

# Segmentation Techniques based on Background Subtraction and Supervised Learning: A Comparative Study for Images of Mice and Human Skins

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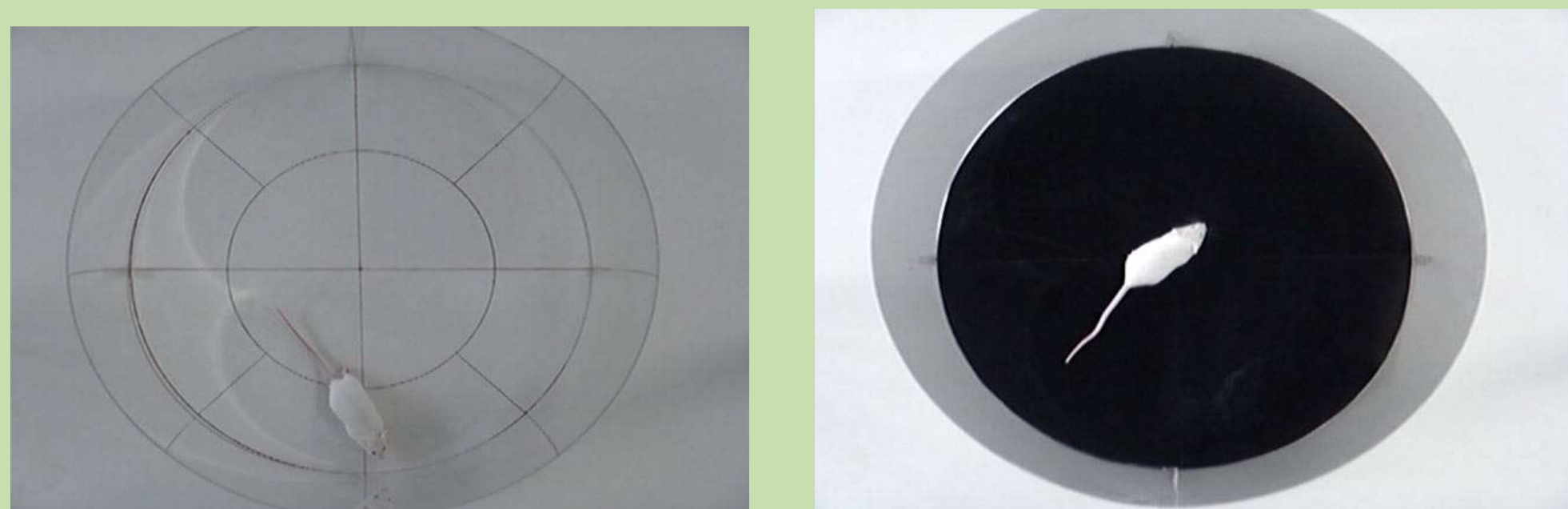
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*This paper presents a comparison between two image segmentation approaches based on background subtraction and supervised learning. Real images from two important issues, which have been studied by several computer vision research groups, were used in our experiments: namely, sign language recognition and mouse behavior classification. Performance results, using accurate rate, Jaccard coefficient, Yule coefficient, relative area error and misclassification error metrics, are presented.*

