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Assignment Report: Human Gait Recognition Using Deep Learning

Assignment # 2

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Human Gait Recognition Using Deep Learning

Problem Statement

In HGR, the walking style of a person is utilized for recognition or behavioral analysis. This is also used to diagnose medical problems. There are many methods introduced by researchers for HGR but faced the degradation of performance due to different factors such as clothing variations, view variations, and different carrying conditions. Some techniques perform well on a specific dataset but their performance is minimized on other datasets so the generalization is not achieved (Mehmood et al., 2024; Rani & Kumar, 2024). Many methods are based on multiple streams and perform well but their computational cost is high so cannot be used in real-world environments (Yousef et al., 2023). In some methods feature selection approach is employed but fails due to relevant information loss (Arshad et al., 2022; Mehmood et al., 2022). Furthermore, the methods that use feature optimization and data augmentation are less flexible (Saleem et al., 2021). This research aims to design an HGR method that overcomes these problems and offers efficiency, adaptivity, generalizability, and flexibility.

Research Objectives

1. To expand the feature extraction and combination of methods with the help of spatial and temporal features and also ensure the recognition rate and computational efficiency.
2. To develop a strong HGR method that effectively overcomes the problems of variation in angle, clothing, and background variability and also ensures generalizability to improve the system performance.
3. To evaluate the efficacy of the single and multi-stream methods by extracting such features that are discriminative, conducting analysis to adapt the trade-offs in terms of performance, flexibility, and computational cost of the HGR.

4. To examine the impact of feature selection and optimization techniques, such as entropy or skewness-based feature selection, on the recognition rate and stability of the HGR method by reducing feature loss and enhancing outcomes
5. To carry out a comparison of the HGR method performance utilizing multiple datasets, such as CASIA-A, B, and C, to ensure its generalizability and robustness in real-world environments.

These objectives will offer such an HGR method that is generalized. Optimized, robust, and adaptable.

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