Particle Swarm Optimization and Support Vector Machine for Vehicle Type Classification in Video Stream

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Abstract

Detection, tracking, and classification of vehicles is the most important stage of computer vision applications in Intelligent Transportation Systems. In this study, vehicle detection was carried out using a background subtraction method in which the background was modeled using frame differencing background subtraction and contours as models of objects. The extraction of geometric features from the vehicle contour is used as input to Support Vector Machine (SVM) with the Radial Basis Function (RBF) kernel to classify vehicle types in combination with particle swarm optimization (PSO) to select optimal C and gamma parameters. This study resulted in a sensitivity of 85.71%, specificity of 83.33%, accuracy of 85%. With an average accuracy for object tracking is 90%.

References

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Index Terms
Keywords

Intelligent Transport System, Background Subtraction, Particle Swarm Optimization, Support Vector Machine, Contour Detection, Video.