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An Adaptive and Heterodyne Filtering Procedure for the Imaging of Moving Objects

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Abstract:

Recent experimental work on the stimulus velocity dependent time resolving power of the neural units, situated in the highest order

optic ganglion of the blowfly, revealed the at first sight amazing phenomenon that at this high level of the fly

visual system, the time constants of these units which are involved in the processing of neural activity evoked by moving objects, are -roughly spoken(cid:173) inverse proportional to the velocity of those objects over an extremely wide range.

In this paper

we will discuss the implementation of a two dimensional heterodyne adaptive filter construction into a computer simulation model. The features

of this simulation model include the ability to account for the experimentally observed stimulus-tuned adaptive temporal behaviour of time constants

in the fly visual system. The simulation results obtained, clearly show that the application of such an adaptive processing procedure

delivers an improved imaging technique of moving patterns in the high velocity range. A FEW REMARKS ON THE FLY

VISUAL

SYSTEM

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