

# REPORT VISIT TO ROBOT PROGRAMMING WORKSHOP



**UTM**  
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18<sup>th</sup> December 2019

# **INTRODUCTION**

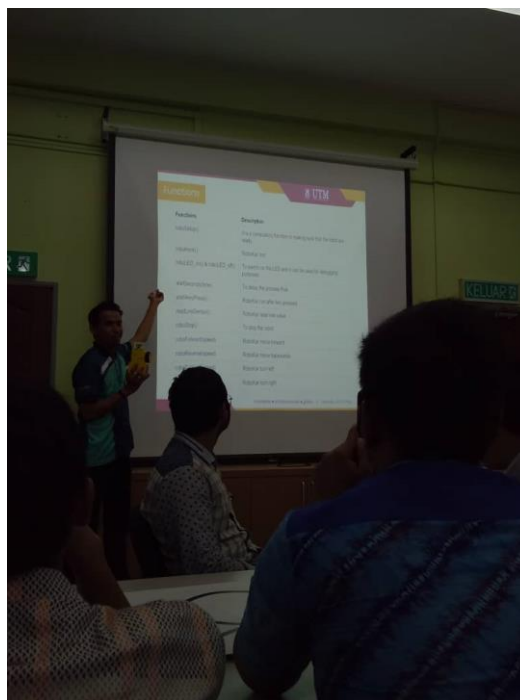
## **DETAILS ABOUT THE VISIT**

On 9th December 2019, we had attended to Robot Programming Workshop at Active Lab Learning, level 3, N28, School of computing for our second industrial visit. The workshop was held from 2p.m until 5p.m. During the workshop, all students are required to divide into 6 groups and each group need to have 1 laptop as a request from the organizer. We also were given a talk about the introduction of RoboKar and on how does the RoboKar works and implement.



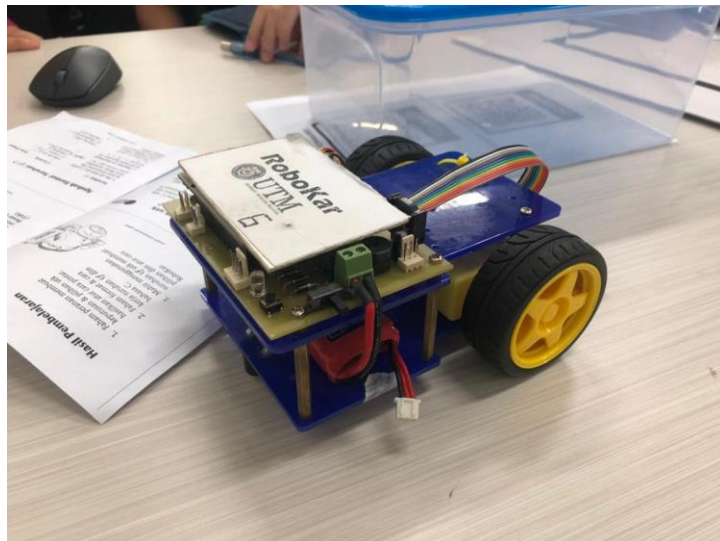
## **DETAILS DESCRIPTION OF THE WORKSHOP**

At the Robot Programming Workshop, they talk about how the RoboKar developed and being used in this day. They also introduced us with two types of mobile robots which are RoboKar and RoboTar. RoboKar is used as basic programming implementation and usually introduced to high school students as their introduction to the exciting world of computer programming. The most important challenges using RoboKar was to introduce programming and using problem-solving thinking or solution that can be done in a very short time. This will be achieved by using a mobile robot called RoboKar to gain students interest with activities where it involved programming and in a fun way. As for RoboTar, it is applied for university-level where it is mostly used by fourth-year students for their final year project. Besides, in their talked, they only focused on RoboKar because we only first-year students where we don't know much about advanced programming and we only learned the basics of programming. As the workshop goes on, each of our group was given the chances to programme our own mobile robot to execute the robot until it moves smoothly by using the sensor attached to the mobile robot. Apart from that, they also gave us instruction on how to programme the mobile robot's level by level. At the end of the workshop, all groups will be competing with each other on the fastest RoboKar and will be given prizes to winners as appreciation on taking part in the workshop.



## **DETAILS DESCRIPTION OF PROGRAMMING SESSION**

At 2.40 pm, all of us start to do the programming activity. Firstly, the moderator gave us a flash drive which contain the file of Arduino such Arduino IDE and some of library file that will use in this program. After we install the Arduino IDE, we connect our laptop to smart TV using wireless connection that able us to show the whole program to our group member. We receive a module that explain on how robocar works. From the module, we know that robocar has a few sensors that can detect line to give the robocar the ability to decide which way will they go. It could be moving forward, backwards, right and left.



How we program the robot?

