YOGA Master

Team 16

Yu-Ching Chang
Matthew Chang
TABLE OF CONTENTS

01 Abstract
02 Introduction
03 Method
04 Experiments
05 Demo
06 Conclusion
01

Abstract
Abstract **Yoga Master**

- Yoga Instructor are expensive.
- Hard to check your form when practice by yourself
- Use Computer Vision to help users practice Yoga at home by themselves
02 Introduction
Introduction Mediapipe

- Mediapipe provides ML solution for human pose tracking.
- Identifies 3D landmarks of user (i.e. joints, elbow, knee, etc.)
Method
Method: Landmarks

- Capture 3D landmarks of user using OpenCV and Mediapipe
- Focus on 4 landmarks (knee, hip, shoulder, elbow)
- Train classification model to identify Yoga poses using scikit-learn
- Logistic Regression, Ridge Classifier, Random Forest, Gradient Boosting were used for classification
Method: **Score using Yoga pose**

- Compare the 3D landmarks of standard pose vs. user's pose
- Score using cosine similarity
- Input a video or camera footage of user doing yoga, the program will first identify what Yoga pose the user is trying to perform, then score the pose based on cosine similarity
Experiments Classification

<table>
<thead>
<tr>
<th>Test Data</th>
<th>Logistic Regression</th>
<th>Ridge Classifier</th>
<th>Random Forest Classifier</th>
<th>Gradient Boosting Classifier</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accuracy</td>
<td>0.97</td>
<td>0.98</td>
<td>0.98</td>
<td>0.94</td>
</tr>
</tbody>
</table>

Pie chart: 70% Train Data, 30% Test Data

Bar chart: No. Pics for Down Dog, Plank, Feathered..., Warrior Two, Warrior Three
**Experiments Grade (Down dog)**

\[
\text{Cosine - Similarity}(x, y) = \frac{x \cdot y}{|x| \cdot |y|}
\]
Experiments Grade (Feathered Peacock)

- Knee: $180^\circ$
- Hip: $180^\circ$
- Shoulder: $180^\circ$
- Elbow: $90^\circ$

Scores:
- Score: 46.0
- Score: 71.0
- Score: 92.0
05 Demo
Demo Down Dog
Demo Feathered Peacock
Conclusion
Conclusion

✧ The yoga pose can be scored based on important joint angles.

✧ The yoga poses can be correctly classified.

✧ This project can be applied to give reference indicators when people want to practice yoga independently.
Thanks!

CREDITS: This presentation template was created by Slidesgo, including icons by Flaticon, and infographics & images by Freepik