



Continental Automotive Systems Sibiu

Continental Technical Competition 2015

Autonomous vehicle – design and implementation

Rules and regulation booklet

Continental
The Future in Motion

Students Technical Competition 2015
Design & implement an autonomous parking vehicle

Awards:

- 1st Place - 1000 EURO
- 2nd Place - Trip to Formula Student 2015
- 3rd Place - Conti Branded Products

Subscription deadline: 12th of January 2015
Competition Date: 23rd of April 2015

To: silvana.lucaciu@continental-corporation.com
More details starting with 14th of November at:
www.romania.careers-continental.com



I. GENERAL ASPECTS

a. Target group

- The competition is addressed to all active students (including master programs) from technical faculties (Computer Science, Electrical Engineering, Electronics, Mechatronics, Robotics, Electromechanics, etc)

b. Competition team

- Consisted of maximum 3 students regardless the technical area of expertise

c. Project idea presentation

- For the pre-selection the teams should prepare a presentation document within 10 pages written in English, that will include:
 - Project description / architecture
 - Costs / spending
 - Details of all technical aspects involved in the projects
 - List of materials needed to implement the project idea (including a web link with component data sheet)
 - Main steps of implementing the project idea and responsables
 - Time planning
 - Other aspects that proves the fulfillment of the contest requirements
 - Deadline for sending the presentation: 12th of January 2015
- Participation intention e-mail should be send prior to the presentation described above
- Previous already done projects with the same functionality are forbidden, including existing (already built) products on market.
- The entire product value (including all parts – bought or already owned) should not exceed 250 Euro
- The first period of pre-selection ends on 23rd of January
- A second pre-selection will take place between 16th – 20th of March when all the teams previously selected must provide an actual status of the project, meaning pictures and a short movie with the demo car being able to recognize a 3 color (green (6cm), black (6cm), blue (6cm)) pattern after which the car will turn right. No gap is allowed between the colors of the pattern.

d. Financial aspects*

- The final product will remain in the teams' property
- The transport will be supported by Continental Sibiu if you travel by train and/or bus (based on the travel tickets for each team member)

* Note to previous participating teams: Continental will not offer grants anymore.

e. Deadlines and checkpoints

- Application deadline: 12th of January 2015
- Pre-selection deadline & Results communication: 23th of January 2015
- Final selection deadline & Results communication: 20th of March 2015
- The selected teams will have to implement the project until 23rd of April 2015 according to the original idea. No deviations allowed

- Competition date: 23rd of April 2015
- Regular checkpoints during implementation will be performed online. Project implementation status will be sent online via e-mail
- In the day of the contest, teams are allowed to bring with them the equipment needed for final adjustments

II. TECHNICAL REQUIREMENTS

a. Racing track

- The car should be able to drive independently on a designated area, from Starting line up to Finish line
- The track has a White border which must not be trespassed by the car wheels
- If any wheel is outside the track border, the car will be disqualified
- The car have to be able to park independently, following the below rules:
 - o After a Green – Black – Blue pattern, the car has to park in a Green Parking Lot on the right side
 - o After a Black – Blue pattern, the car has to turn left without parking
 - o After a Red – Black – Blue pattern, the car has to park in a Red Parking Lot on the left side
 - o If the pattern detected by any car is Blue – Black, the car is moving in the wrong way
 - o The parking is taken into account if the car will have all 4 wheels in the same time inside the lot, in a steady position, for at least 5 seconds
- The width of the White stripe will be between 1.5 and 3 cm.
- The width of the Green stripe will be between 5.5 and 6.5 cm.
- The width of the Black stripe will be between 5.5 and 6.5 cm.
- The width of the Blue stripe will be between 5.5 and 6.5 cm.
- The Green and Red Parking Lots will have the following dimensions: 50 x 50 cm
- The racing track will have the following characteristics:
 - max path length: aprox 7.5 m
 - surface materials: plywood

b. Competition vehicle

- The team should develop an autonomous vehicle
- Car chassis and motor can be bought as one piece
- The vehicle should have the following characteristics:
 - max length: 30 cm
 - max width: 20 cm
 - max height: 15 cm
- The development team should implement the following HW parts:
 - development board using microcontrollers (e.g. PIC, AVR, Motorola)
 - sensors (no camera allowed)
 - motor driver
- The development team should implement the driving SW as follows:
 - PWM signals for the motors
 - Timers / counters
 - Interrupts
 - ADC
 - Data acquisitions



III. CONTEST RULES

a. Preparation time

- Each team will be granted 3 hours of preparation time before the contest begins
- Modifications regarding the vehicles' behavior (HW and SW) are allowed during the contest
- Contest judges will allow the teams to enter the competition only if after the 3 hours of preparation the vehicle is according to the technical requirements.

b. Competition

- Only one car is allowed to be placed on the track at any given time
- Each team has the right of three official attempts.
- A car can run on the track as long as all the wheels are inside the White border
- Correct parking: all 4 wheels inside the designated color and the car is stopped for at least 5 seconds
- Incorrect parking: all 4 wheels inside the not designated (incorrect) color
- Each correct parking is awarded with 5 points
- Each incorrect parking gets a penalty of 5 points
- Each car driving by without parking will get a penalty of 10 points for each parking area in which it was supposed to park
- Incorrect parking followed by correct parking means 0 points
- The first criteria of winning the competition is the Point criteria
- The second criteria is the time
- Each car will have 3 attempts
- The best lap will be taken into account for the final results
- Best lap: maximum number of points. In case of more than one lap with the same number of points, the best time will be taken into account
- There will be a 3 minutes limit time in which the track should be completed at each attempt

c. Selection criteria

- Presentation of the project idea and design
- Final selection with pictures and movie
- The evaluation will be made by the Continental technical team

d. Appeals

- The appeals can be submitted to the organizers only when all the participants finished all the rounds.

IV. Contacts

If any questions feel free to contact us via e-mail on the following address:

technical-competition@continental-corporation.com

V. Track samples

- The following print screens are only for information, they are not official and they are subject to be changed!

