

# DRIVER



# OUR TEAM

## ➤ 95 MEMBERS

Our large number of members bring a broad platform of knowledge and motivation to learn more.

## ➤ 16 DEGREE BACKGROUNDS

From Engineering to Oriental Studies – Diversity gives our team the decisive edge.

## ➤ 1 RACING CAR

The goal: to develop and manufacture a racing vehicle and to compete at international events.





# OUR HISTORY

From the idea to success

It all started with a dream! Founded in 2007 TU Wien Racing became the second youngest **student racing team** in Austria. We took part in the international Formula Student competitions for the first time in 2008 with an independently developed and constructed vehicle.

What started out as a small group has now developed into a real extended family: the team now includes just under 100 members from **various fields** of study and **diverse nationalities** who are enthusiastic about racing.



From mechanical engineering, electrical engineering and computer science to economics and oriental studies, everything is represented here. These different student backgrounds bring a wide range of knowledge with them and shape the very **special and unique team spirit**.

TU Wien Racing is a family that not only shares the fascination of racing, but also our **experience, knowledge and skills**. A team that grows together with its challenges and offers students the opportunity to put their theoretical knowledge into practice.

**Working together** and looking forward to exciting **Formula Student events** is what drives the team!

# FORMULA STUDENT

The student engineering competition

Around the world, young engineers work in more than **600 teams** on innovative racing vehicles and push them to their limits.

All this in order to compete against the world's best universities in the summer. **8 different disciplines** show who can score with the best **overall package** of a well-considered development, conscientious implementation and efficient financial planning.

## DYNAMIC DISCIPLINES

Acceleration

AutoX

Efficiency

Endurance

Skid Pad



## STATIC DISCIPLINES

Business Plan Presentation

Cost and Manufacturing

Engineering Design





**EDGE MKI**

2008

**EDGE MKIII**

2011

**EDGE6**

2014

## SPECIAL AWARDS

- **Best Engineered Car**  
2008 - Silverstone, GB
- **Audi Vorsprung Award**  
2017 - Hockenheim, DE
- **Best Self-Made Vehicle**  
2012 - Győr, HU
- **Best Electronics Design**  
2021 - Novi Marof, HR
- **Best Use of Adhesives**  
2013 - Hockenheim, DE
- **Efficiency Award Winner**  
2022 - Spielberg, AT
- **Clean Mobility Award Winner**  
2016 & 2017 - Spielberg, AT
- **Best Use of Composite**  
2022 - Spielberg, AT

**EDGE8**

2016

**EDGE10**

2018

**EDGE11**

2019

**EDGE12**

2021

**EDGE13**

2022

## OUR ACHIEVEMENTS

An insight into more than 15 years of team history

- 1ST Acceleration**  
2022 - Novi Marof, HR
- 1ST Engineering Design**  
2022 - Novi Marof, HR
- 1ST Business Plan**  
2021 - Novi Marof, HR
- 2ND Efficiency**  
2021 - Hockenheim, DE
- 2ND Autocross**  
2021 - Novi Marof, HR
- 3RD Overall**  
2022 - Novi Marof, HR
- 3RD Skidpad**  
2021 - Novi Marof, HR
- 4TH Endurance**  
2022 - Novi Marof, HR



## OUR TEAM STRUCTURE

Together towards our goal

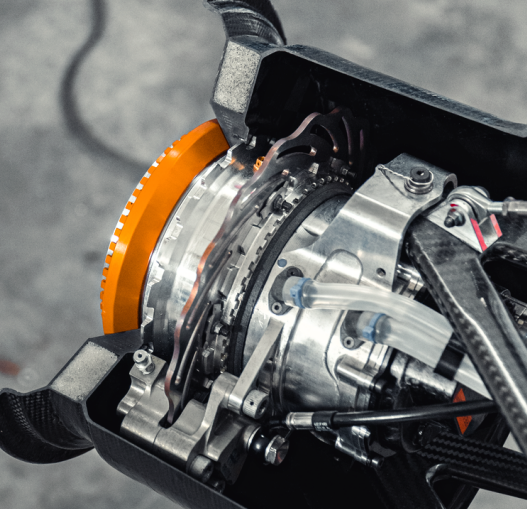
Order and structured work are very important at TU Wien Racing. In order to implement such a complex undertaking as the development and production of a racing car, holistic planning and **know-how from a wide variety of disciplines** are required.

