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Title :
Human Body Radiation Wave Analysis and Classification for Gender and Body Segments Recognition

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This thesis presents a novel analysis and classification of human radiation wave for gender and body segments recognition. The human body has been shown to emit radiation into space surrounding their body. The research study frequency radiations at 23 points of the human body segregated into body segments of Chakra, Left, Right, Upper body, Torso, Arm and Lower body. Initially, the characteristics of frequency radiation are examined using statistical tools to find the correlations between variables. Multivariate analysis of variance (MANOVA) is employed to compare the differences of frequency radiation characteristics between genders. Then, the classification algorithm of *k*-nearest neighbor (KNN) is employed to discriminate between genders, and between body segments. The classifiers are evaluated through analysis of the performance indicators applied in medical research of accuracy, precision, sensitivity and specificity in receiver operating characteristics (ROC) analysis. The findings obtained from this research show that the wave radiation characteristics of a male and a female human body are different. The proposed technique is able to distinguish gender and classify body segments, and it is justified using MANOVA statistical tests. The individual features of gender differences using analysis of variance forms a significant outcome on 13 points that are located close to the forehead, left and right side of abdomen, palms, arms, shoulders and head. In KNN classification, the outcomes for the classifiers are consistent with the MANOVA. For gender recognition, the classifiers have successfully differentiated male from female human body, and achieving a performance of 100% for accuracy, sensitivity and specificity. For body segment recognition, the classifiers are also able to distinguish between the body segments producing 100% accuracy in classifying of Chakra, Left and Right, whilst 93.75% accuracy is obtained in classifying of Upper body, Torso, Arm and Lower body. The sensitivity and specificity computed for body segment recognition are found to be more than 80% indicating a good classification performance. The outcomes of this study demonstrate that a male and a female human body, and also the different body segments, have different frequency radiation characteristics. The finding offers new opportunities in research and application based on human body radiation such as biometrics and surveillance systems.