ISSRD

International Society for

Scientific Research and Development

Certificate of Excellence

ESIC 2014

ENGINEERING STUDENTS INNOVATION CHALLENGE – 2014

This is to certify that the project titled

Obstacle Avoidance Using Optical Flow

with team members:

Mr. Shiv Kumar
Ms. Rachana Gupta
Mr. Narayan Singh
Mr. Manish Kumar

under the guidance of **Dr. Sangeeta Jadav** *has won*

the Best Project Award in **National** *Level category*

in the stream of **Information Technology**

from

Army Institute of Technology, Pune

in ESIC 2014 – Engineering Students Innovation Challenge 2014 organized by ISSRD.

Signature of the President

National WINNERS – ESIC 2014

Project Title: Obstacle Avoidance Using Optical Flow

Guide

Dr. (Mrs).Sangeeta Jadhav

Team Members

Shiv Kumar

Rachana Gupta

Narayan Singh

Manish Kumar

Army Institute of Technology

Description

Obstacle avoidance is critical for the safe navigation of autonomous mobile robots in unknown environments. For the avoidance we need to first detect the obstacle. Though obstacle avoidance can be done easily by using sensors or by using two cameras but practically it is not a cost effective solution.

In this project obstacle identification is done from the sequence of images captured by a single camera. The lure of using motion vision as a fundamental element in the perception of space drives this effort to use optical flow features as the sole cues for robot mobility.

Real-time estimates of image flow and flow divergence provide the robot's sense of space. We calculate the optical flow from the frames captured by single camera, which then helps us to calculate time to collide with the obstacle. The robot steers down a conceptual corridor, comparing left and right peripheral flows. Large central flow divergence warns the robot of impending collisions at "dead ends" also helps to estimate the time to collide with the obstacle. When this occurs, the robot turns around and resumes wandering. Behavior is generated by directly using optical flow-based information in the two dimensional (2-D) image sequence. The ability to support this behavior in real-time promises expanded capabilities as computational power increases in the future. The task of the avoidance algorithm is to maneuver the vehicle around the obstacle with the goal of returning to the safe path as quickly as possible.

Project Title: Propelling Tricycle Using Steering Column

Guide

Prof. S.A. Goudadi

Team Members

Shivaraj.
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Description

This is actual person sitting and driving three wheel vehicle with wheels of certain diameter, being propelled by the handle which is having the steering wheel by which the steering of the angle is possible and the same handle is pushed and pulled to the certain angle which gives the propulsion to the drive wheel axle to have the smooth drive. This system can be adopted for wheel chair or small single person drive car and also helps the disabled to put less effort and comfort for the chair drive car. This is best suitable for physically challenged people, campus movement in industry or college, or in small cities etc. This does not use any fuel and electricity.