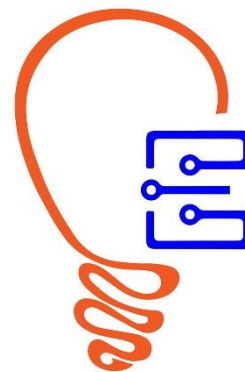




Technical Board
IIT Guwahati



ELECTRONICS CLUB

Autonomous Navigation System

GC Points – 400

12 Hostels, 7 Days, 1 Final Date – 11/10/2018

Venue – Electronics Club Room

Time – 19:00

Last Updated – 00:00 | 20/09/2018

Contact Details:

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Akshay Kumar

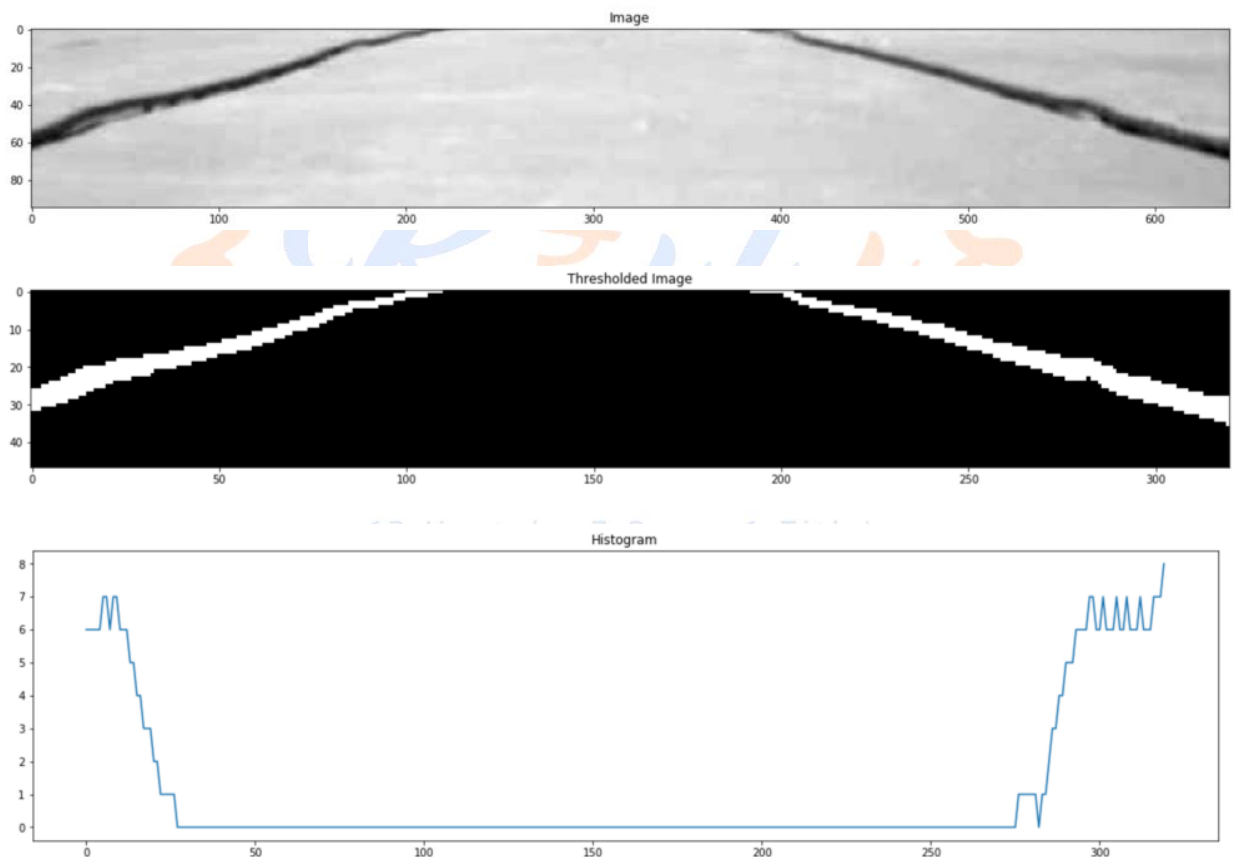
8486811036

akshay.kumar3389@gmail.com

Problem Statement:

The aim is to develop a prototype of an autonomous navigation system, able to navigate an RC car through the track and overtake any obstacles by computer vision technique. The RC car must have 4 wheels which front wheels helps the RC car to turn in right or left direction and the back wheels help the RC to move forward and backward. A webcam has to be attached on the RC car for computer vision purpose. A 2 lane track will be built to test the RC car and some obstacles would be placed on the track. Your system should be able to navigate itself and overtake all the obstacles on the track.

Sample video frame and processing steps:



Specification:

- 1) $30\text{cm} \leq \text{Width of the road}(W) \leq 40\text{cm}$, Width of the boundary can vary.
- 2) Length of car $\leq 25\text{cm}$; Width of car(excluding wheels) $\leq 20\text{cm}$.

- 3) The car should not weigh more than 2kgs.
- 4) The body of car should not use any Ready-made body parts.

Rules & Judging criteria:

- 1) Any system not based on computer vision will directly be disqualified from subsequent rounds of the competition.
- 2) Score distribution will solely depend on the performance of autonomous navigation system used and the approach used, however the bot should satisfy above mentioned specifications.
- 3) If more than one tire of the bot is out of the boundary area, the bot will be considered out of the arena.
The bot can be realigned maximum 5 times, each leading to a penalty of 30 secs. After 5 trials, the distance of the bot will be considered for judging.
- 4) For bots that complete the track, completion time will be noted.
For other cases, the maximum distance travelled by them.

****Any further change in rule will be notified beforehand****

Marks Distribution:

- 1st position => 350 points
- 2nd position => 300 points
- 3rd position => 250 points
- 4th, 5th position => 200 points
- In order to get participation points, the bot should cover a distance $\geq 10\%$ of the track length
- Participation marks => 100 points
- An additional 100 marks for documentation of project, explaining the approach used.
- 50 additional marks for reaching finish line.

Maximum marks => $350+100+50 = 500$

Please note: The above points are only for judging criteria and not GC points.

Also if feasible, a discussion will be held to properly explain the Problem Statement, Information about which will be conveyed.

--Final decision will depend on Club Secretary--

A Good design demands good compromises, thus be clear with your goal.

Following people are a part of organizing team and hence can't participate in the event in any form-

- 1) Prateek Manocha
- 2) Akshay Kumar
- 3) Balbir Singh
- 4) Tejas K Atreya
- 5) Utkarsh Singh
- 6) Tarun Yadav
- 7) Narendra Pal
- 8) Pallavi Rani

Kapili Hostel
Umiam Hostel
Umiam Hostel
Bramhaputra Hostel
Bramhaputra Hostel
Bramhaputra Hostel
Umiam Hostel
Dhansiri Hostel



12 Hostels, 7 Days, 1 Title!