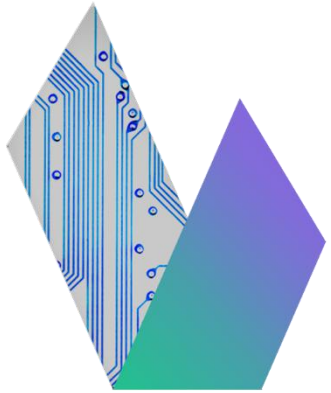
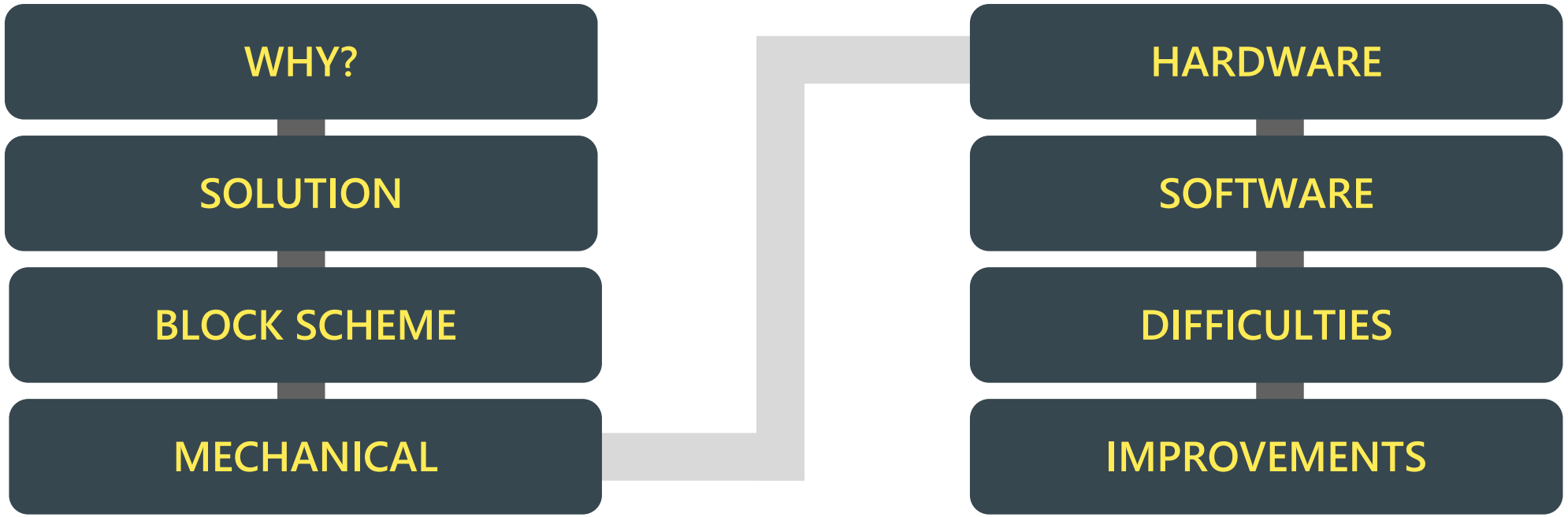


THE DREAM BUILDERS

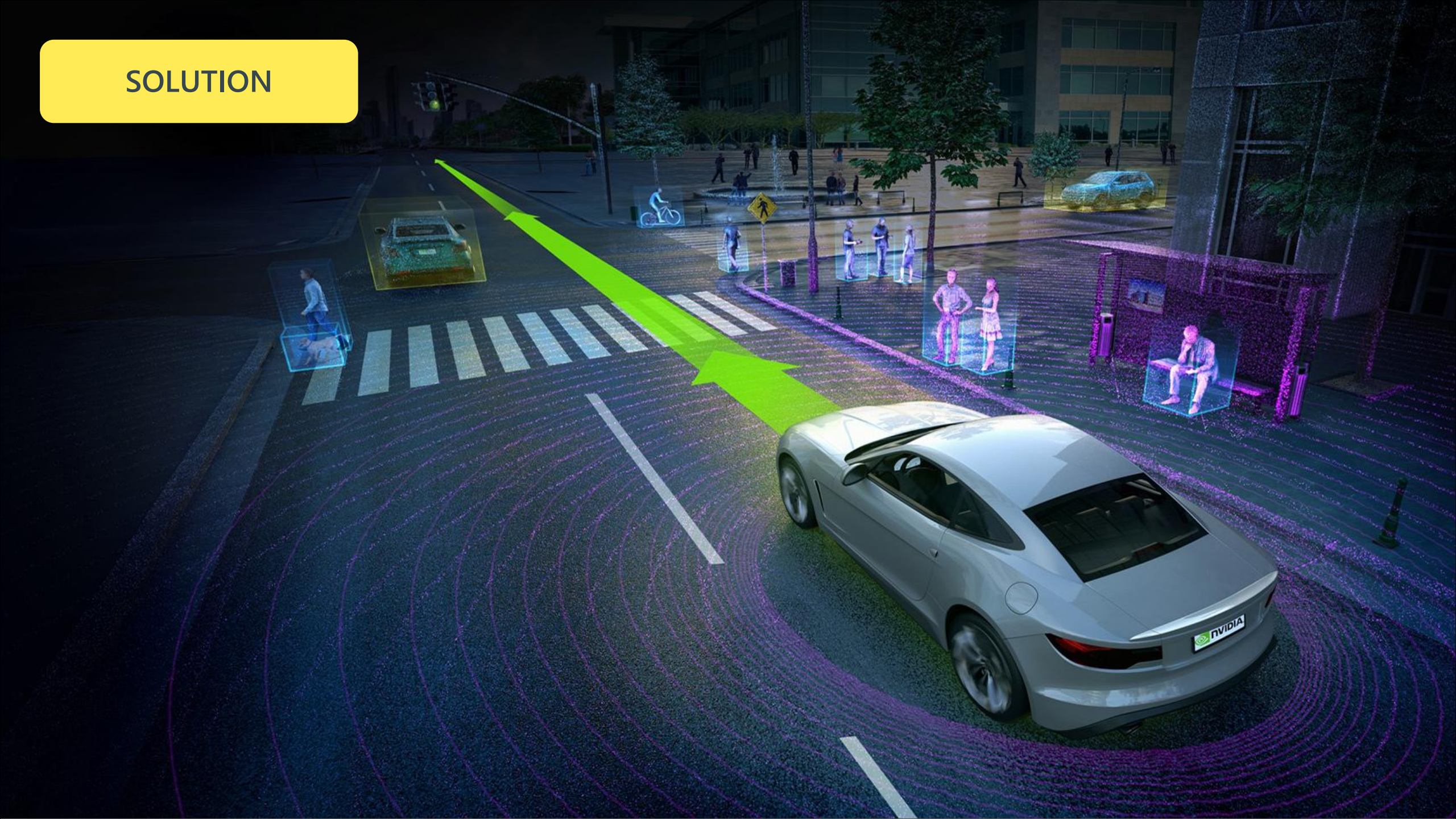
ELECTROMOBILITY STUDENT COMPETITION 2017

