# Project

Spring 2015 / EK132

## Goal

Program an iRobot Create to successfully traverse a series of obstacles (there is a sample layout available for testing). The end of the obstacles occurs when the iRobot is blocked on three sides. The obstacle layout for testing will be provided but the final layout used in the demo will not be provided ahead of time. As a result, your code should be able to function until the end case (the iRobot being trapped on 3 sides) is met. How you develop your turning algorithm is entirely up to you.

## Robot programming

The iRobot Create is programmed in C using the WinAVR suite. A tutorial explaining how to use WinAVR is uploaded under the 'Project' folder on Blackboard. The tutorial also includes an example C program for the iRobot Create. We will walk through this example program in class. For the project, each team will need to research the codes required to successfully control the iRobot as well as gather data from the necessary sensors. We will also discuss how the sensors work and how data is transmitted to and from the iRobot.

## General Remarks

- Form groups of 3 students. If you cannot find a group, please post a note on Piazza.
- Project is somewhat open-ended on purpose; it's your job to formulate the design that meets the project specifications.
- You have a great deal of flexibility in writing your program. You should make suitable assumptions wherever necessary.
- Note that the project will involve some research on your part.
- Don't be afraid to seek help from the instructor and LA.

## Project presentation

Each team will have to present their work on Wednesday, April 29, 2015. Each team will be given 10 minutes to present their work followed by 2 minutes of questions. All members of the team have to speak during the presentation. Please sign-up for a time slot using the sign-up sheet that will be posted outside the instructors office. Note that each team is expected to attend the presentations of other teams. If you cannot make it to the project presentations of other teams, then you need to email the instructor atleast a day in advance. The project presentation should be powerpoint format and should include the following sections

- Project title and team members
- Project goal
- Design specifications
- Design functionality
- Do's and dont's

- If we got a chance to re-program the whole system from scratch ...

**Project report**
Each team needs to submit a 5-page project report before class starts on April 29, 2015. The project should include the objective, description of the algorithm and how it is mapped to the C program, description of any other project-related activities and conclusion. Do not include any C code (we'll look at your code during your project demos.).

**Demo**
Each group has to demo their project latest by 5 pm on April 30, 2015. You have to show that your iRobot can successfully navigate an unknown number of obstacles..

**Group evaluation**
Confidential emails should be sent by each student to the instructor evaluating the contribution of the other team members of his/her group. The subject of the mail should read "Project Contributions: Group X". In the body of the email, list each team member's name (other than yours) and state if the contribution was Superior, Equal or Deficient.