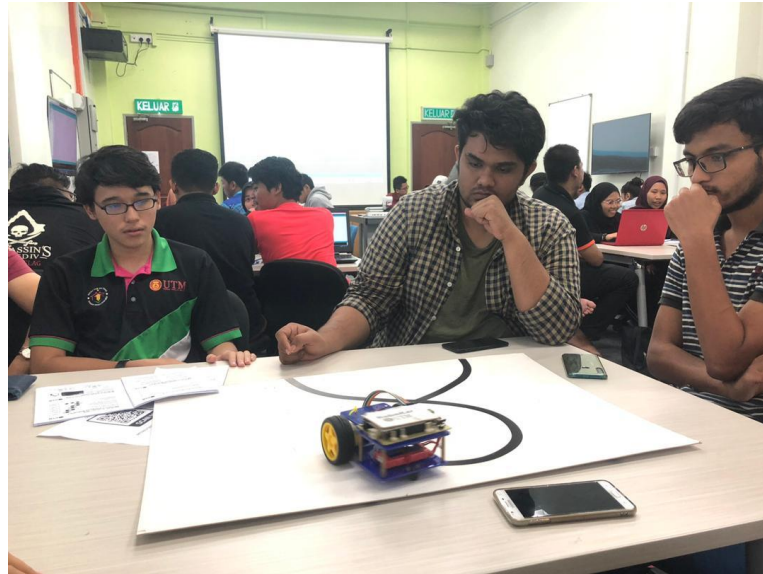
Each group only get one robocar and one Arduino cable. Before we can program the robocar, the member of robocar, gave instruction on how to program the basic movement of the robocar. We use the Arduino IDE to code the movement of our robocar. Then, the organizer asked us to test the robocar using the library file that gave us previously to see whether the robocar function properly or not. Furthermore, they ask us to make the robocar move forward and backwards using the knowledge that they taught us. First, we use serial monitor to detect which sensor is operate and which one is not. We also know the output of the sensor. By referring to the output of the sensor, we can give instruction to the robocar to move according to the sensor. For example, when the output is 1, its meant that only the right

sensor detect the line. Therefore, we instruct the robot to turn to right with the right speed which is “Medium speed” so that they robot move to the center of the line. Finally, after the robot is completely program, they give us a board of random line and challenge us to make the robocar follow the line given.

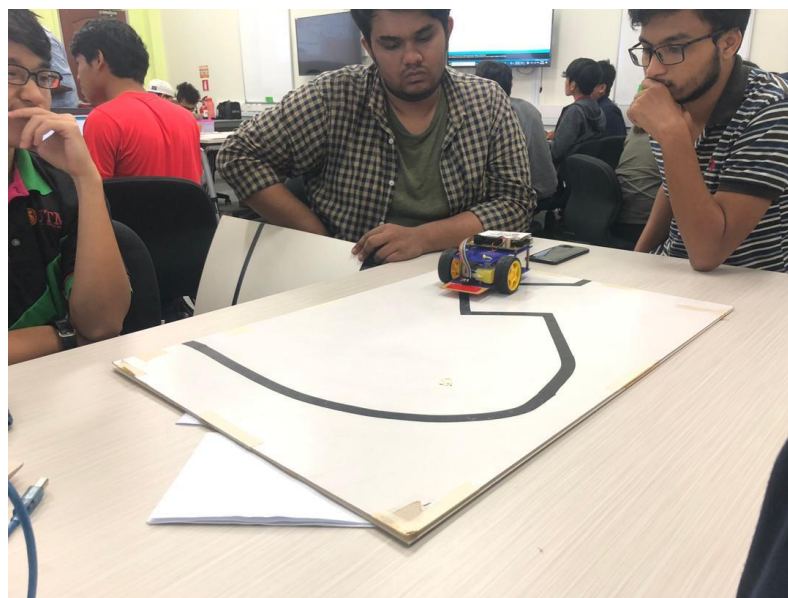


How we debug the problem?

After a few attempts, we didn't manage to make the robot to follow the line smoothly instead our robot moves like a snake going right and left continuously. Together we as a team brainstorm on how to solve the problem. Each of us give a possible suggestion on how to fix the problem. We try each one of the suggestions and edit our robocar program to run smoother on the line. Unfortunately, after fixing the problem, our robot moves to fast that they over extend the line on a sharp turn which will give us another problem that the robocar cannot detect any line after overextend the sharp turn. One of our group members came out with an idea to make the robocar reverse when they can't sense any line. By this way, the robocar will reverse when they overextend the sharp turn, making the robot to sense the line back, so it can continue to follow the line.



Each of the teams got different kind of track but our team have managed to switched with the other team's track, so that our RoboKar could experience the different tracks. If our RoboKar was having some difficulties on moving through the track, we edited our coding to improve the movement performance.



