

Project Title: Automated Yoga Pose Classification

Area of Research: Computer Vision

Problem Statement: Yoga pose classification plays a crucial role in various domains, including fitness, physical therapy, and sports training. Rapid and accurate identification of yoga poses is essential for effective practice monitoring, correction of postures, and personalized training programs. However, manual classification of yoga poses based on visual inspection can be time-consuming, error-prone, and challenging, particularly when dealing with a wide variety of poses and subtle differences between them. The goal of this project is to correctly identify different yoga poses in an automated manner using neural network, achieving high accuracy, robustness to varying appearances and angles, and real-time deployment capabilities.

Dataset:



Figure 1. Example images of Yoga-82 dataset, each line represents a type of pose of yoga.

Yoga-82 dataset [1] is a benchmark dataset for yoga pose detection. The details about the dataset can be found in [1] and be downloaded from the URL given below:

Dataset URL: <https://neurohive.io/en/news/yoga-82-new-dataset-with-complex-yoga-poses/>

Task: To develop an automatic yoga pose recognition system using neural networks and deep learning that provides high accuracy, robustness to varying appearances and subtle differences between different yoga poses, and speed sufficient for real-time deployment in practical applications.

Relevant Papers

[1]. Verma, M., Kumawat, S., Nakashima, Y., & Raman, S. (2020). Yoga-82: a new dataset for fine-grained classification of human poses. In *Proceedings of the IEEE/CVF conference on computer vision and pattern recognition workshops* (pp. 1038-1039).

[2]. Garg, S., Saxena, A., & Gupta, R. (2023). Yoga pose classification: a CNN and MediaPipe inspired deep learning approach for real-world application. *Journal of Ambient Intelligence and Humanized Computing*, 14(12), 16551-16562. <https://link.springer.com/article/10.1007/s12652-022-03910-0>

[2]. Dittakavi, B., Bavikadi, D., Desai, S. V., Chakraborty, S., Reddy, N., Balasubramanian, V. N., ... & Sharma, A. (2022). Pose tutor: an explainable system for pose correction in the wild. In *Proceedings of the IEEE/CVF conference on computer vision and pattern recognition* (pp. 3540-3549).

[4] Yadav, S. K., Agarwal, A., Kumar, A., Tiwari, K., Pandey, H. M., & Akbar, S. A. (2022). YogNet: A two-stream network for realtime multiperson yoga action recognition and posture correction. *Knowledge-Based Systems*, 250, 109097. <https://www.sciencedirect.com/science/article/pii/S095070512200541X>