Using Optical Flow to Avoid Obstacles in Robot Navigation

G.D. Illeperuma and D.U.J. Sonnadara
Department of Physics, University of Colombo, Sri Lanka

ABSTRACT

A virtual simulation was carried out as a pilot project to investigate the strength of optical flow in avoiding obstacles in robot navigation. The virtual environment allowed user to change parameters such as speed of the vehicle, camera focal length and light conditions easily. RML 97 was selected as the modeling language of the virtual world and virtual vehicle. Simulink was used for image preprocessing, calculating the optical flow and calculating the navigation commands. At the present level system can affectively used to navigate a robot through an obstacle filled 3D world. The drawback of the present system is when the world is symmetric and robot is heading exactly perpendicular to a face of a symmetric obstacle. More work is carried out in this direction to improve the performance.