

DIGITAL PATHOLOGY & IMAGE ANALYSIS

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Application of neural networks to the classification of photorefraction images

Neural networks are successfully being used for many years in a large number of fields of science and technology also in medicine and virtually all fields of knowledge. Even in simple non advanced ways the results of the application of neural networks to a number of problems give good and reliable results comparable and most often better than traditional methods. In the work herein we report an application to an optometry problem: The automated classification of digital photorefraction images was obtained to characterize the refractive status of patients, mostly young children. The importance of an early evaluation of the condition of the visual system of infants is long time recognized. Non corrected optometric or ophthalmologic problems may lead to major vision and developmental non-reversible limitations in the future. Among the objective methods of refraction photorefractive techniques are specifically designed for screening young children. Over the years a number of photorefraction systems with different grades of complexity and automation were developed. One critical problem that needs to deal with in any approach of these systems is the interpretation and classification of the photorefraction images.

Biography

Manuel Filipe P. C. Martins Costa holds a PhD degree in Science (Physics) from the University of Minho (Portugal) where he works since 1985 at Physics Department teaching and performing applied research in optical metrology, applied optics, thin films and nanoscience, optometry and science education and literacy. He presented over 300 communications in international meetings and published around the same number of scientific papers, monographs and books; Editor or Member of the Editorial Board of several scientific and educational international journals. He is acting as Chairperson on 19 international conferences; Member of the Scientific Advisory Board of EOS, Member of the Board of the IberoAmerican Optics Network and Member of the Board of Stakeholders of PHOTONICS'21. He is President of the Hands-on Science Network, of the Portuguese Territorial Committee of the International Commission for Optics and of the Portuguese Society for Optics and Photonics, SPOF and Senior Member of SPIE and Fellow of European Optical Society.

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