

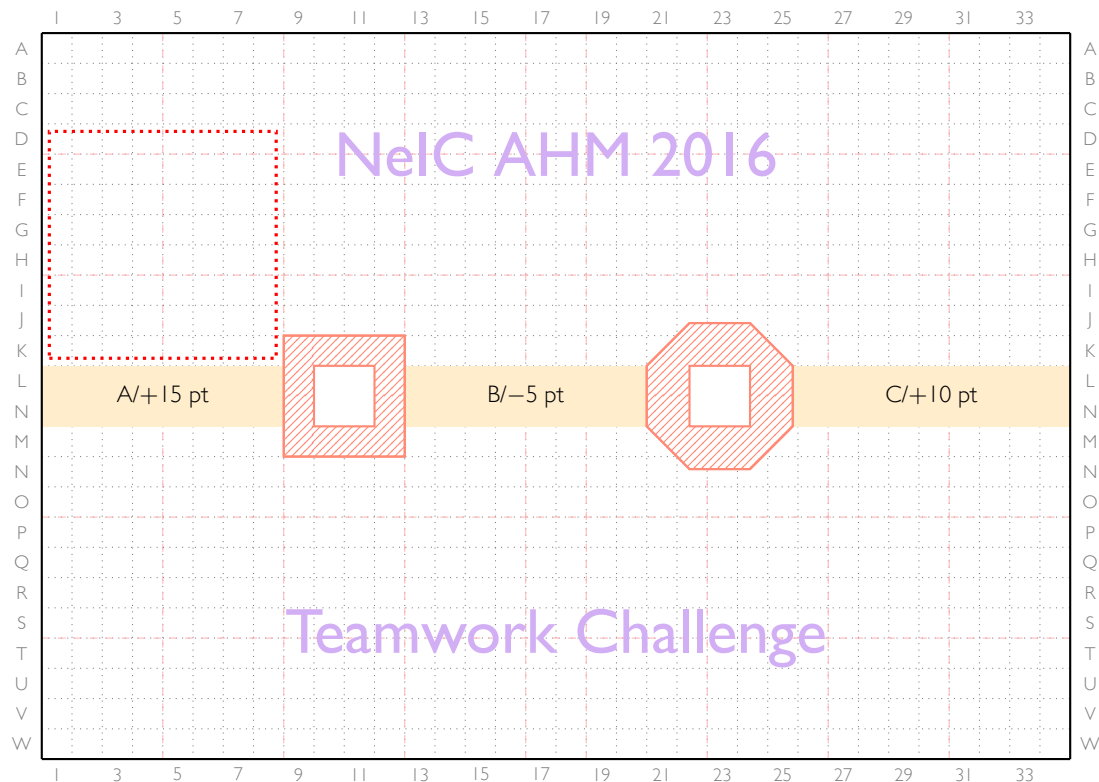
# NeIC AHM'16 – Teamwork Challenge

Chairs: Petter Urkedal & Thomas Röblitz

WWW: <http://ahm16.neic.nordforsk.org/sessions/challenge/>

We apologize that people have been lead to Skeikampen under false pretenses, but it was of the utmost importance not to keep this a secret to prevent panic in the general public. *We show a paper which predicts closing of the gulf stream and return to a new ice age in the Nordic countries, and explain this is why we are here today.* Some of us were already on an expedition the day before, others have learned how to build igloos. Once the snow and ice starts to cover the Nordic countries, we need ski tracks to keep communication open to prevent breakdown of our civilization. Some have even suggested that politicians might get lonely when they can't reach the outskirts of their countries, and, well lets stress that this is completely hypothetical at this point, they could create a new Nordic union. This is the so-called Kalmar 3 scenario.

Today we take the first steps to create autonomous vehicles to keep the tracks open while avoiding hitting igloos. We will of course take these first steps with a idealized model. To start with the simplest region, we use a flat floor, which of course is an almost exact scale model of Denmark, and a few igloos modelled in wood/paper.



## Description of the track and the challenge

The track is about 96 cm × 136 cm in size and framed by solid wooden slats of about 10 cm height. Certain areas of the track are marked (see below for a description). Inside the track are also two boxes (diagonally hatched in red color). The boxes are 10 cm high and of different size: square of 16 cm × 16 cm, and a regular octagon with each side being 16 cm long. Each box contains a quadratic hole of 8 cm × 8 cm.

Let your robot autonomously explore the terrain. It will receive points by crossing orange areas. A referee will note the sequence of crossings, e.g., A,B,C,C,A,A,C, and prune it by removing any doublings, resulting in A,B,C,A,C.

The robot starts at the red-dotted square (above the orange area marked A/+15 pt) in any direction. If your robot gets stuck or leaves the track, turn it off, place it into the red-dotted square, and turn it on again. Note, ask the referee for permission to turn it off by saying robot X got stuck or robot X left track before turning it off. The referee will swiftly reply with OK or NO.

Each competition round of the challenge lasts for 2 minutes.

## Robot construction

Your team will get all the material to construct the robot (including some basic designs you may start with). Only the supplied electronics may be used, but you can add any mechanical parts you find useful. In addition you'll need a computer with an Arduino development environment to program your robot. You can test the robot at your own track. Note, you may not change the track in any way.

## Schedule of the competition

Start building your robot now. Any construction and programming must be finished by 17:55 (today). At 18:00 the first round of the competition starts. The last round shall be finished by 18:25.