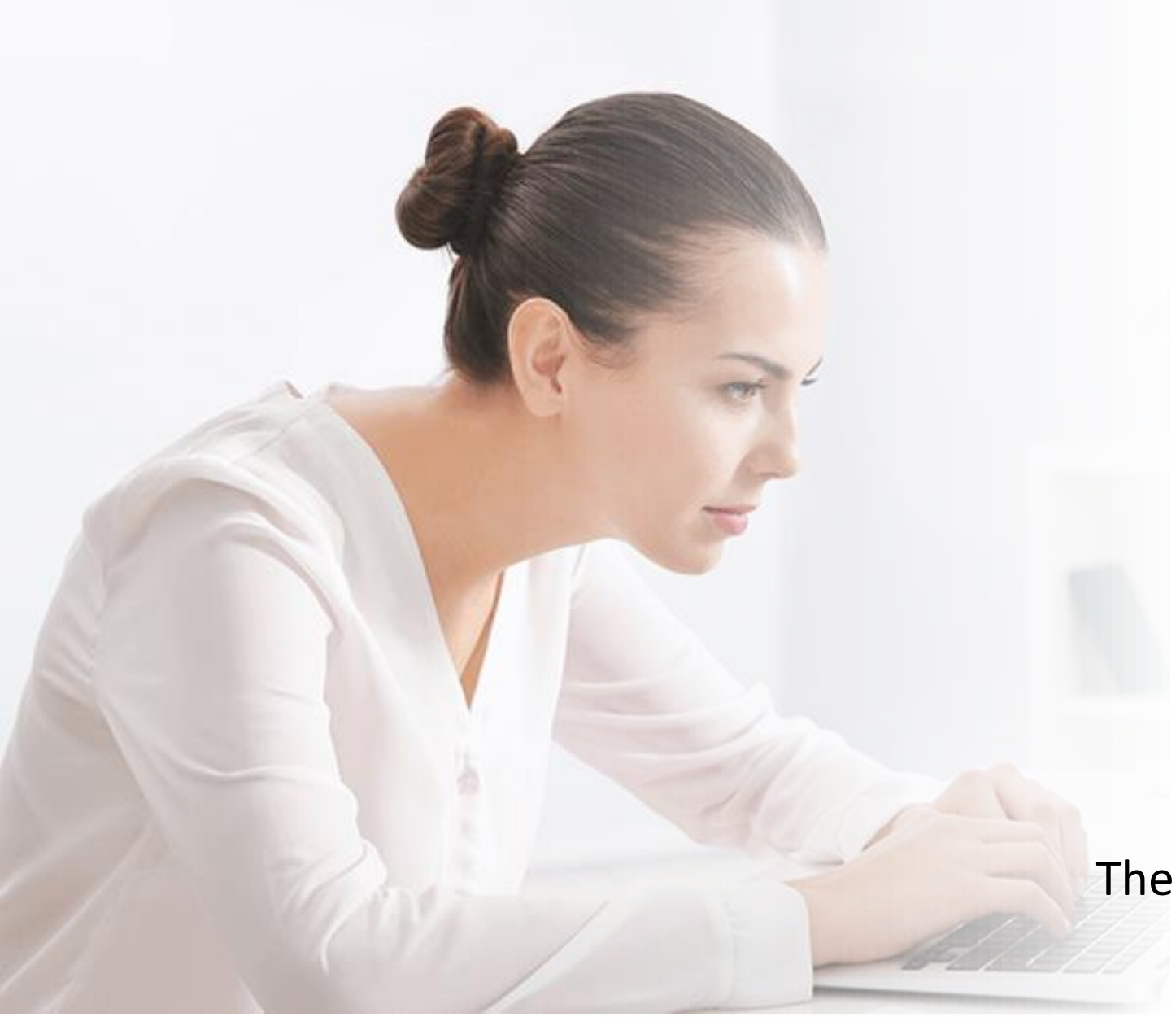
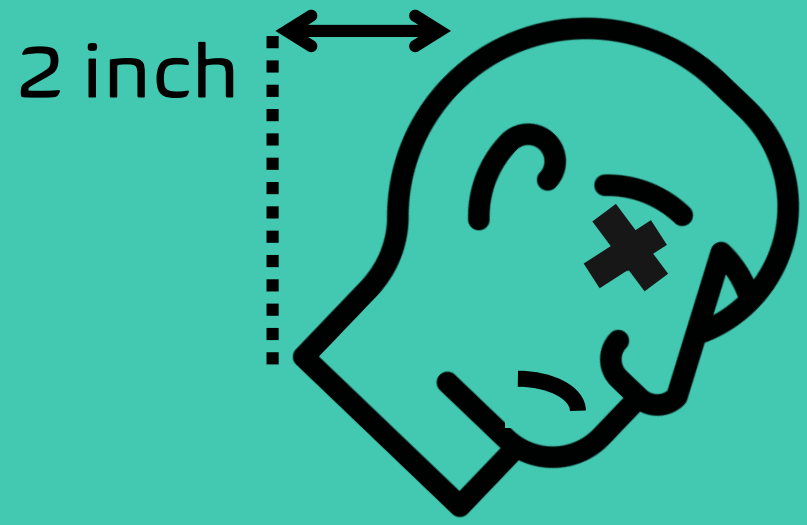


Sit-Up!

