A PROJECT REPORT
ON

"FORM PERFECTOR"

SUBMITTED TO THE UNIVERSITY OF PUNE

IN THE PARTIAL FULFILLMENT OF THE REQUIREMENTS

FOR THE AWARD OF THE DEGREE

OF

B.E. (INFORMATION TECHNOLOGY)

SUBMITTED BY

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UNDER THE GUIDANCE OF

MS. P. N. SHEJWAL

DEPARTMENT OF INFORMATION TECHNOLOGY

PES's
MODERN COLLEGE OF ENGINEERING,
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* 2023-202

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CERTIFICATE

This is to certify that the project entitled

"FORM PERFECTOR"

SUBMITTED BY

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is a record of bonafide work carried out by them under the respected supervision and guidance of the **MS. P. N. Shejwal** and it is approved for the partial fulfillment of the requirement of Savitribai Phule Pune university, Pune for the award of the degree of Bachelor of Engineering (Information Technology)

MS. P. N. Shejwal   Prof. Dr. Mrs. S. D. Deshpande   Dr. Mrs. K. R. Joshi
Guide   Head of the Department   Principal

Date:
Place: Pune

Acknowledgments

Achieving our goals greatly depends on the guidance we receive. No task can be successfully completed without the right help from experts in the field. I want to express my thanks to those who played a crucial role in making our project successful.

I take great pleasure in acknowledging and expressing gratitude to everyone who made it possible for me to complete this project successfully. A special thanks goes to my project guide, MS. P. N. Shejwal, for her consistent support, guidance, and encouragement throughout the project.

I'd also like to extend my sincere thanks to Prof. S.S. Deshpande, the Head of the Information Technology department, for his valuable help and guidance. My gratitude further extends to the entire teaching staff for their guidance during project presentations. A big thank you to our respected Principal, K.R. Joshi, for the ongoing support and guidance.

Abstract

Home-based workouts are known to have significant health and fitness benefits, but it could be dangerous if not performed with proper posture. This could be due to a lack of sufficient training and bad habits, or the inability to afford a personal trainer to fix the individual's posture. With the current Artificial Intelligence technology, we are now able to achieve workout analysis by using computer vision approach without any involvement of personal trainer. This report discussed the approach of keypoint detection, human pose estimation and pose analysis that will be utilized to produce the proposed project through Rapid Application Development (RAD) methodology, which will monitor these procedures phase by phase. Pretrained model from MediaPipe was chosen as the main human keypoint detection, and various machine learning algorithms such as Linear Regression and Random Forest were studied to find the suitable algorithm to be implemented in detecting and analyze home workout postures. Furthermore, this research also studies on geometrical approach to determining proper and improper posture for analysis. These approaches were then compared to see which will produce the best results and user experience. Since machine learning approach does not produce the best result due to lack of training data and variety of other factors, the geometrical approach was chosen as the final approach before implementing it into desktop application.

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