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Editorial

SIBGRAPI 25th: Advances in Pattern Recognition and Computer Vision

This special issue constitutes a selection of extended contributions of original works on Pattern Recognition and Computer Vision presented at 25th SIBGRAPI - Conference on Graphics, Patterns and Images, held in 2012 in the historical city of Ouro Preto, Minas Gerais, Brazil (conference website at: www.decom.ufop.br/sibgrapi2012).

Fifteen papers were invited for this special issue and ten submissions passed through a rigorous peer-reviewing process and have been accepted for publication.

The 1st paper of this special issue presents a comprehensive overview of recent advances in supervised learning methods and introduces the k-Optimum Path Forest (k-OPF) classifier. The authors provided a theoretical background and a set of great discussions and examples to show the effectiveness and main advantages of the proposed approach.

The next four of the selected papers present contributions in object detection and tracking for computer vision applications. The second paper presents a patch-based pedestrian tracking for monocular calibrated video sequences. The proposed method explores motion prediction combined with a baseline pedestrian detection to improve targets recovery after occlusions. The third paper describes a framework for detection and tracking of soccer players using multiple stationary cameras. The authors propose a probabilistic approach to automatically estimate and track the positions of each player using particle filters. In the fourth paper the authors discuss a new strategy to improve and speedup sliding window-based object detection by reducing the search space with a region selection method over multiple scales. The fifth paper presents a method to detect cars in a sequence of images collected from static and dynamic cameras. A mixture of deformable part models representing a car model is created using a set of static images samples.

The last five selected papers discuss pattern recognition applications based on Support Vector Machine (SVM) classifiers. The sixth paper presents a framework for selection and fusion of classifiers based on SVM and exploring a series of diversity measures analysis. The proposed framework was favorably compared to state-of-the-art ensemble approaches. The seventh paper explores SVM classifiers to detect frontal human body poses and uses decision forest for gesture recognition based on key poses. The feature space is defined using an angular representation of fifteen skeleton joints and a pose kernel distance is adopted as confidence measure. The eighth paper proposes SVM-based methods for searching people in a database of face images using visual dictionaries, which combine describable visual attributes and a representation of low-level features for face description. The ninth paper presents a new motion descriptor in video based on orientation tensor, which uses optical flow and tridimensional histogram of gradients information. The performance of the proposed descriptor was evaluated using a SVM classifier applied on a collection of video datasets. The last paper, the SIBGRAPI 2012 best student paper, discusses the problem of identifying correspondence between an acquired image and its respective acquisition device, known as image source attribution. The authors introduce a feature generation approach for open set classification and a method for adjusting the decision boundary of an SVM classifier.

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