CONTENT

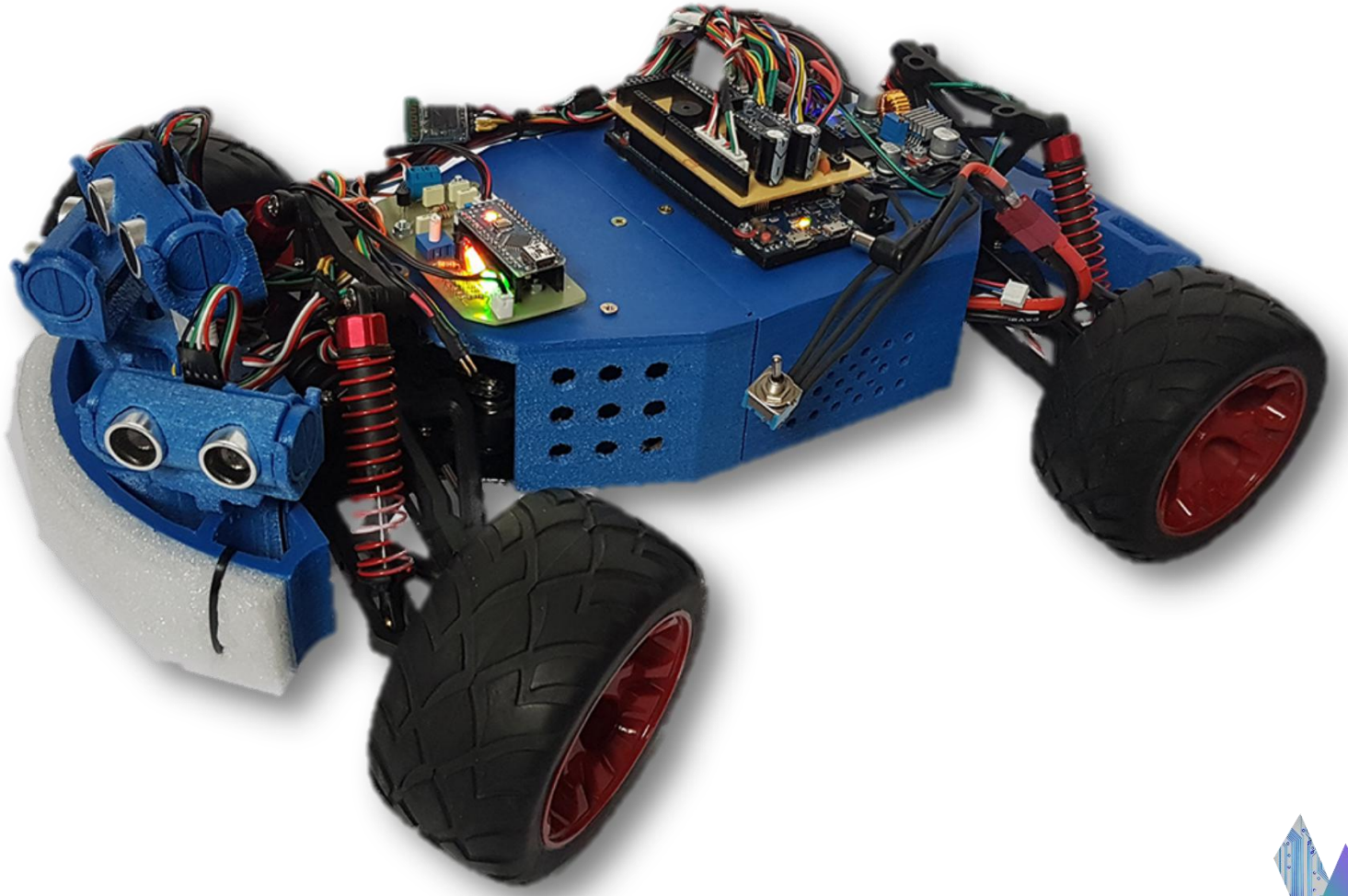

WHY?
SOLUTION
BLOCK SCHEME
MECHANICAL
HARDWARE
SOFTWARE
DIFFICULTIES
IMPROVEMENTS

WHY?

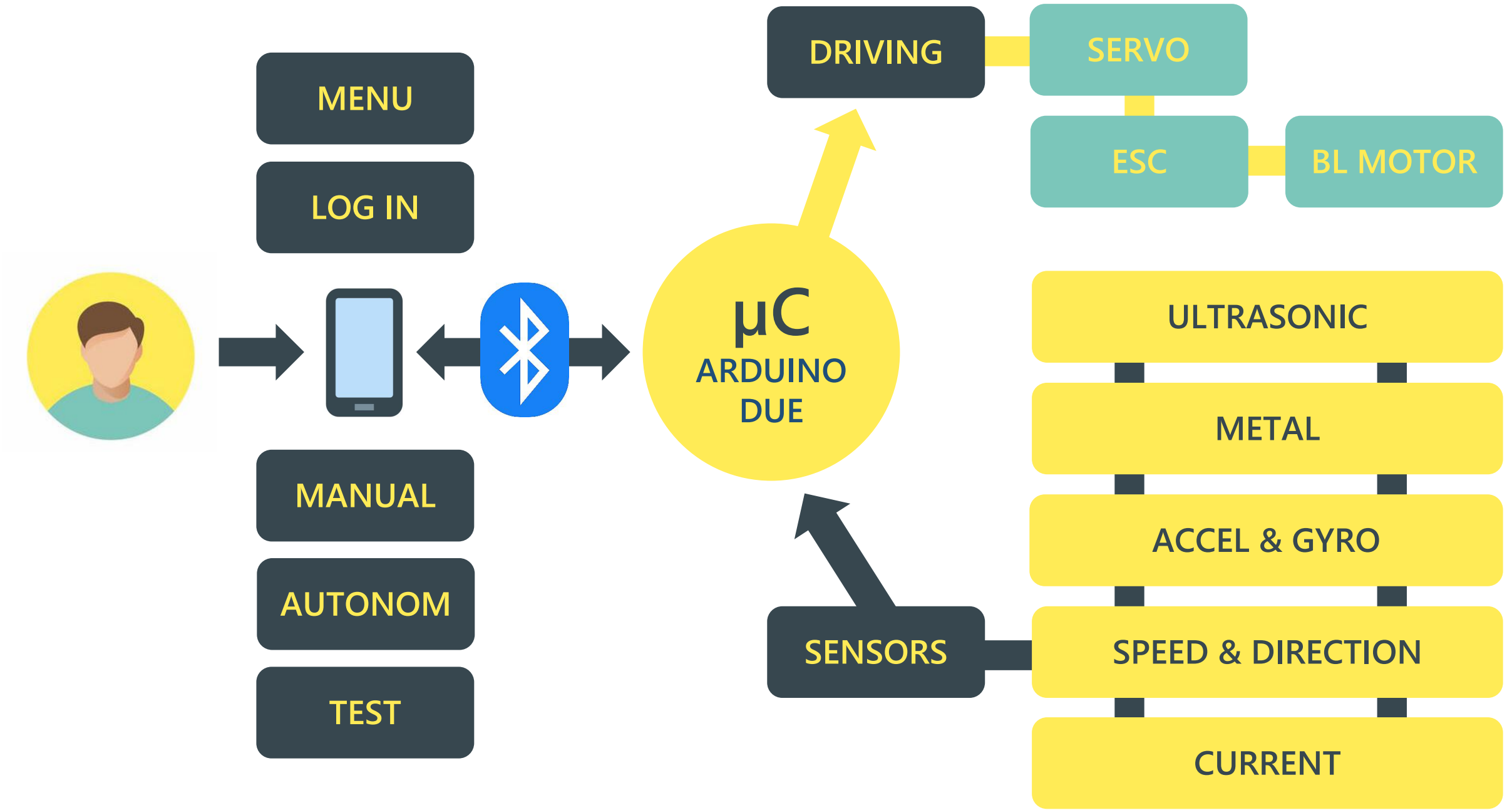
SOLUTION



IMPLEMENTATION



THE DREAM BUILDERS


MENU
LOG IN
MANUAL
AUTONOM
TEST
DRIVING
SERVO
ESC
BL MOTOR
µC
ARDUINO
DUE
SENSORS
ULTRASONIC
METAL
ACCEL & GYRO
SPEED & DIRECTION
CURRENT

