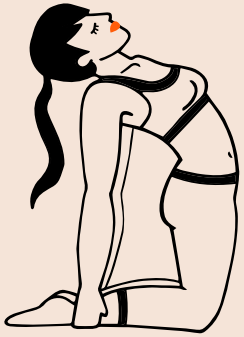
YOGA Master



Team 16

Yu-Ching Chang
Matthew Chang

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01

Abstract

Abstract Yoga Master

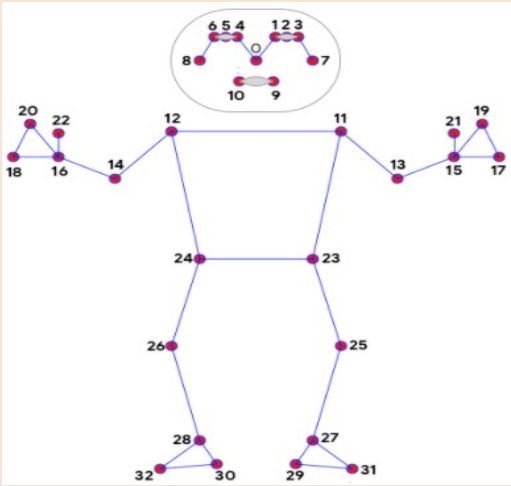
- **Yoga Instructor are expensive.**
- **Hard to check your form when practice by yourself**
- **Use Computer Vision to help users practice Yoga at home by themselves**

02

Introduction

Introduction Mediapipe

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



03

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

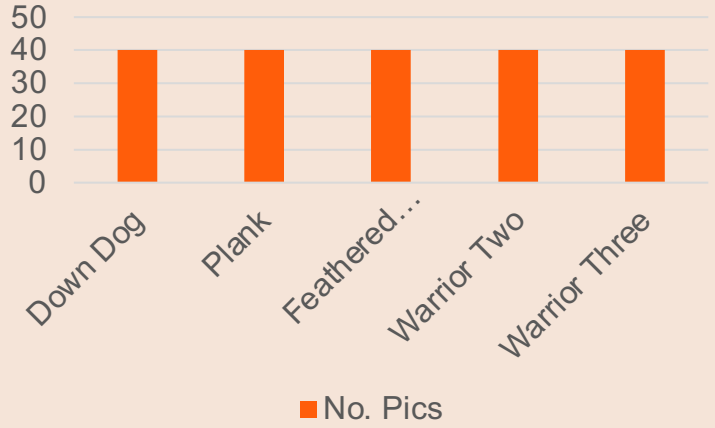
Method: Score using Yoga pose

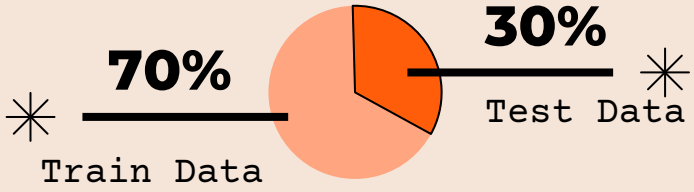
- Compare the 3D landmarks of standard pose vs. user's pose
- Score using cosine similarity
- Input a video or camera footage of user doing yoga, the program will first identify what Yoga pose the user is trying to perform, then score the pose base on cosine similarity

