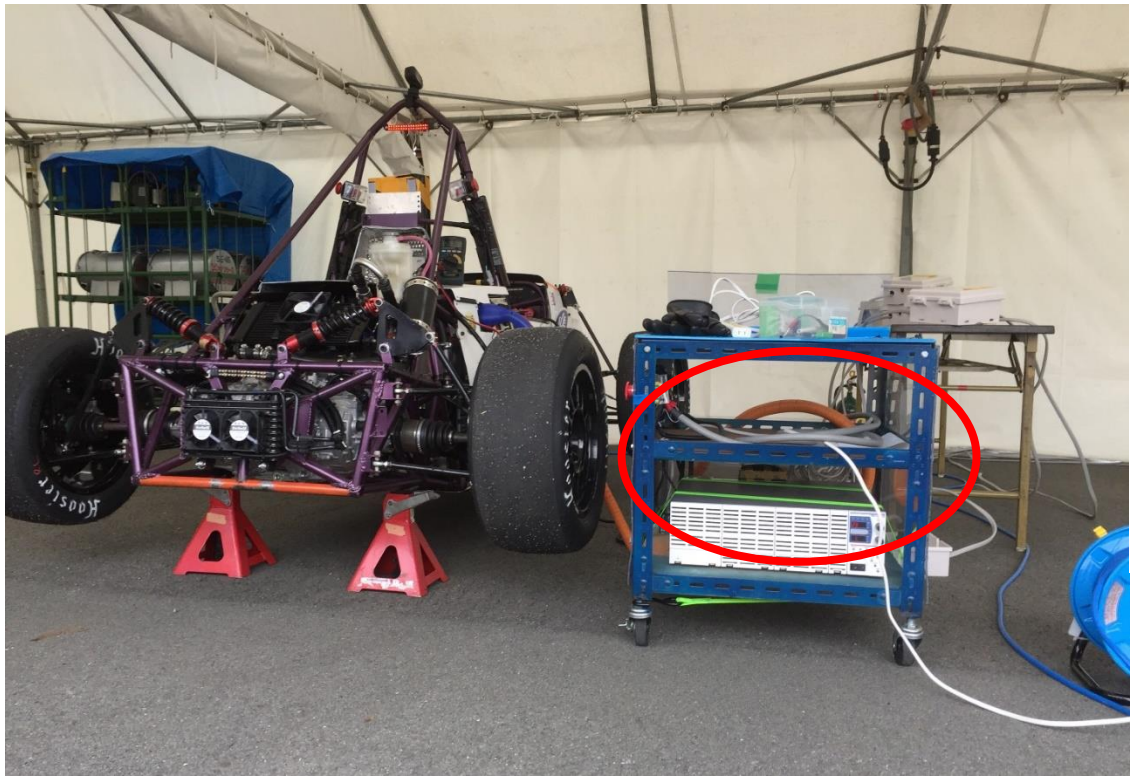
【Key Words】
- Drivability
- Traction control
- Light weight
- Torque vectoring
- Low center of gravity

Acceleration ↑

Cornering ↑

Support by Boeing Higher Education Program

We bought a charger, corresponding to 200V power supply



品名：直流電源装置
高砂製作所製
品番：ZX-S-1600MA

Battery is Fully charged by 4 hours (half of conventional)

→ **Enable us to do more test run or machine improvement**

(Longer charging time is weak point of EV)

Thank you for your attention.