

Visual Behaviours for Binocular Navigation with Autonomous Systems

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Abstract:

Vision allows one to react to rapid changes in the surrounding environment. The ability of certain animals to control their eye movements and to follow a moving target has largely been focused in biological research. The biological control system that governs the eye movements is known as the oculomotor control system.

This article examines the problema of gaze control on a moving object manipulating the degrees of freedom of an active platform, without requiring the ability to recognise the target. Following the theoretical framework established by the active vision paradigm it has benn designed and developed the *CVC-II* hed-eye system which is an anthropomorphic head with 6 optical and 4 mechanical degrees of freedom formed by standard components.

Generality, reliability and real-time performance are the main goals of the algorithms to control each of the basic visual processes. The designed strategy of these processes are base don several aspects of biologic visual system, binocular geometry and motion decomposition.

Finally, we built a mobile platform, *Guidebot*, to experiment with some higher visuals tasks as time to contact, navigation and following a moving target.