The personalized **AI** posture practitioner

10 pounds

(4.5 kg)

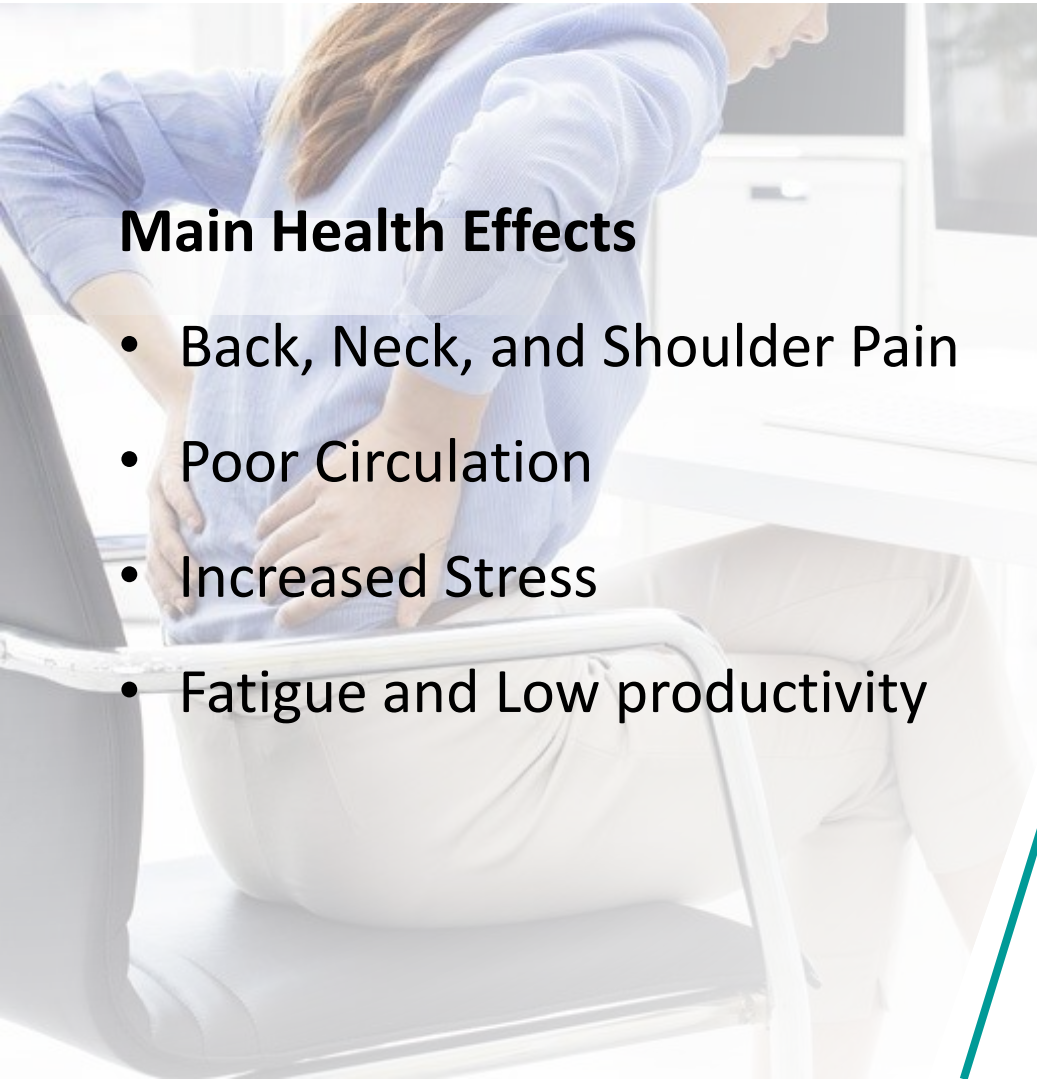

2 inch

≈


+9 L

PROBLEM INTRODUCTION

How bad posture can affect you ?



Main Health Effects

- Back, Neck, and Shoulder Pain
- Poor Circulation
- Increased Stress
- Fatigue and Low productivity