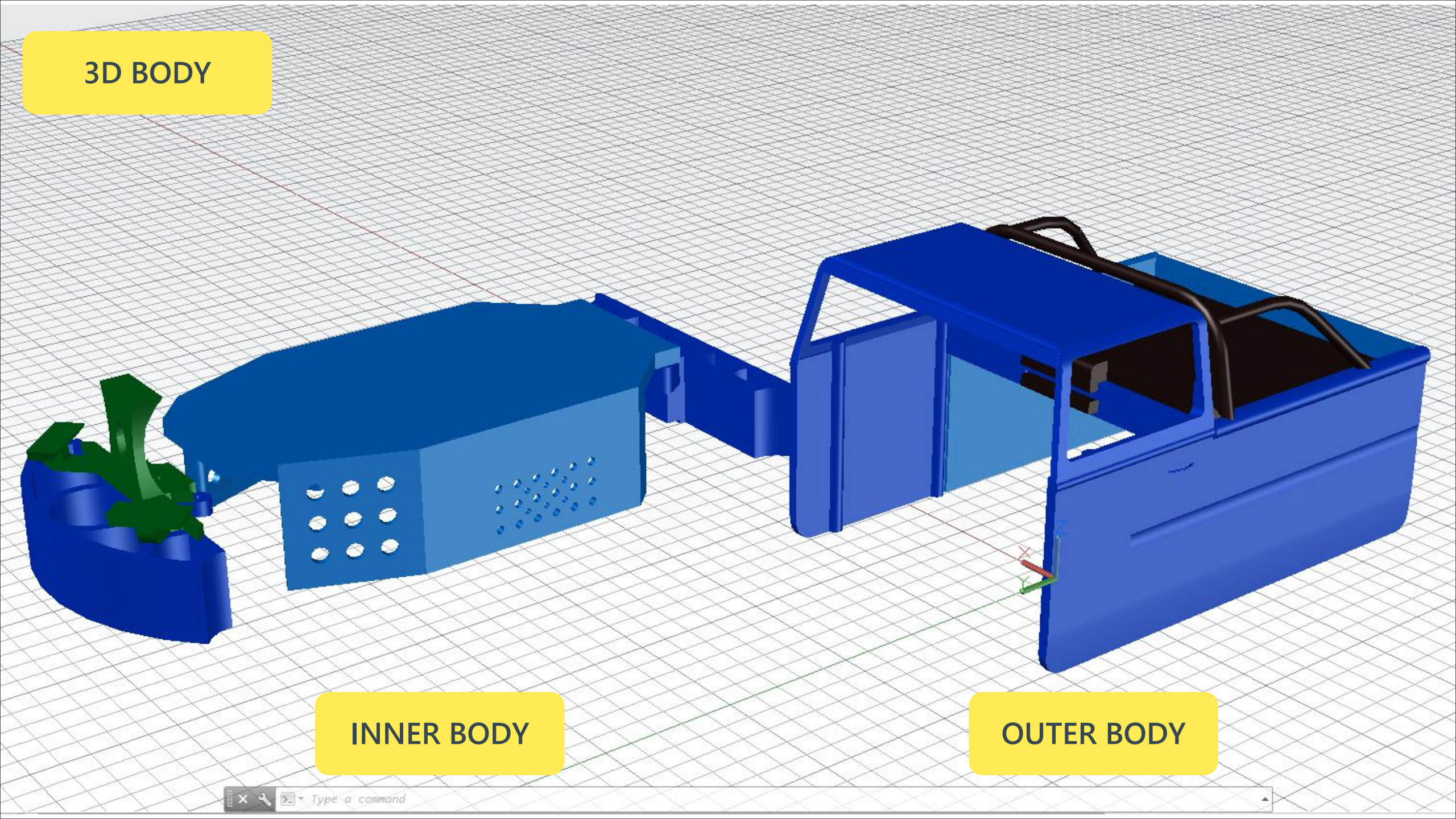
MECHANICAL

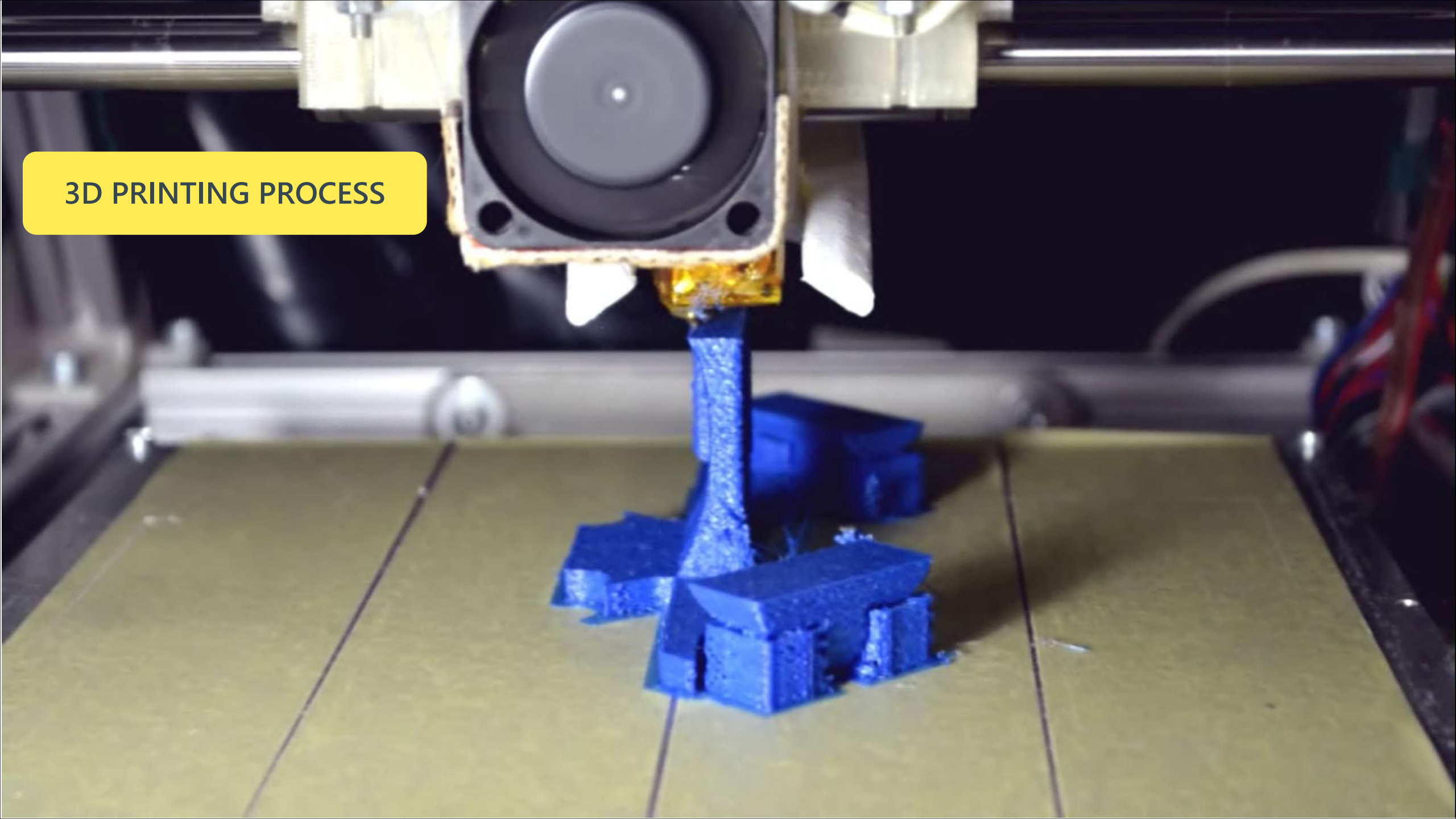
CHASSIS

AWD

INDEPENDENT SUSPENSION

FRONT/BACK DIFFERENTIAL

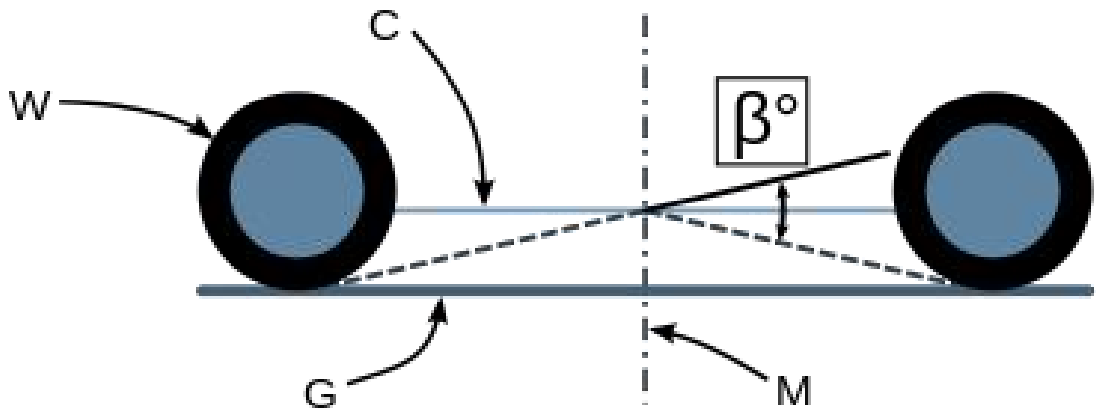

3D BODY
INNER BODY
OUTER BODY
Type a command


3D PRINTING PROCESS

CAR GEOMETRY

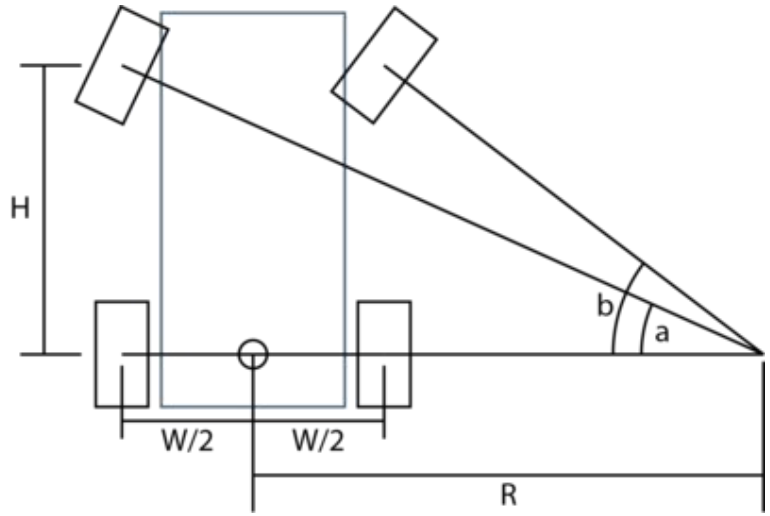
BREAKOVER ANGLE

