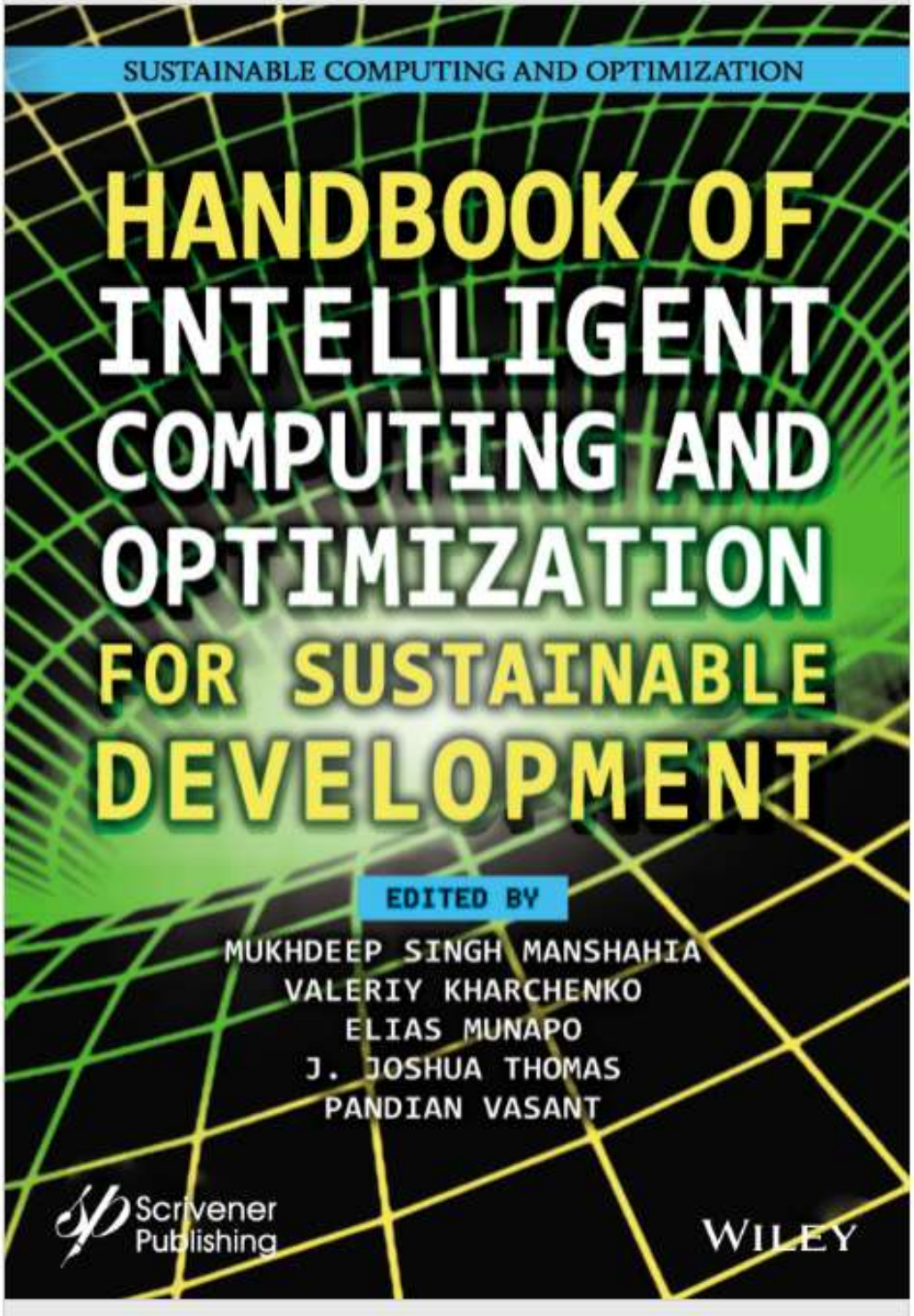
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HANDBOOK OF INTELLIGENT COMPUTING AND OPTIMIZATION FOR SUSTAINABLE DEVELOPMENT
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Chapter 36

Gender Classification Using Multispectral Imaging: A Comparative Performance Analysis Between Affine Hull and Wavelet Fusion

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Summary

Gender classification which is a soft biometric trait has been shown significant attention in biometric literature especially using visible spectrum range. However, there is limited work focusing toward the near-infrared and multispectral imaging spectrum in this direction. Further, considering the potential of multispectral imaging for robust biometric performance, there is a need to understand the methods that can fully utilize the spectrum band information for performance analysis study between the Affine hull subspace learning method and wavelet average fusion method, from which we further learn the extracted features of Affine hull and wavelet fusion method independently using Support Vector Machine (SVM) classifier. Toconduct this study, we have employed our multi-spectral facial database collected for 145 subjects in nine narrow spectrum bands amounting to 78,300 sample spectral band images. The extensive experimental results are carried out across six different illumination and using three different feature extraction methods for gender classification. To have a fair comparison, results are repeated for 10 different trials of random selection of the training and the testing samples for both the methods. The average classification obtained indicates the superiority of wavelet fusion method over Affine hull subspace learning method in successfully extracting the unique characteristic information from spectral bands for improved performance.