The division into **mechanical**, **electrical** and **organizational** modules results in a clear distribution of tasks and rapid progress in the tightly packed schedule.

Nevertheless, our members are also involved in **cross-thematic work** and continue their education through internal training courses to enable a holistic understanding of our racing car.

It is only through **interdisciplinary teamwork** that we are able to turn our plans into reality and thus achieve our ambitious goals.





## ELECTRIC

Accumulator

Driverless

Electronics

Powertrain



## MECHANICAL

Aerodynamics

Chassis

Composites

Suspension



## ORGANISATIONAL

Finances

Human Resources

IT

Marketing

Sponsorship



# TECHNOLOGY

## ➤ **EDGE**

The name says it all. Its meaning: EDGE - a quality or a factor which gives superiority over close rivals.

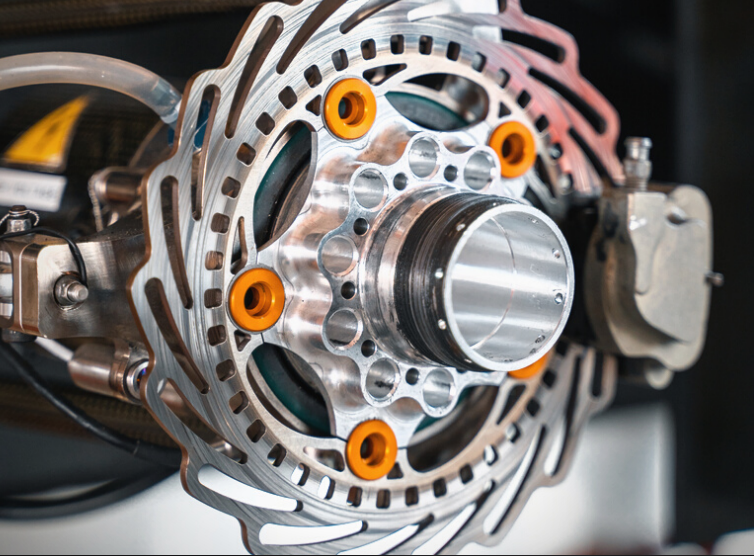
## ➤ **IN-HOUSE DEVELOPMENT**

As a team of students, we do not shy away from a challenge and attach great importance to parts that we have developed ourselves. Only a few standard parts have to be purchased externally.

## ➤ **CONSTANT OPTIMISATION**

Each EDGE is the result of years of knowledge, carefully passed on and developed from season to season.





## MOTOR

Since our very first electric vehicle, we have been proud to power our EDGE with specially developed **permanent magnet excited synchronous motors**. Currently in the 6th iteration, we are achieving a power density of over 13kW/kg with a weight of 2.2kg per wheel by using high-performance materials and a design that has been optimised many times. This is how we achieve a maximum **efficiency of 97%**. Working with a specially developed optimisation tool chain allows us to make even more improvements in the future.

## VEHICLE REGULATION

In order to fully exploit the potential of the separately driven wheels, we have developed two control systems. **Yaw Rate Control** stabilises the EDGE when cornering by individually distributing the power to the drive wheels. In addition, the **Traction Control** ensures that the wheels have the optimal slip and thus the greatest possible acceleration is achieved. Both systems were tested and optimised in advance using the complete vehicle simulation we developed.

## POWERTRAIN

A specially developed wheel carrier was designed in order to transfer the engine's torque to the road while maintaining optimum grip when cornering. It includes both the **planetary gear** and the connections for the wheel hub motor and the **brake system**. The suspension system consists, among other things, of completely self-developed **carbon wishbones**.

## INVERTER

With the 3rd iteration of our self-developed IGBT inverter, we control our motors with peaks of up to 90A. The goal of increased reliability was achieved through the use of self-developed **EMI filters** and matched connectors. We have also succeeded in implementing a **sensorless control system** that uses a current model to determine the position of the rotor. However, the current developments deal with our latest inverter technology **based on SiC**.