$\beta = 2 \times \tan^{-1}(2 \times 4.7\text{cm} / 27\text{cm}) = 38.4°$



ACKERMANN STEERING

a = 27 / (62 + 13/2) = 21.51°
b = 27 / (62 - 13/2) = 25.94°



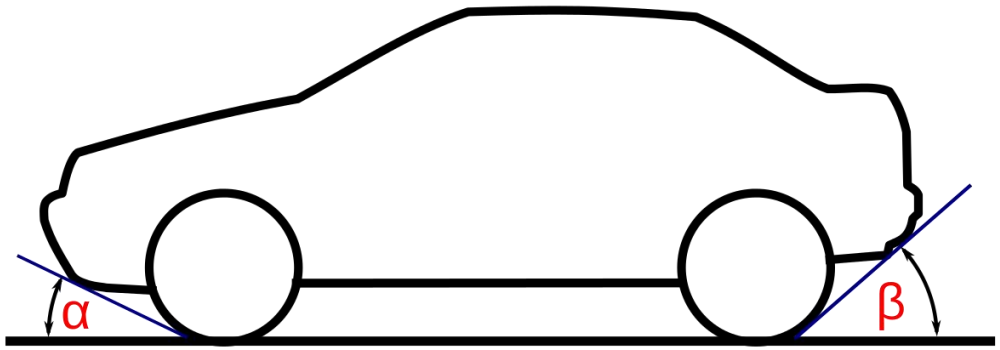
CAR GEOMETRY

Approach angle (α)

$\alpha = \sin^{-1}(4.5cm / 7.5cm) = 36.9°$

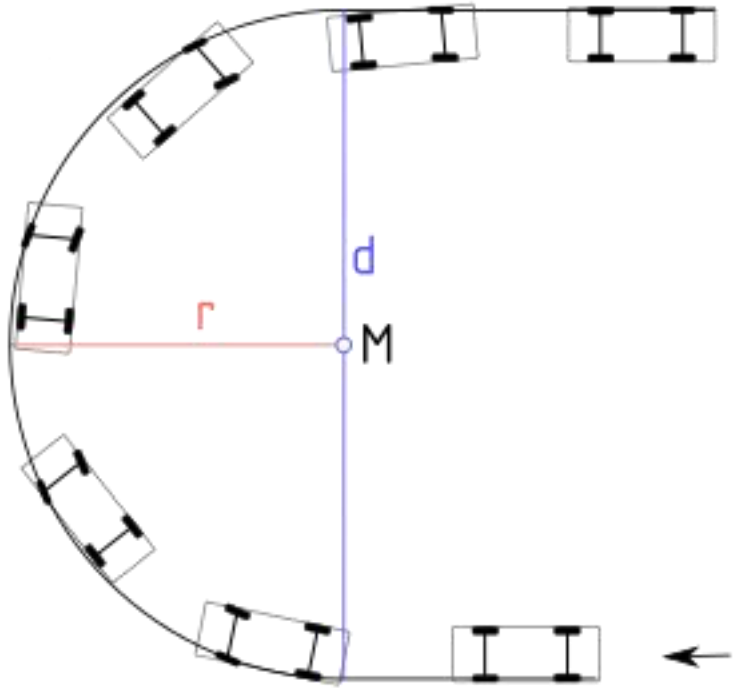
Departure Angle (β)