80% of adults are suffering back pain caused by bad posture

86bil. of low-back pain cost in US each year

$30,000 is spent on posture-related injuries per patient

33% of work injuries are posture-related

CURRENT SOLUTIONS FOR POSTURE CORRECTION

The current products are still not effective to solve posture problems

Back brace

Muscle contraction detector

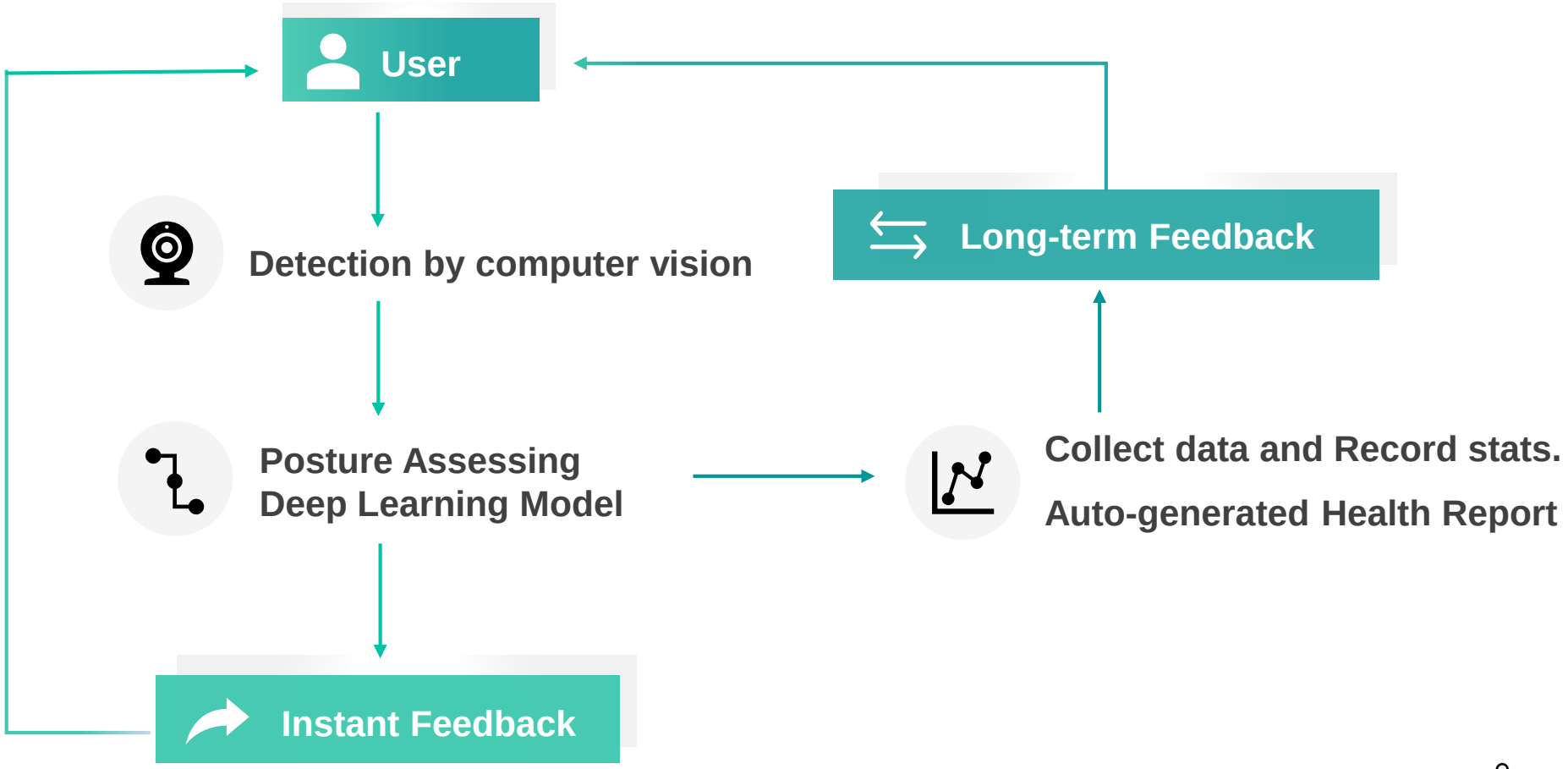
Ergonomics furniture

Sit-Up!

The personalized AI posture practitioner

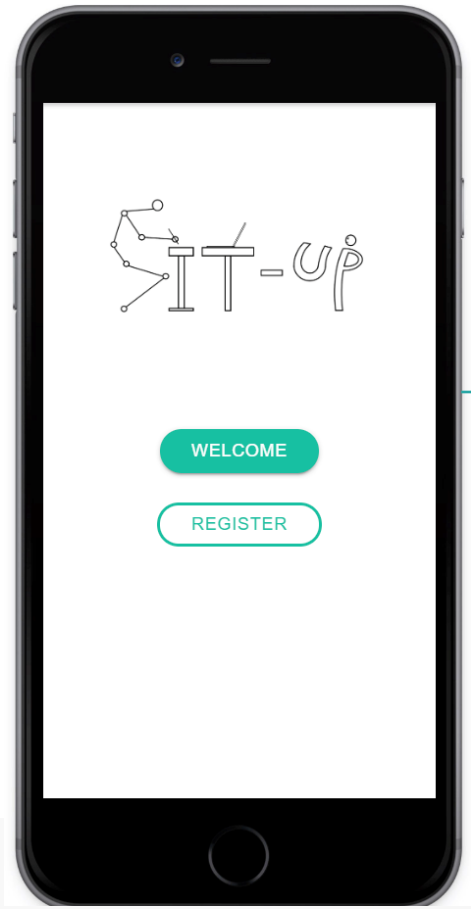
THE PROCESS OF USE

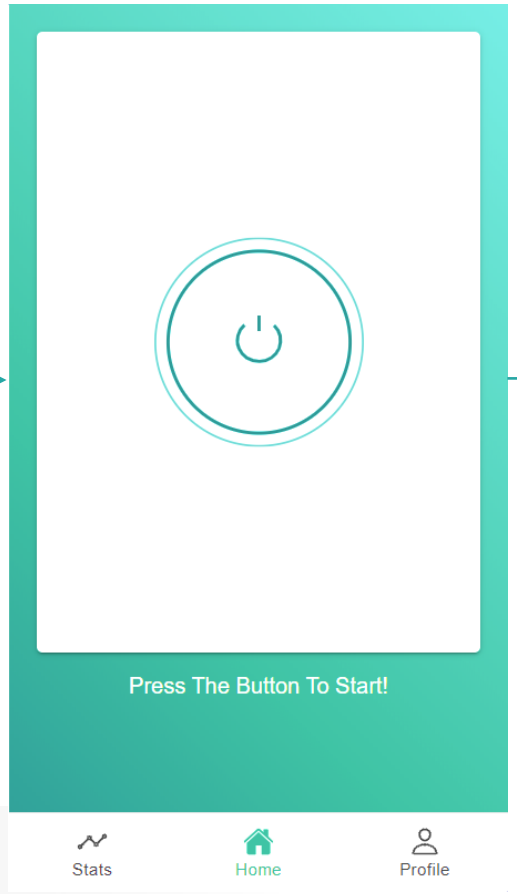
Sit-Up! – How it works?