04

Experiments

Experiments Classification

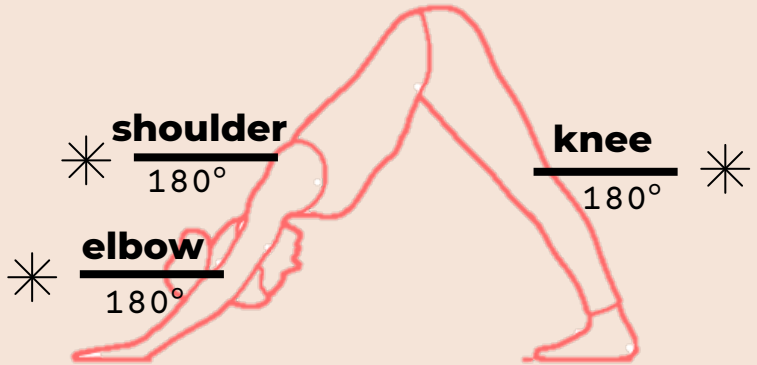


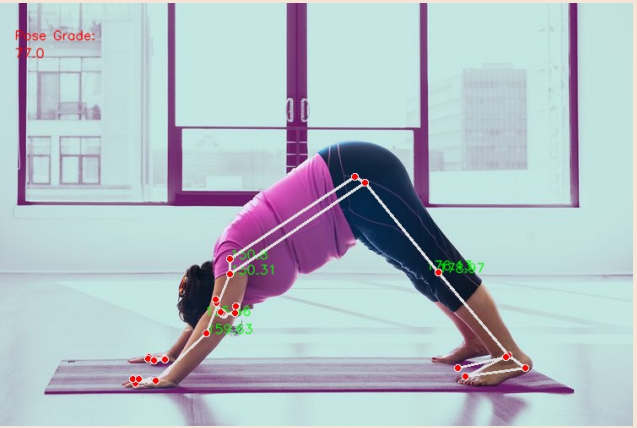


Test Data	Logistic Regression	Ridge Classifier	Random Forest Classifier	Gradient Boosting Classifier
Accuracy	0.97	0.98	0.98	0.94

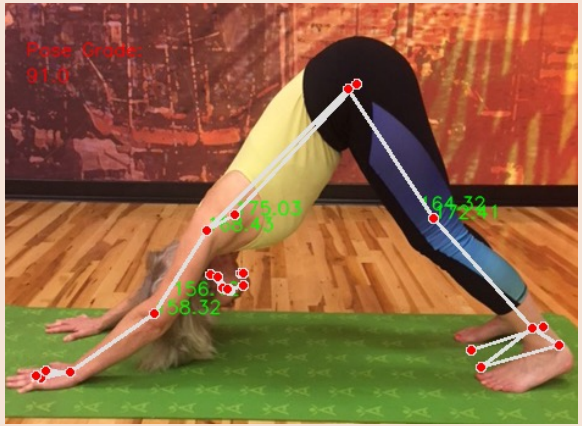
Experiments Grade (Down dog)

$$Cosine - Similarity(x, y) = \frac{x * y}{|x| * |y|}$$

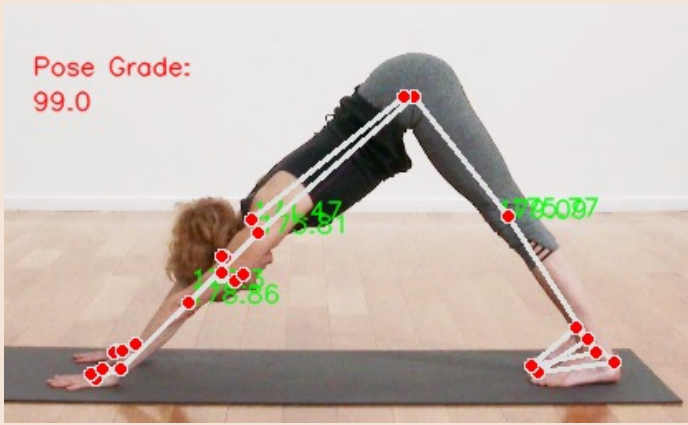




Score: 77.0

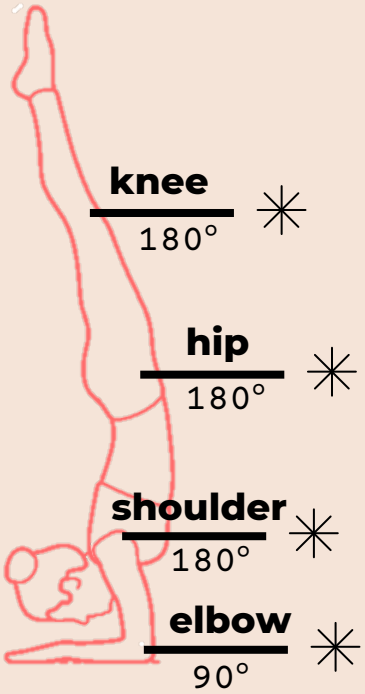


Score: 91.0

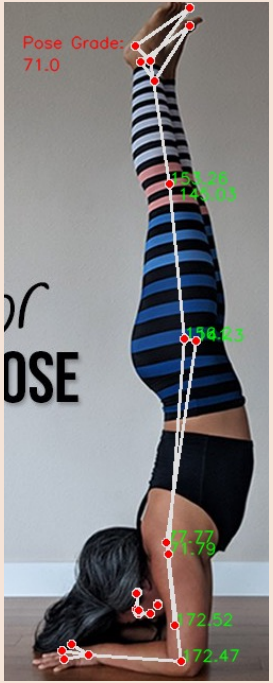


Score: 99.0

Experiments Grade (Feathered Peacock)