## Experimental Setup

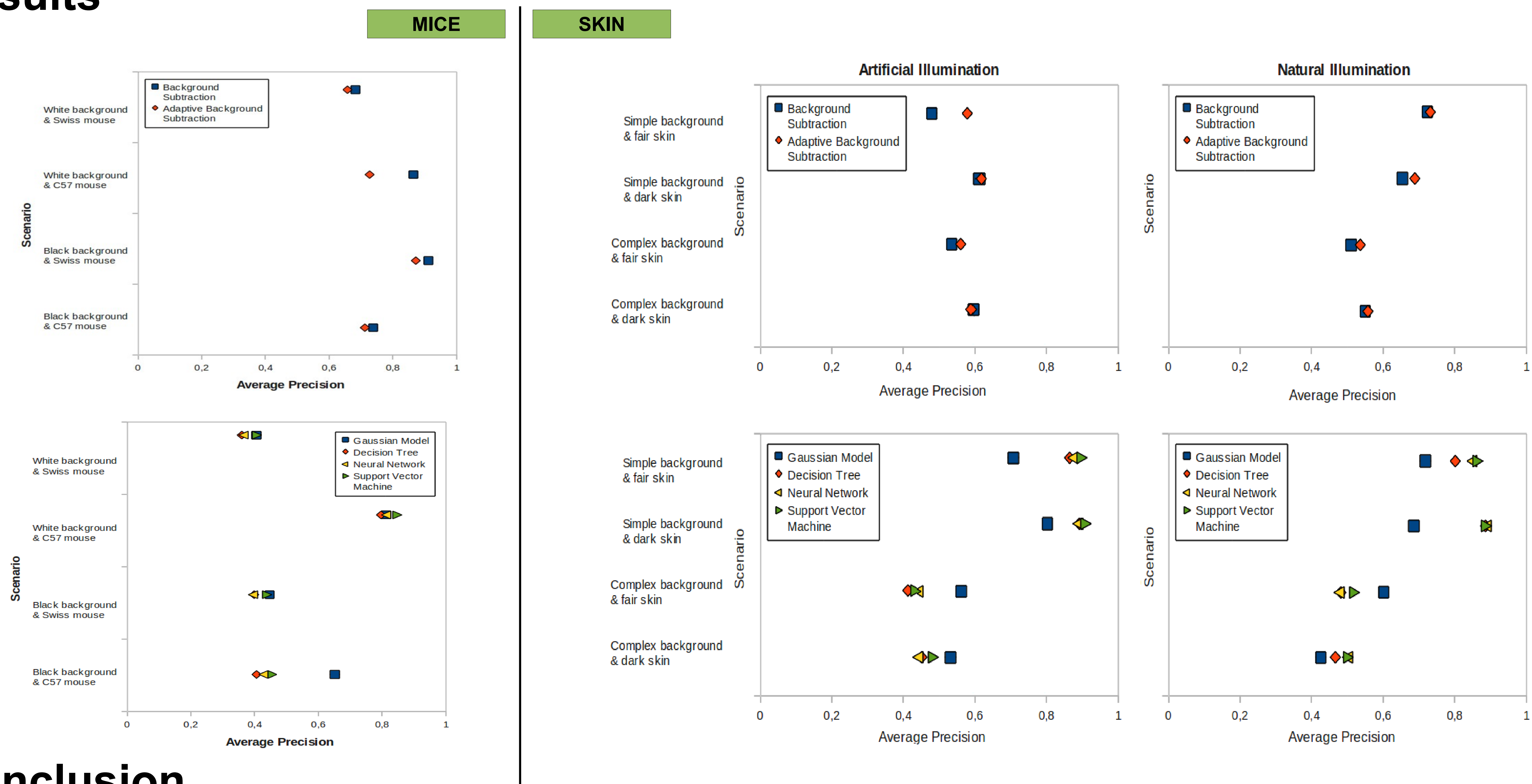
The **Mouse Behavior dataset** consists of two behaviors: vertical exploration and spatial locomotion. 640 x 480 images are taken of the species Swiss and C57 within a circular arena, resulting in a total of 40 images. Swiss are white haired animals and C57 black haired animals. We analyze the ability of segmentation algorithms in tasks where foreground objects are strongly correlated with background. In this particular case, the animal is the same color as the background.



The **Brazilian Sign Language database** contains 240 images of postures that explore different gestures separated in 10 classes. The size of images is 800 x 600 pixels. Images are taken from 6 different signers with distinct skin tones. Each pose is captured with static and complex backgrounds, in this case within a laboratory with artificial illumination. Further, the remaining 120 images are taken in outdoor environments with natural illumination and complex background.



## Results



## Conclusion

Experiments strongly suggest that the background subtraction approach is better for mice images, mainly in high contrast images. From the gesture recognition results, supervised learning approach achieved better results for both illumination conditions, in specific support vector machines.