Summer job at ITRL and the Smart Mobility Lab
10-minute programming of a self-driving car with Blockly

We are hiring two KTH students to do part-time work during the spring and a more focused project during summer. The total duration of the project is three months full time.

**Background:** Automated transport solutions and self-driving cars are in fast development and there are many related societal and environmental expectations and challenges. One important challenge is to secure Sweden’s competitiveness and attract young kids to engineering education. We believe that miniature self-driving cars combined with game-like simulations will stimulate and interest the young. This particular project is aiming at an interactive exhibition at Tekniska Museet in September, as part of the 100-year celebration of The Royal Swedish Academy of Engineering Sciences (IVA, Kungliga Ingenjörsvetenskapsakademien).

**The SVEA platform:** At the Smart Mobility Lab we developed a Small-Vehicles-for-Autonomy (SVEA) platform to serve as a scalable fleet of small connected and automated vehicles. In particular, the SVEA platform is built to be small, convenient, and cheap, while still being able to handle the same information signals full-sized vehicles typically experience. The platform is based on a Traxxs RC car equipped with a Nvidia Jetson embedded computing board, and sensors like multi-channel lidars, stereo cameras, HD cameras, etc.

**Project idea:** The goal of the project is to develop a user-friendly application, suitable for young students in ages 10-14, for programming a self-driving car. Similar to many smartphone games you will be guided in small steps to build a program for solving certain driving tasks. The “player’s” code will be run in a simulation environment where you can see how well it performs. After successful completion you will be able to download the code to the SVEA car and try it for real. The programming interface will (probably) use Blockly which is a library for block-based programming with a client-side editor where you can directly generate e.g., Python code. The idea is to integrate the code editor in the game application and to integrate the generated code with the simulation and SVEA code base. The project will be challenging both from a control perspective and from a user perspective. The ambition is that the application is mainly self-explanatory and robust enough to be displayed at a museum. And simple enough so that you can manage to program a self-driving vehicle in under 10 minutes.

**Qualifications:** You are a student at KTH with excellent study records and with a genuine interest to attract young kids to engineering. We will hire two persons with complementary backgrounds. One of you will have a strong background in systems and control, and with good programming skills in Python and preferably with experience of ROS. The second person will probably have a background in media technology and interaction design and should have experience in web programming in JavaScript and HTML as well as good programming skills in Python.

**Salary:** 24 000 kr/month (150 kr/h)

**Contact:** Jonas Mårtensson, jonas1@kth.se

**Application deadline:** April 20th
def sväng(riktning):
global hastighet, hinder, körriktning, position, rättvinkel

riktning = körriktning
hastighet = 30

while True:
    if hinder:
        hastighet = 0
    while not position == kör_framåt():
        sväng('höger')

def kör_framåt():
global rättvinkel, hastighet, hinder, körriktning, position

hastighet = 30

while True:
    if hinder:
        hastighet = 0
    while not position == kör_framåt():
        sväng('höger')