Score: 46.0



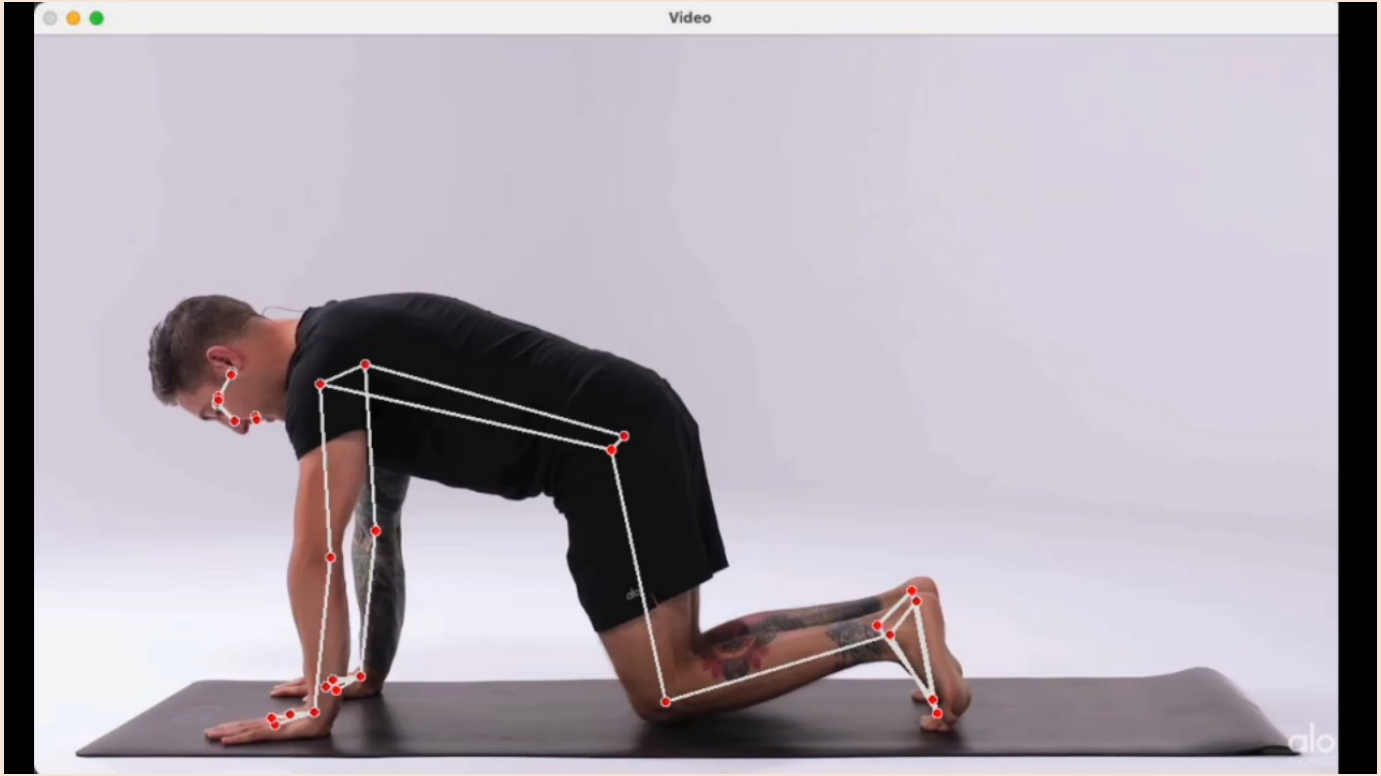
Score: 71.0

Score: 92.0

05

Demo

Demo Down Dog



Demo Feathered Peacock

06

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!

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