

☐ Yoga AI Setup Documentation

1. Introduction to Deep Learning Models:

- Convolutional Neural Networks (CNNs) are highly proficient in understanding images but typically only analyze pictures, not videos.
- The Y_PN-MSSD model is introduced as adept at recognizing yoga poses from videos, utilizing TFLite Movenet to assess pose correctness.

2. Components of the Model:

- Pose-Net functions akin to a detective, identifying joint positions in images or videos to determine body parts' locations.
- Mobile-Net SSD aids in locating individuals in videos, crucial for identifying yoga practitioners.
- The model is trained extensively using diverse yoga pictures and videos to recognize and assess yoga poses accurately.

3. Model Functionality:

- Feature extraction and computation for each frame are performed, followed by pose recognition and feedback generation for categorizing yoga poses.
- The model's efficacy is tested using high-performance computing resources and achieves a remarkable accuracy of 99.88% after rigorous training and testing.

4. Evaluation and Performance Analysis:

- Evaluation metrics such as True Positive Rate, False Positive Rate, precision, recall, and accuracy are employed, alongside a confusion matrix, to assess model performance.
- The model is compared favorably to an existing Pose-Net CNN model, demonstrating superior performance in various metrics.

5. User Interface and Interaction:

- The model's user interface allows users to select yoga poses and receive real-time feedback on pose correctness.
- It provides visual cues, such as changing line colors, to indicate correct or incorrect poses, resembling a virtual yoga instructor guiding practitioners.

References - <https://www.mdpi.com/2227-9032/11/4/609>