$\beta = \sin^{-1}(4.2cm / 7.5cm) = 34.1°$



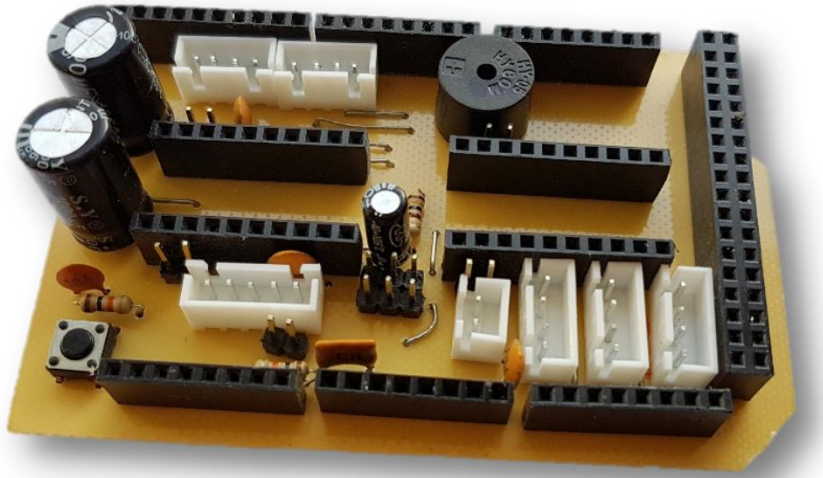
Minimum turning radius

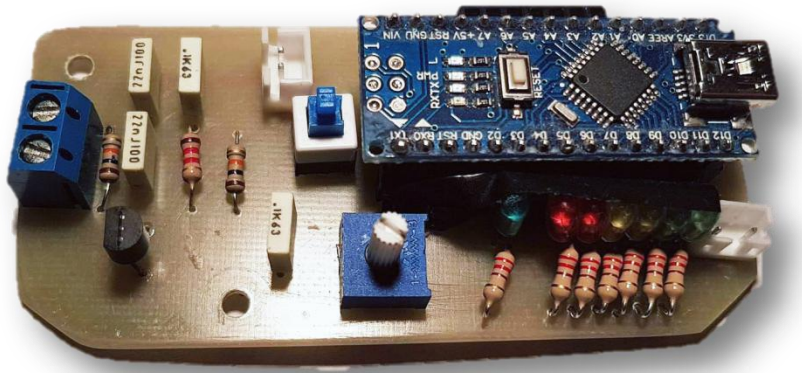
R = 80 cm



HARDWARE

PCB

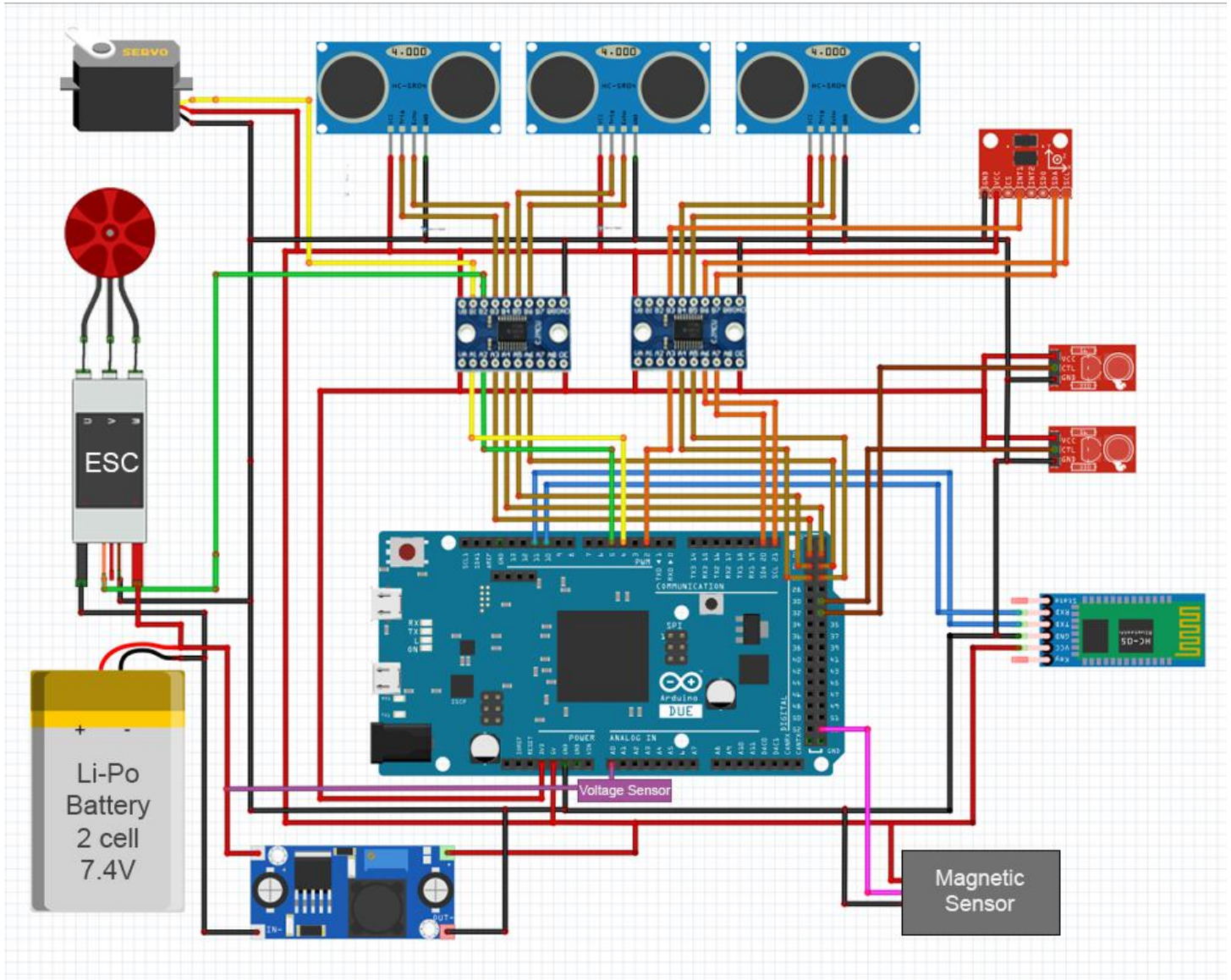


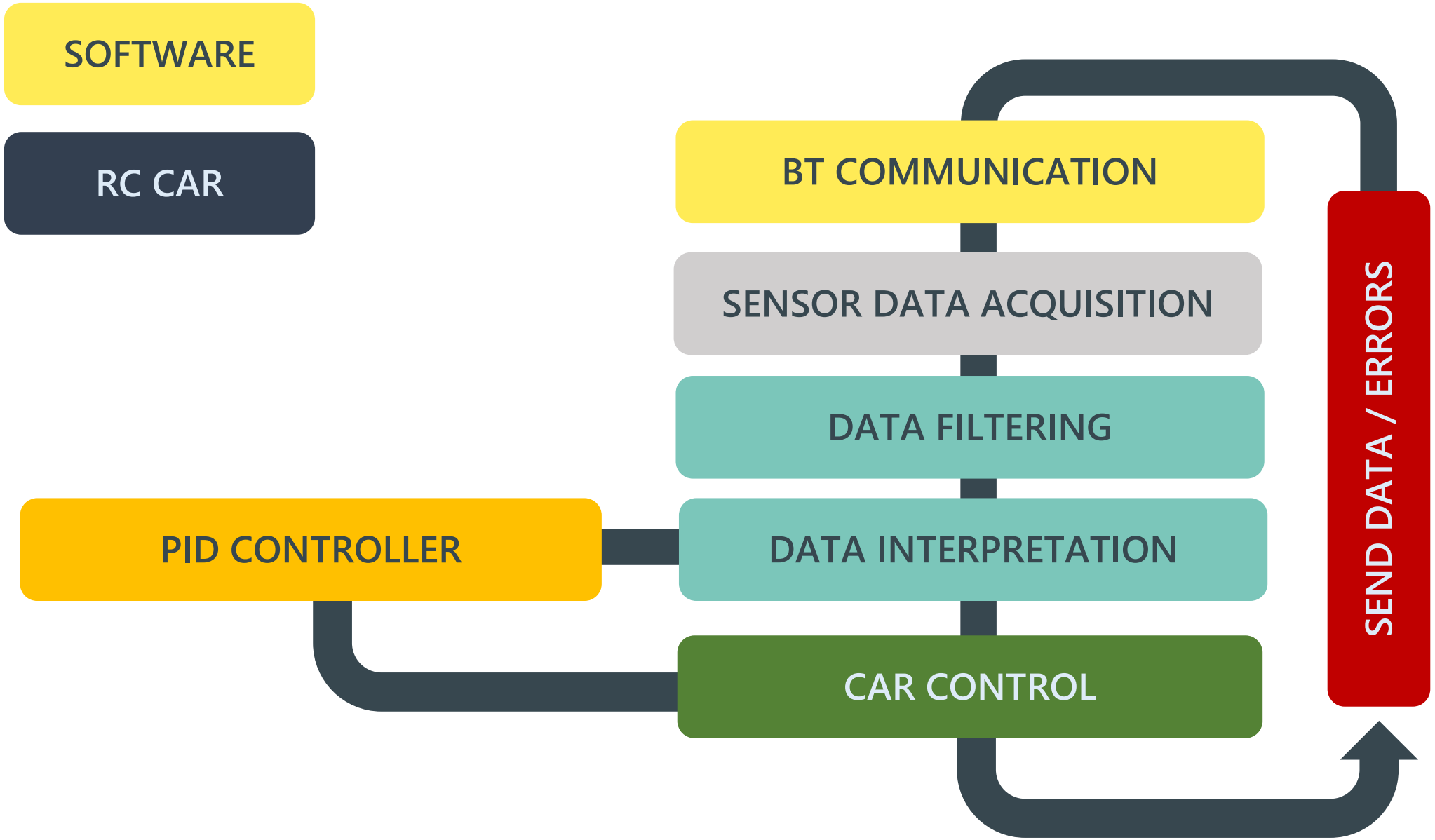


