Abstract

The human eye-brain system is responsible for the highest percentage of sensory data from the environment. A major part of this system which is unique to all predator species (including man) is the ability to perceive distance of various objects using their two eyes. This is one of the primary reasons that man and other predators have both their eyes on the same side of their head (i.e. front) unlike those in herbivore species like cows, goats, rabbits etc. The phenomenon of calculation of distance using only optical aids (namely the 2 eyes) is known as Binocular Depth Perception or stereo vision. The importance of judging distance is apparent in comprehending and manipulating a 3-D environment, which is why it is so crucial in modern
robotics. We intend to replicate the effect in software using 2 web cameras for image acquisition (instead of the eyes) using conventional/new methods in this paper. We have tried to find solution to two problems 1) Point correspondence problem 2) Stereo Triangulation Problem. After solving these two problems, all that is necessary is to combine the outputs of these two to generate a 3-D depth map enumerated in any standard unit of length or distance. MATLAB was considered as the primary development tool.

References


Index Terms

Computer Science

Emerging Trends in Technology

Keywords

Robotics  Binocular  Depth Perception  Optical aid and Sensory data