## ACCUMULATOR

Our accumulator is based on the principles of maximum efficiency, the highest possible energy density and lightweight construction. A specially developed **battery management system** enables us to automatically include high-resolution information on the condition of the battery in driving dynamics decisions and to view the data at any time in our **live telemetry**. Furthermore, thanks to the precise modeling of the cells, the **state of charge** can be determined at any time via their internal resistance.



## DRIVERLESS

In order to be able to take part in driverless competitions, we are developing an autonomous racing car. With the help of a **stereo camera** and sensor data, we are able to record the exact track position of the EDGE. A **self-developed algorithm** then provides the optimal path to complete the course as quickly as possible. In order to follow this, the vehicle control ensures the right steering angle and the required speed.





## UNDERCARRIAGE

The key issue of lightweight construction is reflected in our undercarriage in particular in the unsprung masses. The extensive use of **carbon fiber** composite materials enables optimal driving characteristics thanks to **high rigidity despite the low weight**. This can be seen particularly in our specially developed **carbon rims** and **wishbones**. The wheel carrier and the wheel hub not only have the task of connecting these parts, but also serve as a housing for our motors and the gearbox.

## CHASSIS

Our **monocoque** is the vehicle's largest cohesive structure, encasing not only all of the internal components but also the driver. This is a **load-path-optimized, carbon-fiber-reinforced sandwich component** with integrated firewalls and a crash-optimized front structure. In addition to the design for **maximum safety**, weight and performance are driven to their optimum in our development and enable the **connection of the most heavily loaded components** of the chassis and the aerodynamic components.

## AERODYNAMICS

The aerodynamic package of our racing car consists of the elements of the front wing, rear wing and underbody. The special arrangement of the **carbon elements** directs the airflow around the vehicle as efficiently as possible, while at the same time generating **maximum downforce**. The forces generated are so high that you could even drive upside down on the ceiling at a speed of 110 km/h!

# BECOME PART OF THE TEAM

Strong partnerships as the basis for success

The **realisation of a project** of this magnitude could not be handled by us alone. Because of this, our team relies on countless **strong partnerships** that allow us to bring our developments to the racetrack.

The close, joint cooperation with our partners enables us to exchange valuable **technology, information and experience**, which is beneficial for both sides and the basis for a successful season.



## SHOW PRESENCE

Whether at Austria's largest **industrial trade fairs**, at Vienna's **universities** or in **social networks** - you are represented everywhere thanks to our partnership.

## MAKE ACQUAINTANCE EARLY

After their studies, our members end up in **top companies** in a wide variety of industries - get in touch with future employees or customers today.

## EXPERIENCE TRACK DAYS

Be present at the Formula Student competition on the **Red Bull Ring** or the **Sponsor Day** organized especially for you - experience the pure racing feeling.

## ESTABLISH CONTACTS

Our wide **partner network** is represented at our events - take the opportunity and exchange ideas.

## NURTURE TALENT

The **promotion of young talents** is something you can be proud of - let our partnership supplement your CSR measures.

## SHARED SUCCESS

Our success is also **your success** - inspire your employees by directly participating in our project.



**PLATINUM**

FROM €15,000

**GOLD**

FROM €7,000

**SILVER**

FROM €3,500

**BRONZE**

FROM €1,000

**CLASSIC**

UP TO €1,000

Newsletter Mention

Logo placement on  
our team uniform14 cm<sup>2</sup>7 cm<sup>2</sup>Logo placement on  
our EDGETwo sides 250 cm<sup>2</sup>Two sides 100 cm<sup>2</sup>One-side 40 cm<sup>2</sup>

Social Media



Individual



Individual



Individual



group post

Job portal



4 Tenders



3 Tenders



2 Tenders



1 Tender

Print media



Events

Logo placement on  
our website

Financial and in-kind benefits are calculated differently. We would be happy to discuss an exact classification in person.



Internationales Wiener  
Motorensymposium









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TU Wien Racing



youtube.com/tuwracing

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