ARDUINO DUE SHIELD

METAL DETECTOR

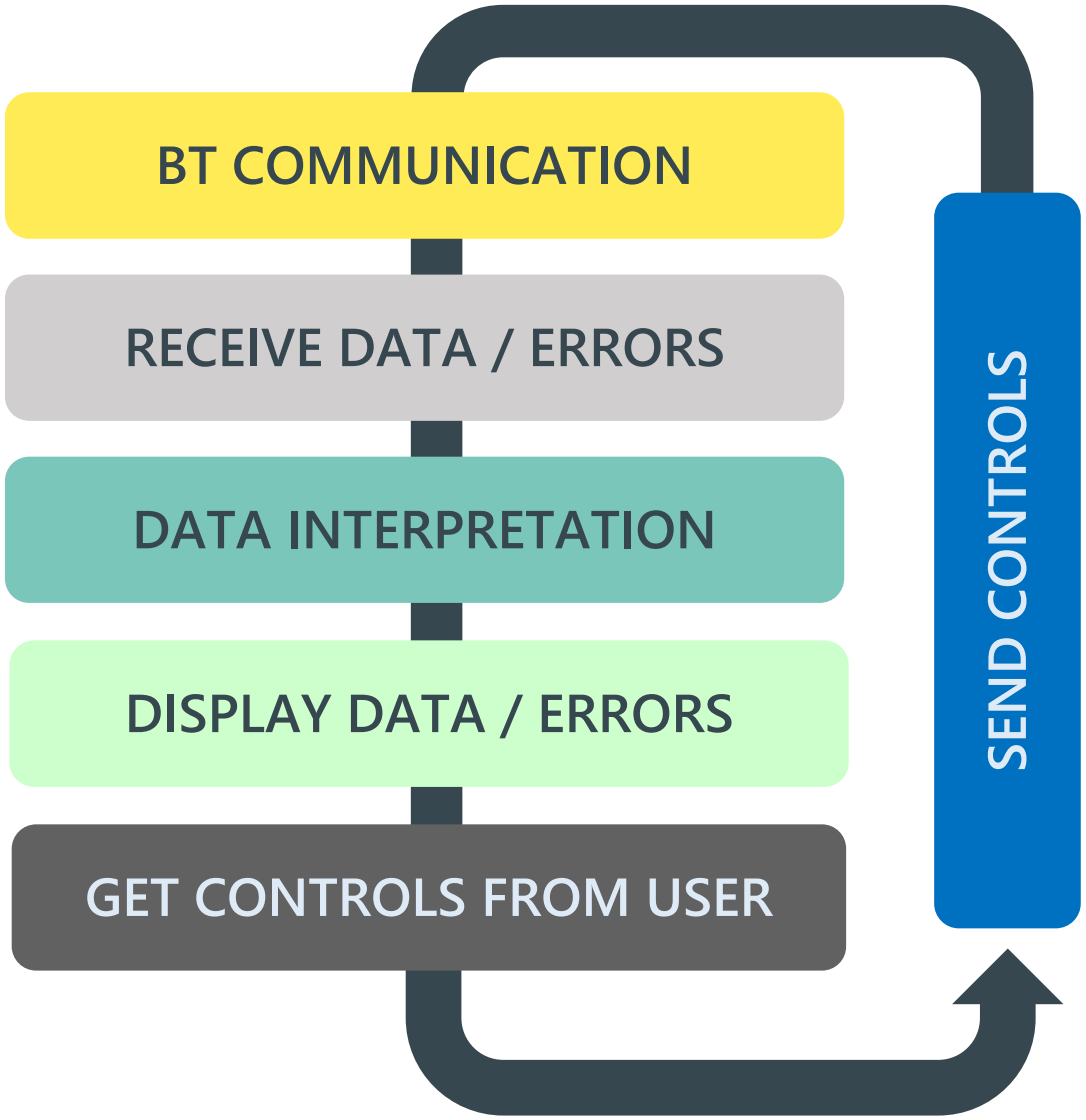
BLOCK SCHEME



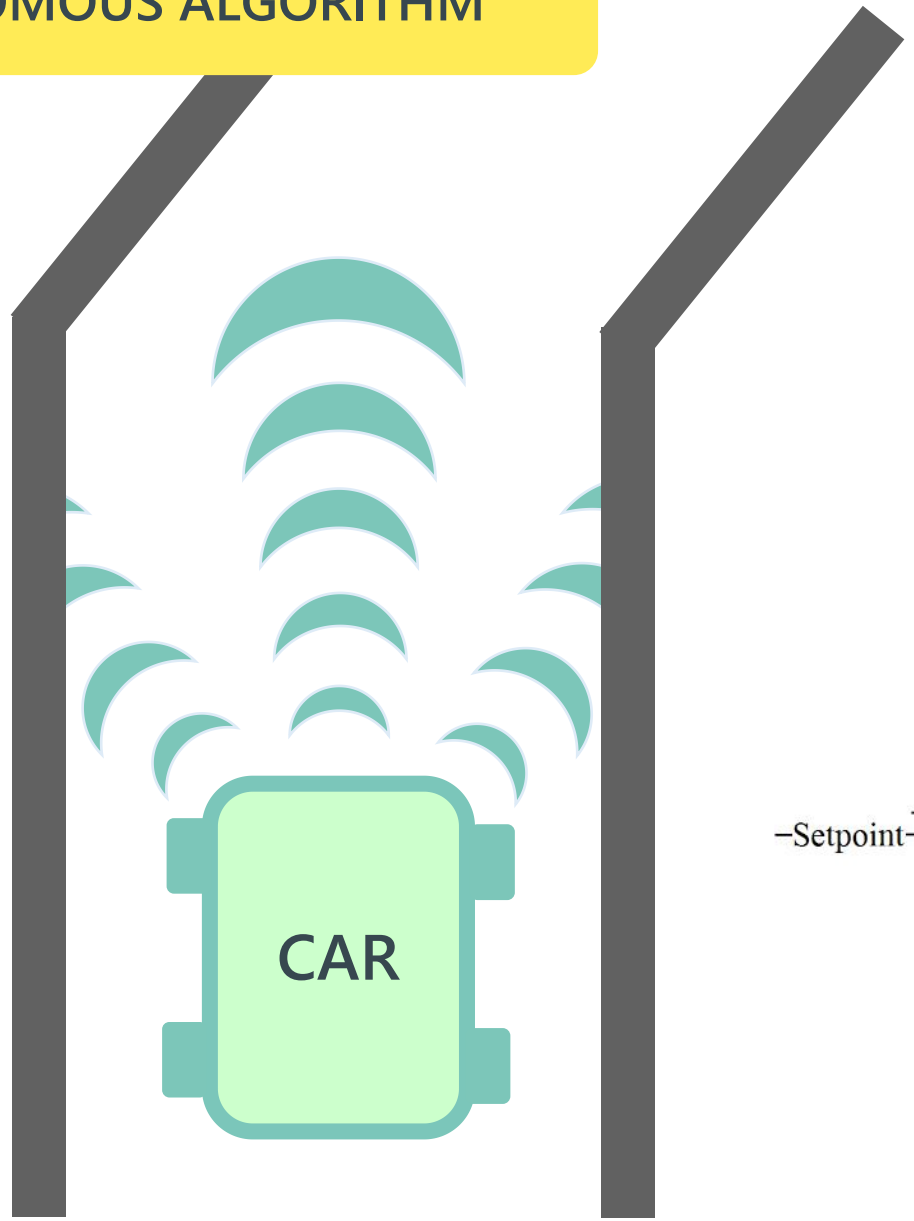

SOFTWARE
RC CAR
BT COMMUNICATION
SENSOR DATA ACQUISITION
DATA FILTERING
PID CONTROLLER
DATA INTERPRETATION
CAR CONTROL
SEND DATA / ERRORS

