**Introduction**

Unlike what one might think, a Formula Student dynamic event is not all about speed. Handling is at least as crucial to achieve a good laptime as top speed. In this context, steering plays a key role. The point of this project was thus to design and manufacture a steering system that would be light, reliable, rule compliant and as dynamically efficient as possible.

**What geometry for the steering system?**

Several designs exist concerning race car steering. Most notably, Ackerman and parallel geometries. Ackerman geometry makes the inner wheel turn more than the outer one, improving low speed cornering. In parallel steering both wheels turn the same rate. Although it scrubs tires at low speed, it limits understeer at higher pace, countering the effect of slip angles. Our car has a slightly Ackerman geometry.

**What composes the steering system?**

- **Universal joint:** A double universal joint is needed to accommodate the 45° angle of the column. It is important to have no looseness in this part, as it would be detrimental for the dynamics of the vehicle.

- **Coupling system:** Used to correct any misalignment between the steering wheel and the actual angle of the wheels.

- **Tie rods:** Tie the wheels to the rack. Ball joints are screwed at both extremities to allow length modification, hence the adjustment of the static toe of the car. Indeed, the front wheels are slightly convergent (0.5° to 2°), this gives more grip to the front end in corners.

- **Steering rack:** Used to convert rotation from the steering column to the translation of the tie rods. It is highly geared to enable the pilot to reach steering lock with no hand movement. It includes a sensor measuring the steering angle. This measure may be used among other telemetric data to help pilots improving their lap-times.

- **Steering wheel:** Made out of beech wood, the steering wheel is the result of long weeks of research to be ergonomic, ecologic and easily recognizable among every others in the paddock.

**Quick release:** With a single actuation, drivers can remove the steering wheel and leave the car in case of an emergency.