SLAM

Simultaneous Localisation and Mapping is a method used by autonomous systems in order to
create a virtual map for it to navigate in. Revolve NTNU Driverless uses SLAM for its
autonomous racecar getting inputs from LiDAR, Cameras, INS, GPS and other autonomous
sensors.

Revolve NTNU Driverless have for the past two years developed a factor graph based SLAM
solution built on top of the gtsam framework. The data association solution is currently based on
a variance of the probabilistic data association framework (PDA). The goal of this assignment is
to improve performance and run-time of the current implementation by; iterating on the current
design or approaching the problem in a new way.

You will be responsible for one of the most central parts of the autonomous pipeline. The SLAM
module in the autonomous pipeline interface with almost every other autonomous software
module and is critical for the race car to work as a whole. The master thesis will consist of:

- Improve performance and run time from the current implementation of SLAM.
- Having some responsibility for autonomous hardware necessary to perform navigation
  and localisation tasks such as; LiDARs, cameras and INS.

A year in Revolve NTNU is split into three parts:

1. Autumn: The design phase resulting in an approach on how to solve the problem. This
   will suffice for the specialization topic.
3. Spring/Summer: Testing of the autonomous vehicle and competitions in Europe. This will
   be an opportunity to test the SLAM code with the other autonomous systems while
   getting a chance to validate your data. This will suffice for the master thesis.

As a member of Revolve NTNU Driverless, you will get to join the organization as a regular
member while you are writing your thesis. This will allow you to reach out to the alumni of the
organization for help as well as getting access to the financial support from the organization.
You will collaborate with a competent team that will help you during the year, and you will be
working with people towards a common goal. Joining Revolve NTNU Driverless is a unique
chance to meet talented students helping you write an important Master Thesis while working
with the best technology has to offer.