SOFTWARE

MOBILE APP



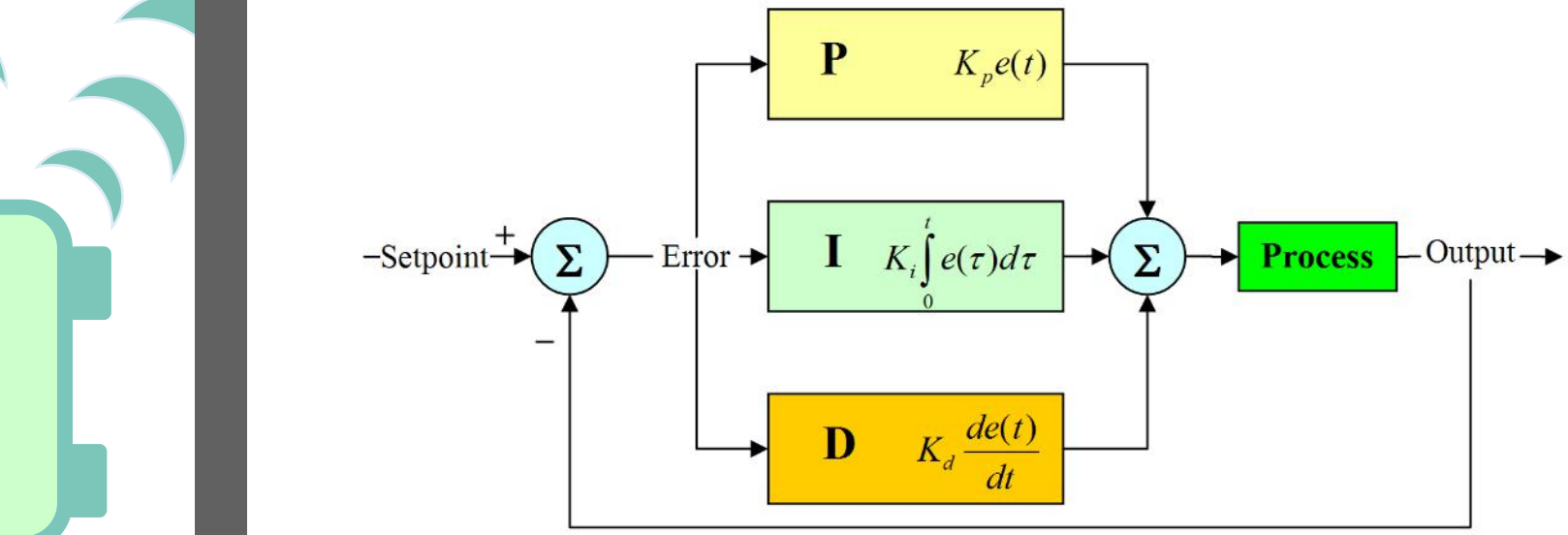
AUTONOMOUS ALGORITHM



PROPORTIONAL

INTEGRAL

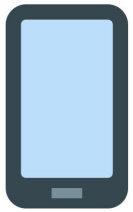
DERIVATIVE

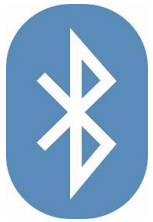


BLUETOOTH DATA TRANSMITION

BATTERY [%]
SPEED [KM/H]
DISTANCE [M]