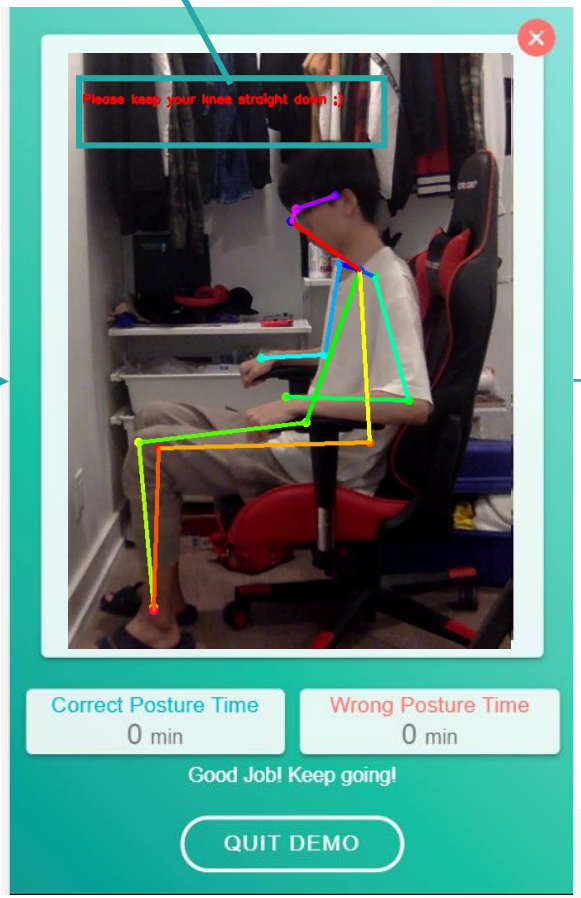


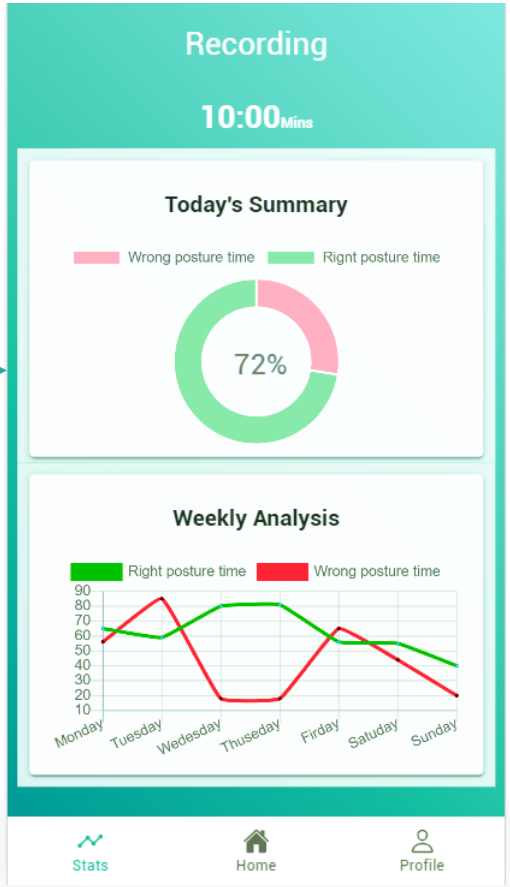
THE PROCESS OF USE

Sit-Up! – Frontend Interface





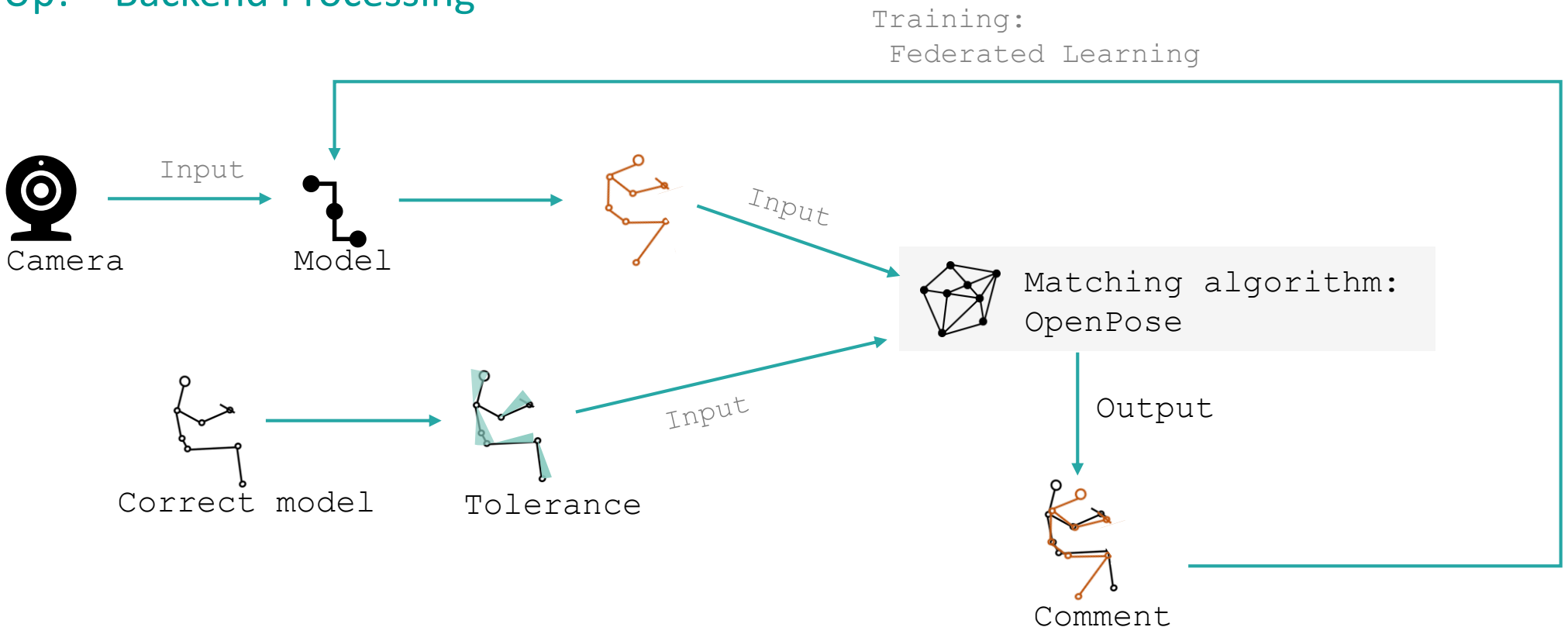




Cross-platform Frontend Tool: Ionic

THE PROCESS OF USE

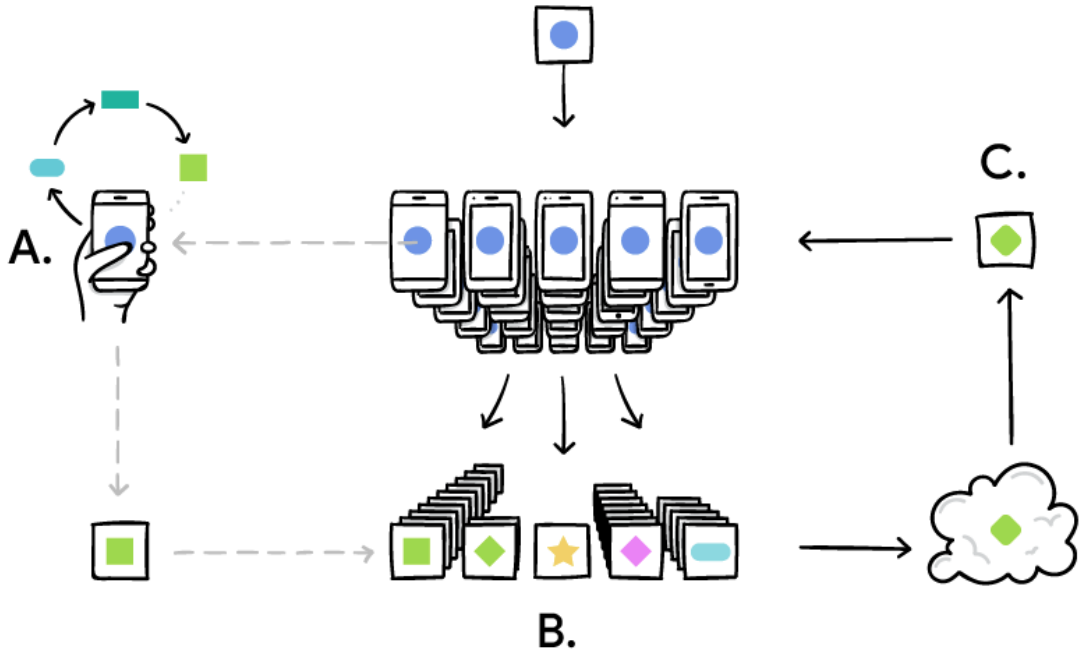
Sit-Up! – Backend Processing



Dataset: COCO dataset
Algorithm: OpenPose
Accuracy: 80+% for each individual joint

COUNTERING SURVEILLANCE CRISIS

Federated Learning ensures Security and Privacy



Algorithm:

Federated Stochastic Gradient Descent (FedSGD)

PRODUCT ADVANTAGE

Sit-Up! - The AI-powered device can achieve:

