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BIOSTATISTICS AND BIOINFORMATICS

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The theory of random sets as flexible texture descriptor for biological and medical objects and self-similarity as feature descriptors for the description of the appearances of cells and motion

Statistical methods play an important role in the description of image objects. The texture is one of the most important methods to describe the appearance of the objects such as cells, tissues and so on. While the standard statistical texture descriptor is based on the co-occurrence matrix we propose a very flexible texture descriptor based on Random Sets. The texture descriptor can describe small objects as well as large objects in fine granularity. It also has an explanation capability that allows humans to understand the nature of the texture. Self-similarity is another important method to describe the appearance of the cells as well as the motion or kinetics of the cells. This descriptor summarizes a bunch of features in one feature and gives a semantic description of what is going on. Both novel statistical descriptors are flexible enough in order to describe the different things going on with an object and they are also very fast to calculate. They can form a standard tool for different descriptions of medical and biological objects and other objects under consideration.

Biography

Petra Perner (IAPR Fellow) is the director of the IBal. She received her Diploma degree in electrical engineering and her PhD degree in computer science for the work on "Data Reduction Methods for Industrial Robots with Direct Teach-in-Programming". Her habilitation thesis was about "A Methodology for the Development of Knowledge-Based Image-Interpretation Systems". She has been the principal investigator of various national and international research projects. She received several research awards for her research work and has been awarded 3 business awards for her work on bringing intelligent image interpretation methods and data mining methods into business. Her research interest is image analysis and interpretation, machine learning, data mining, big data, machine learning, image mining and case-based reasoning.

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