MODE: AUTONOM / MANUAL / TEST
WHEELS POSITION
ACCELERATE / BRAKE





WHEELS POSITION [°]
DIRECTION [FW, BW, ST]
AUTONOMOUS STOP
ERROR REPORTING

BT COMM:
- UART
- 8 bit
- No parity
- 1 stop bit

SPEED SELECT
AUTONOMOUS: START / STOP
LIGHTING SYSTEM

MOBILE APPLICATION

LOGIN

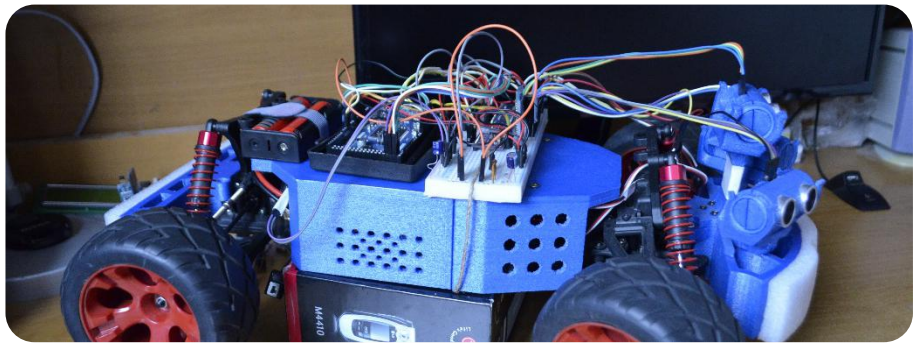
MENU

AUTONOMOUS

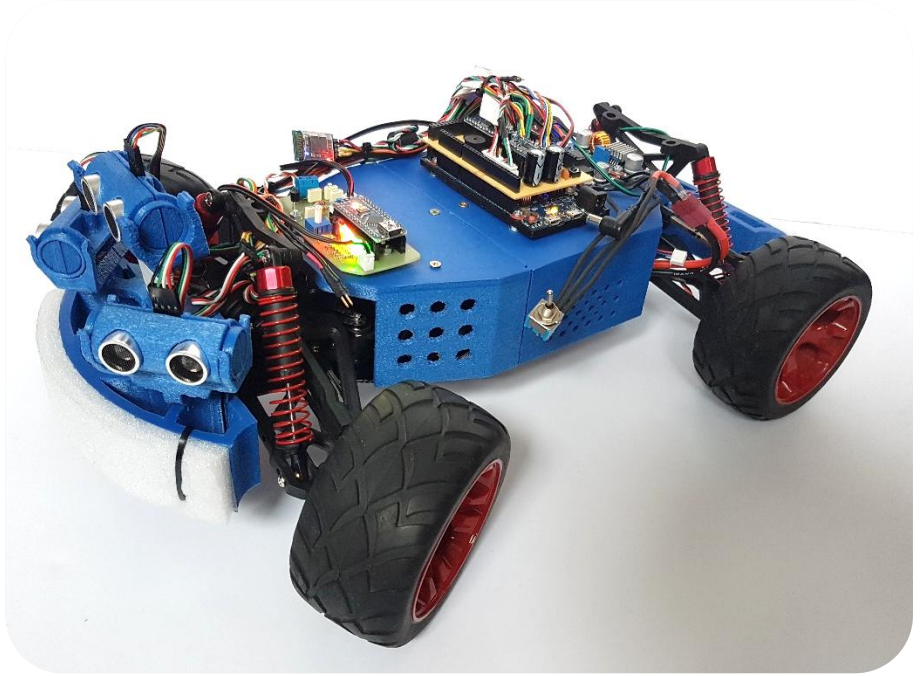
MANUAL

TEST

DIFFICULTIES

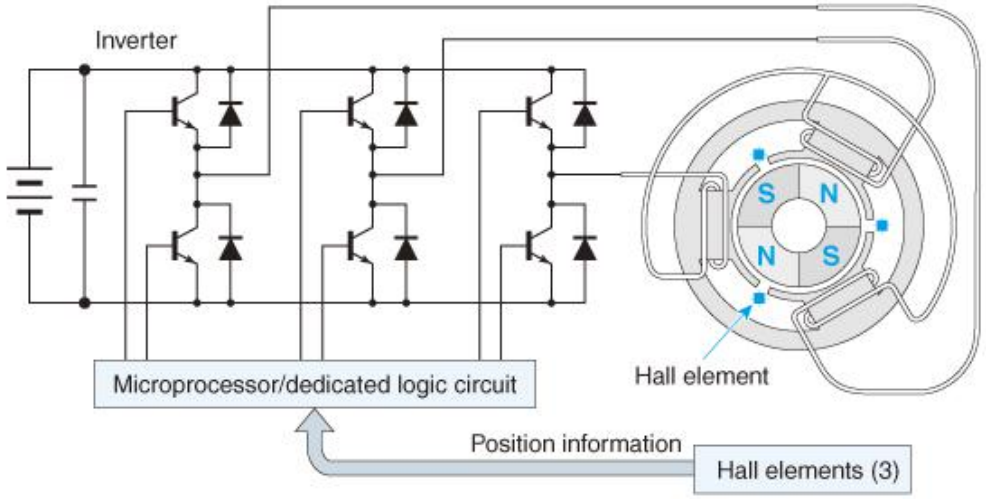


3D PRINTED PARTS



CABLE MANAGEMENT

IMPROVEMENTS



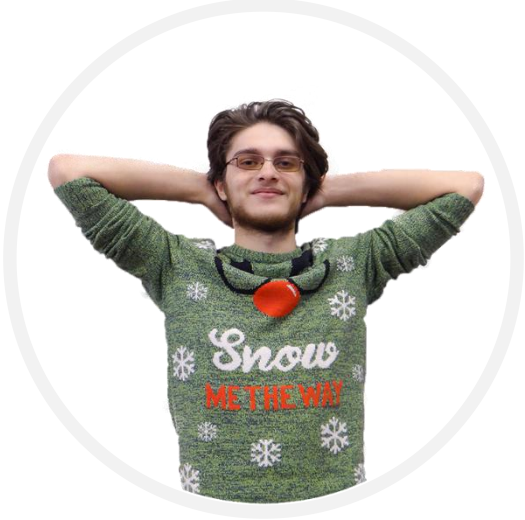
INVERTER

IMAGE PROCESSING ALGORYTHM WITH RASPBERRY PI

TEAM

ALEX

TEAM LEADER



COSMIN

MECHANICAL DESIGN

IOAN

PR & DESIGN

IONUT

SOFTWARE