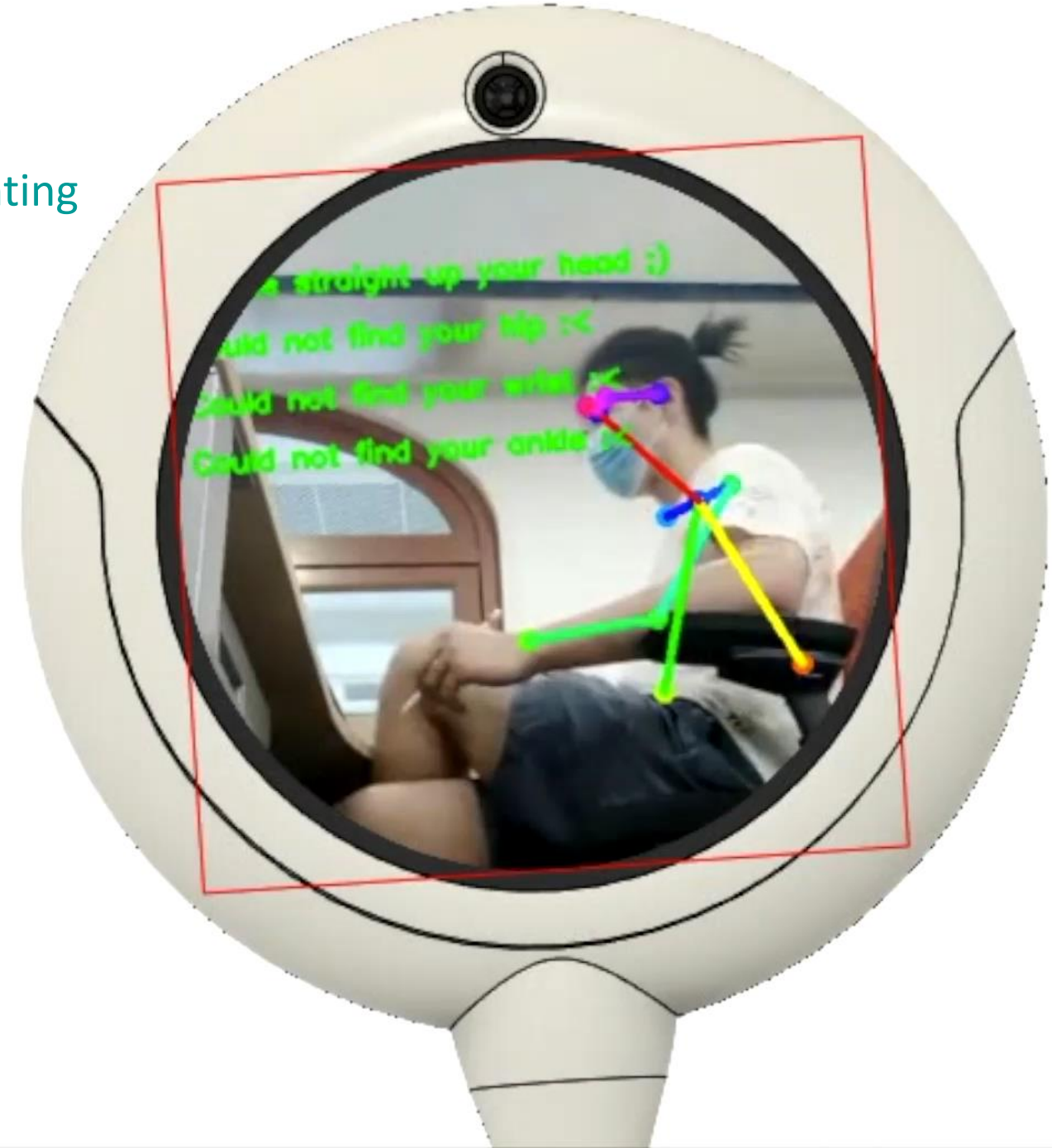
Simple & Flexible

Robust & Accurate

Cost-effective

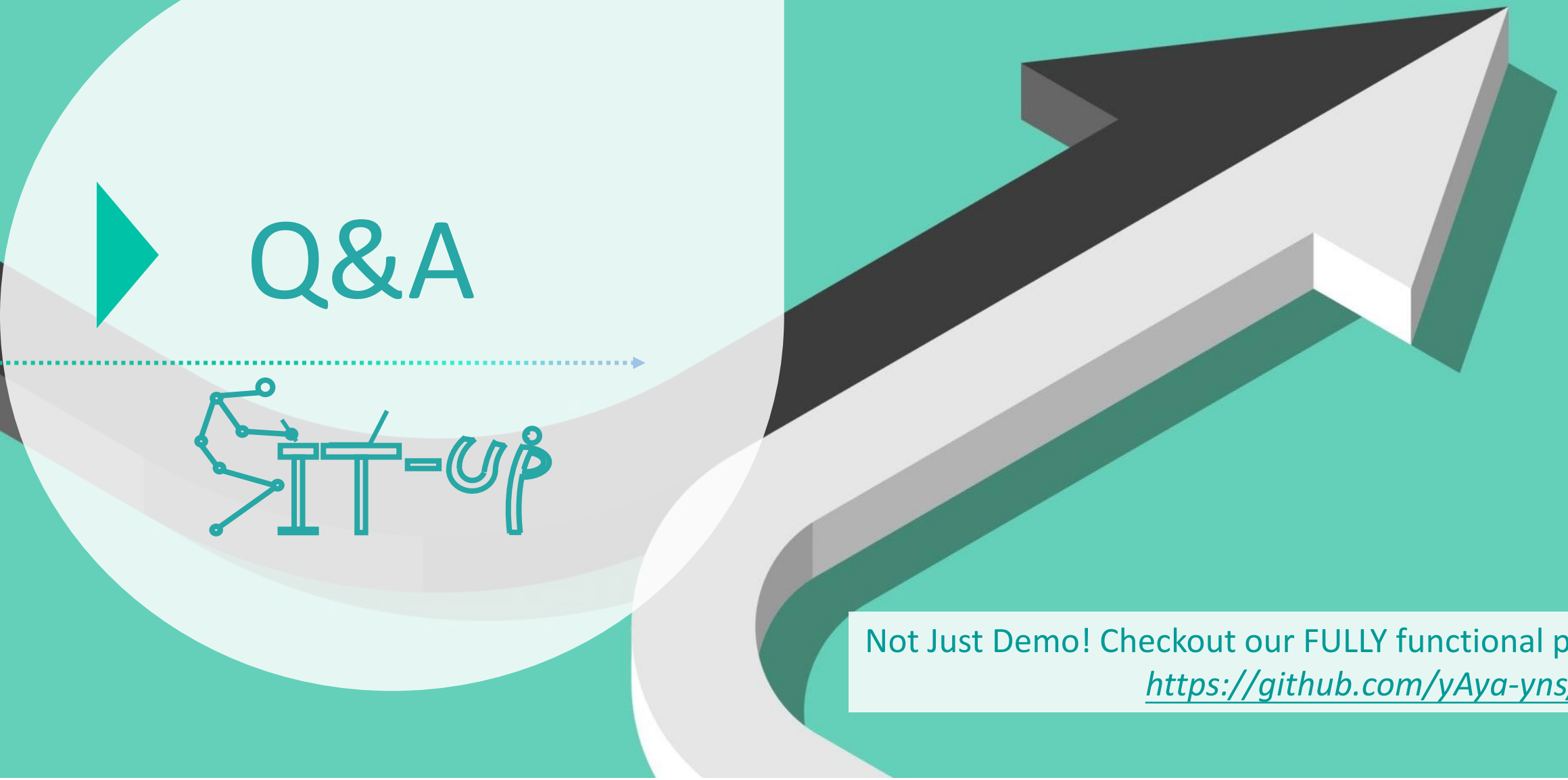
DEMO

Sit-Up! – Presenting