## DETAILS DECSRIPTION OF GAME SESSION

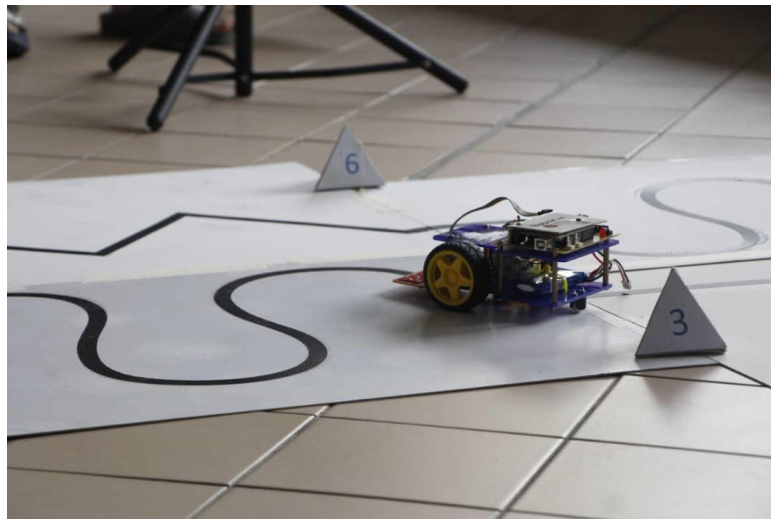


At 4.00 pm where it is the most thrilling and exciting moment of this programme, when we actually have to compete with the other teams to win the prize mentioned by the organizer. The winner will be chosen to which roboKar's team was the fastest of all. Just now all of the teams have gone through the practical session where we've tested the speed and the smooth of the roboKar movement on the tracks provided by the organizer. Each of the teams got different kind of track but our team have managed to switched with the other team's track, so that our roboKar could experienced the differences tracks. If our roboKar were having some difficulties on moving through the track, we edited our coding to improve its movement.

The competition was held at the 2<sup>nd</sup> floor lobby of N28A building, School of Computing in front of the elevator. There were two moderators who handled the competition which were Ahmad Syahir bin Abdul Hanim and Ahmad Nazri bin Abdullah. There was provided a long challenging track for our roboKar to move on it. It seems so difficult and quite challenging for all the teams. We were seating in front of the track and the big screen that shows live broadcasting of the roboKar on the track so that all of the students could watch the competition. In order to win the competition, we must abide the rules and regulations.

### Rules and Regulations of the competition :-

1. We must place out roboKar on the track and press the button once the announcement are made form the organizer.
2. It is forbidden to touch the roboKar once it is moving, unless it is authorised by the referee.
3. Each of the roboKar was given 3 minutes to complete the track provided.
4. If any groups does not comply with the rules and regulations, the team will be disqualified immediately.
5. The referee's verdict is final.



The competition went really well and all of the group were very competitive towards each other. Everyone was eager to win over the prize. All of the group have done a very good job through this whole programme. At the end of the competition, times records were taken and the organizer compared all groups time taken. The least time taken for the roboKar to completed the track will be announce as the winner. Fortunately, our group won the competition with the time record, 1 minute and 15 seconds leading the second group which the time record was 1 minute and 16 seconds. They missed only a second from our group and we've gained prizes to repay our hardworking and efforts. It was a very fun and unforgettable experience. We got to know a lot about robotics and also, we've gained some new valuable knowledge through this whole programme from the start until the end of it. Lastly, there were

and award giving and also closing ceremony. The programme was closed with a bit of a talk from our one and only Technology and Information System lecturer, Dr. Haswadi Hassan.



## **REFLECTION**

We as a group members, unanimously hope that this kind of event will be held regularly to expose the students towards the useful activities like this so that we as the Science Computer students could gain as much experience as we can by joining activities that are related to our field, that might bring benefits in our future life. This kind of activity also brought us to be as a team and work together just to make sure our roboKar was in a condition that we were expecting it to be. We also exchanged our opinions with each other with the groupmates. Nowadays, as we all know that experience are very important in order to get a job and position in any particular company as we wish to work with. If we compare a person that owned many experiences in his field with a person who got no experience regarding to his course, obviously that the company will surely accept the one with experience in his field.

We, students really hope that the committee here in UTM could help us by running as many programs as possible for the students to participate in, that will surely brings many advantages for us. It will be a very valuable medium for us to gain new knowledges and improve our potential in our industry. This event has brought us a very significant impact as we all got to know how actually the robotics works. Last but not least, we've gained new knowledges through this program, like the organizers said as we are taking Software Engineering course, we will be using this new gained experiences and knowledges on our fourth year in this course. We are very excited to apply this new knowledges in the upcoming years. This kind of event should be held more in the future, as it can brings a lot of benefits in students' life and also the future.

# **TASK FOR MEMBERS**

1. Fatin Afiqah Binti Mohd Rahim (A19EC0188)

- Recorded every detail descriptions and explanation by the presenter

2. Nuriffatish Shima Binti Norazmi (A19EC0138)

- Prepared report and coordinates report writing

3. Nabila Husna Binti Rosli (A19EC0110)

- Take photos and record videos

4. Amir Najwan Bin Noor Azam (A19EC0019)

- Gathered all the information that related about RoboKar that we've got during the Robot Programming Workshop

5. Muhammad Fikri Bin AbdulLamin (A19EC0096)

- Report planner and editor

6. Fahim Shahriyer Rahman (A18CS4040)

- Drafted all the activities plan

7. Abdullah Ibna Kamal (A18CS4044)

- Drafted all the ideas for report