

# UNIVERSITY OF SOUTH FLORIDA

## *Defense of a Master's Thesis*

*A Study of Deep Learning Silhouette Extractors for Gait Recognition*

*by*

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*For the MSCS degree in Computer Science*

*Gait recognition has gained importance in biometrics for identifying a person. It is performed by analyzing the gait features extracted from a video of a walking person. Gait features can be represented using silhouettes, pose elements, 3d human body features, or the combination of any of the above features. Most gait recognition algorithms use silhouette data for modeling. Therefore, the quality of the silhouettes is crucial for achieving better recognition results. Many previous works have used the silhouettes given with the dataset for developing a gait model. In this work, we will test the performance of different background subtraction algorithms on the gait recognition problem. We compared background subtraction methods: Background Matting, Hybrid Task Cascade, Mixture of Gaussians, Fully Convolutional Networks, and DeeplabV3. We performed the experiments on CASIA-B and USF HumanID datasets, which were collected indoors and outdoors, respectively, using static cameras. The CASIA-B dataset considers changes in two covariates: view angle and walking surface, and USF HumanID dataset considers changes in five covariates: change in view angle, change in the walking surface, change in shoe type, with or without the briefcase, and change in time. This variation in the datasets would give us an idea of how background subtraction methods perform under various conditions. The efficacy of these silhouette extractors is evaluated on five state-of-the-art gait recognition algorithms: GaitSet, GaitPart, GLN, OpenGait Baseline, and GEI-Net by comparing Rank-1 identification accuracies, and their statistical significance is shown by two-way ANOVA analysis. We observed that the silhouettes generated by matting had achieved a minimum of 1.34\% increase in all the experiments.*

*Thursday, October 6th, 2022*

*12:30 PM*

*ENB 313*

**THE PUBLIC IS INVITED**

*Examining Committee*

*Sudeep Sarkar, Ph.D., Co-Major Professor*

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