

عنوان مقاله:

A Novel Approach for Pupil Diameter Measurement Based on Soft Computing Techniques

محل انتشار:

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نویسندگان:

F. Mokhayeri - Islamic Azad University, Mashhad Branch Mashhad, Iran

S. Toosizadeh - Islamic Azad University, Mashhad Branch Mashhad, Iran

M-R. Akbarzadeh-T - Ferdowsi University of Mashhad Mashhad, Iran

خلاصه مقاله:

In this paper, a hybrid approach for the pupil diameter (PD) measurement from the eye video is described. The proposed algorithm is composed of five main stages; data acquisition, pre-processing, edge detection, edge linking, and diameter computation. In this approach, noise reduction is performed using the type-1 fuzzy system, eye region is detected using the genetic algorithm (GA), and an effective procedure for edge detection based on a hybrid combination of interval type-2 fuzzy logic system (IT2FS) and particle swarm optimization (PSO) is presented that PSO is used for parameters optimization of IT2FS membership function. In order to evaluate the performance of proposed algorithm, a pupil videos dataset is constructed. The Proposed algorithm is tested on this dataset. The experimental results show that the combination of IT2FS and PSO can be considered as a good alternative for the edge detection, and proposed approach can be considered as a general method of pupil diameter measurement.

کلمات کلیدی:

pupil diameter; interval type-2 fuzzy logic system; particle swarm optimization, genetic algorithm

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