5. Catalysts Coding Contest

Linz / Austria

May 27, 2011

Autonomous Mars Rover

Catalysts

Ein Mars-Rover soll eine Strecke von mehreren hundert Metern autonom zurücklegen.

A Mars Rover shall cover a distance of several hundred meters autonomously.

Der Rover hat einen Vorderradantrieb.

The rover has front wheel drive.

Input-, Output-Einheiten:

Alle Distanzangaben sind in Meter, alle Winkelangaben in Grad

Input-, output-units:

All distances are in meters, all angles in degrees.

Vereinfachung: Der Radabstand von der Vorderarchse zur Hinterachse wird für die Berechnung des Wendekreisradius benötigt. Ansonsten ist der Rover punktförmig zu betrachten.

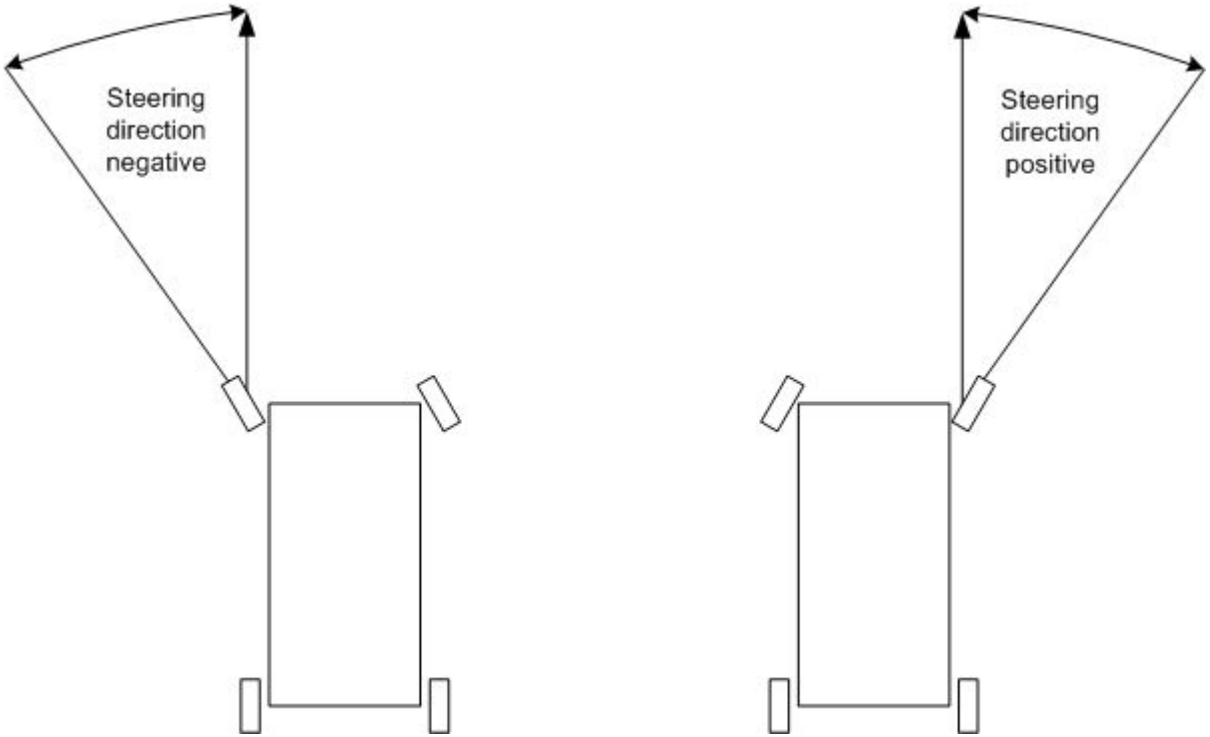
Simplification: The distance between the front and rear wheels (wheel base) is needed for calculating the turn radius. Otherwise the rover can be considered as a point.

Steering

Catalysts

The rover can be steered up to a maximum steering angle

- in positive direction (0..MaxSteeringAngle°) or
- in negative direction (0 .. -MaxSteeringAngle°).



Level 1

Catalysts

Calculate the turn radius („Wendekreisradius“) at a given steering angle.

Input: WheelBase SteeringAngle

(2 floating point numbers)

Output: TurnRadius

(1 floating point number, rounded to two digits)

Example:

Input: 1.00 30.00

Output: 2.00

You can compute the turn radius via the following formula:

TurnRadius = WheelBase / sin(SteeringAngle)

Note: TurnRadius = radius, not diameter