Q&A

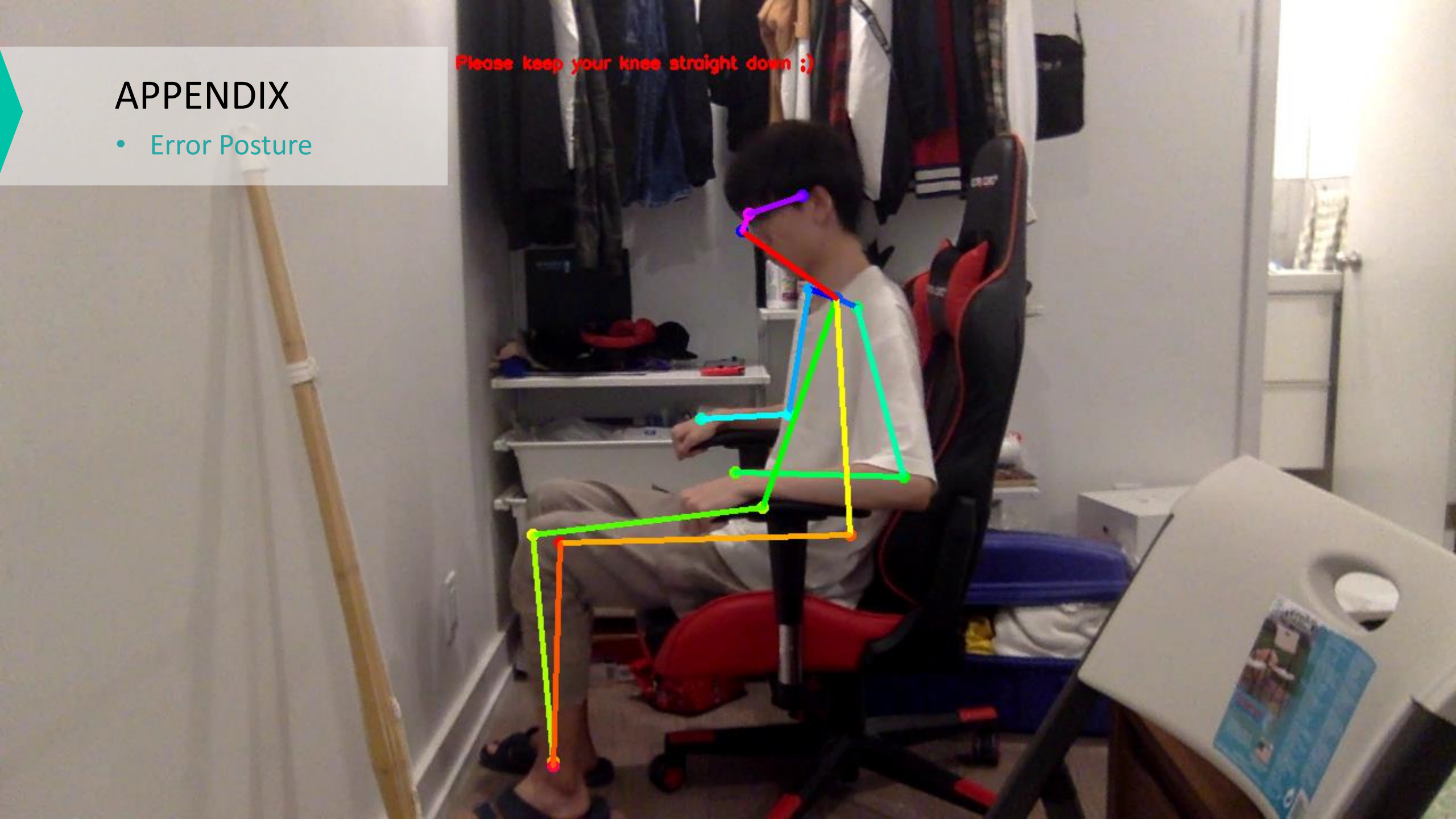
Sit-up



Not Just Demo! Checkout our FULLY functional product at:
https://github.com/yAya-yns/Sit-up.git

