



BIOLOGICALLY-INSPIRED VISUAL ATTENTION FEATURES FOR A VEHICLE CLASSIFICATION TASK

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Abstract- The continuous rise in the number of vehicles in circulation brings an increasing need for automatically and efficiently recognizing vehicle categories for multiple applications such as optimizing available parking spaces, balancing ferry loads, planning infrastructure and managing traffic, or servicing vehicles. This paper explores the use of human visual attention mechanisms to identify a set of features that allows for fast automated classification of vehicles based on images taken from 6 viewpoints. Salient visual features classified with a series of binary support vector machines and complemented by a dissimilarity score achieve average classification rates between 94% and 97.3% for five-category vehicle classification depending on the combination of viewpoints used. The viewpoints that make the most important contribution to the classification are identified in order to decrease the implementation cost. The evaluation of performance against other feature descriptors and various approaches for vehicle classification shows that the proposed solution obtains results comparable to the best ones reported in the literature.

Index terms: Visual attention, saliency, machine learning, support vector machines, vehicle classification, dissimilarity, feature extraction.