**AVC Report**

*ENGR 101, 2016 T1*

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**Lab day & time:**  Tuesdays 11am thru 1pm

**Abstract**

This document isaprogress report for Team 5 of the Tuesday 11am lab.

**Introduction**

As a part of the ENGR101 programme we are to complete a team challenge, the aim of which is to challenge us to work towards a common goal, as a team. The objective is to build and programme an autonomous robot capable of opening a gate, following a white line and navigating a maze.The team is provided with a camera equipped Raspberry Pi, motors and wheels. Sensors can be bought using virtual dollars. The budget is 100 virtual dollars.

**Background**

In order to build an autonomous vehicle, tasks have been separated into three catagories – hardware, software and networking. The system design has been decided by the software team and will utilize 1 x front facing IR sensor, 1 x side facing IR sensor, the Raspberry Pi’s built in camera, and two DC motors implementing differential drive.

The hardware team is to design hardware to match the needs of the software team. The team has been provided with a chasis, motors and wheels, a Raspberry Pi. Custom parts can be designed using CAD software and printed using a 3D printer. At this stage mounting brackets have been made for the IR sensors. An adjustable boom to mount the camera, and a battery housing are works in progress soon to be completed.

The software team is writing code to control the robots position and motion, responding to camera and sensor input, and then powering motors accordingly.

The network team have set up an SSH connection to the Raspberry Pi and are currently working on code to connect to and open a gate (the first obstacle in the course).

Team members are all first year engineering students, and a learing ‘on the job’ much of the time. Because of this, it can be expected that progress may be a little slow at times.

**Method**

A prototype build is near completion. The camera has been mounted temporarily while an adjustable boom is being fabricated. Mounting brackets have been made for the IR sensors. One IR sensor has been mounted facing the front. The other IR sensor has been mounted facing the left side.

3D printing is being utilized to custom build parts which can then be fitted to the chasis using nuts and bolts. There is the option of using a hot glue gun however this could get messy and would make it difficult if we need to reposition parts. It may be used when building the housing.

A battery compartment is currently being designed.

Software is also in the design phase.

**Results**

AT present the robot has yet to be tested on the terrain. However, software has been tested to a point where camera/sensor input is being received and motors are being controlled.