APPENDIX

- Error Posture

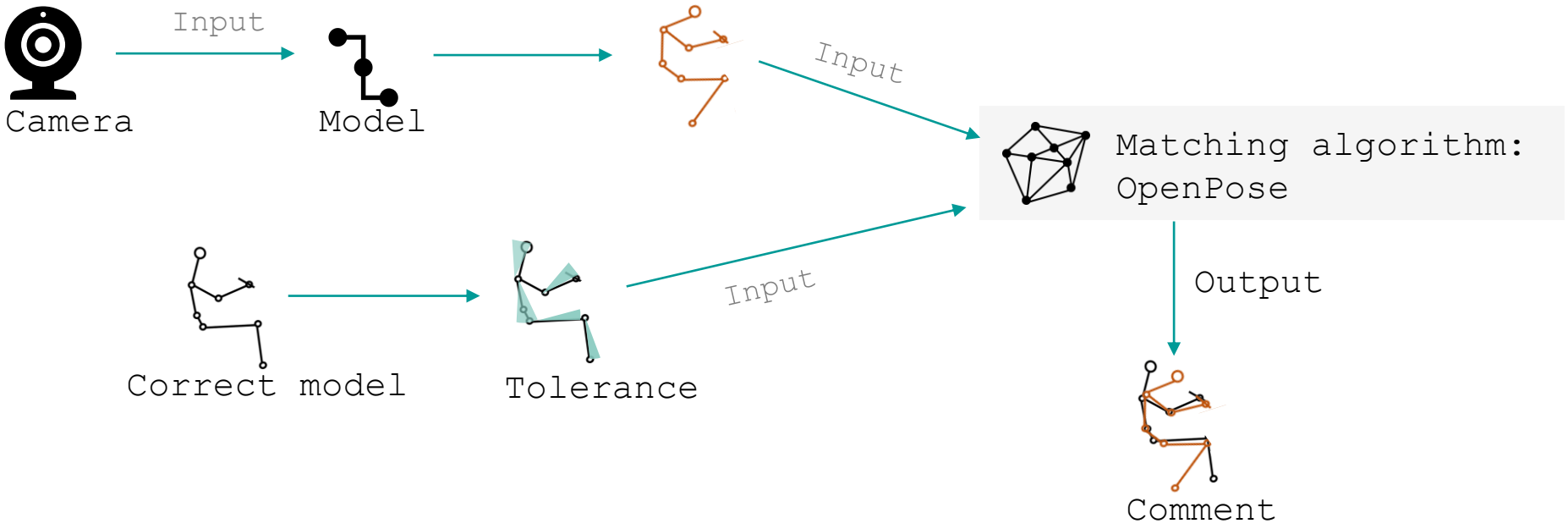


APPENDIX

- Correct Posture

APPENDIX

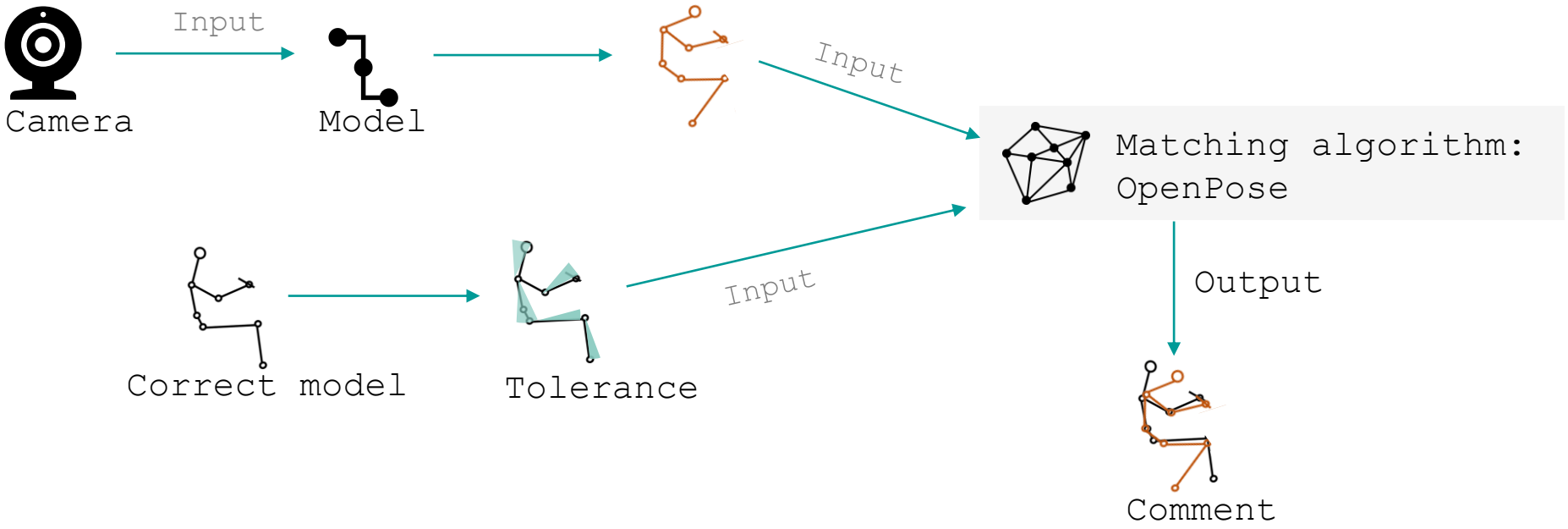
- Backend Process



Dataset: COCOdataset
Algorithm: OpenPose
Accuracy: 80+%

APPENDIX

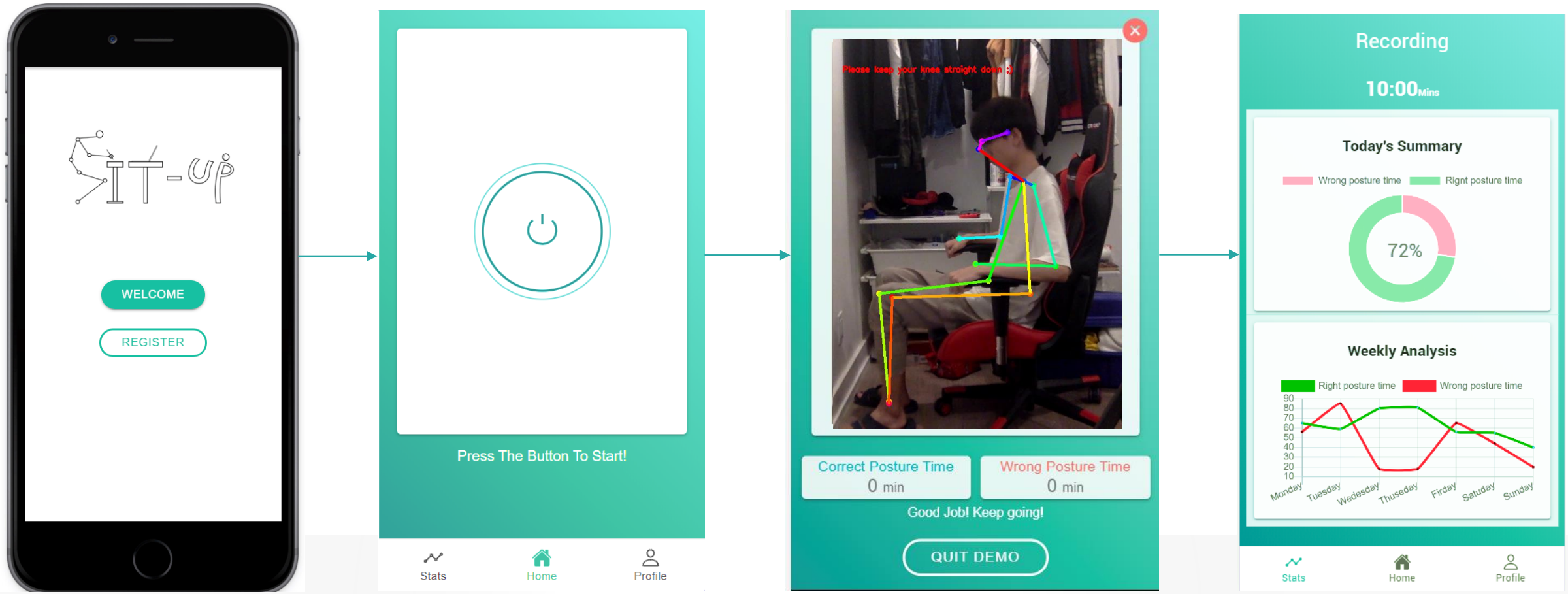
- Backend Process



Dataset: COCOdataset
Algorithm: OpenPose
Accuracy: 80+%

APPENDIX

- Demo app interface



APPENDIX

- Training Data

What is COCO?

COCO is a large-scale object detection, segmentation, and captioning dataset. COCO has several features:

- **Object segmentation**
- **Recognition in context**
- **Superpixel stuff segmentation**
- **330K images (>200K labeled)**
- **1.5 million object instances**
- **80 object categories**
- **91 stuff categories**
- **5 captions per image**
- **250,000 people with keypoints**

REFERENCE

Presentation

- https://www.health24.com/Medical/Backache/Good-posture/Slouching-a-real-back-breaker-20120721
- https://www.mensjournal.com/health-fitness/4-reasons-stop-slouching/
- https://www.thegoodbody.com/back-pain-statistics/
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- https://www.theroststand.com/blogs/the-roost-blog/12381213-the-cost-of-poor-posture
- https://www2.deloitte.com/us/en/insights/industry/technology/technology-media-and-telecom-predictions/2020/ai-chips.html
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- https://ai.googleblog.com/2017/04/federated-learning-collaborative.html
- https://towardsdatascience.com/federated-learning-and-privacy-preserving-ai-fcddbeb426c5

Backend

- https://cmu-perceptual-computing-lab.github.io/foot_keypoint_dataset/
- https://arxiv.org/abs/1812.08008
- https://github.com/CMU-Perceptual-Computing-Lab/openpose