



MUAY TH.AI TRAINER

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A black and white photograph of a man, likely a professional wrestler, standing with his hands on his hips. He is wearing a wrestling singlet and a championship belt. The background is a blurred outdoor setting. A teal horizontal band is overlaid across the middle of the image, containing the text '1' and 'INTRODUCTION'.

1

INTRODUCTION

WHAT IS MUAY THAI?



มวยไทย
Thai Boxing

Art of

8

Limbs

WHAT IS MUAY THAI?



FISTS



ELBOWS

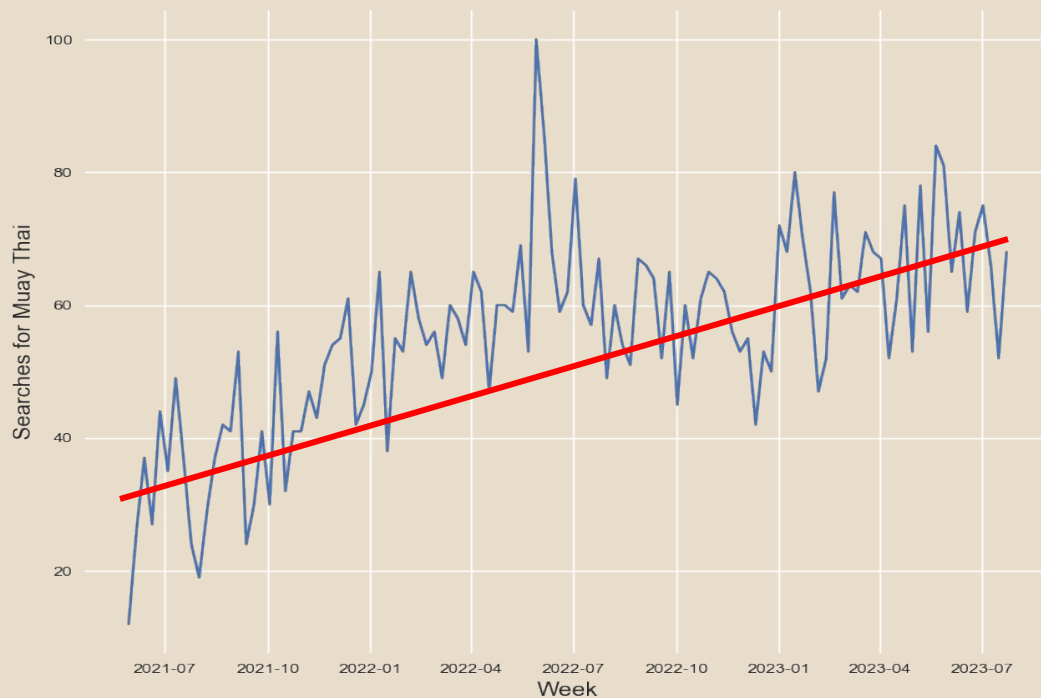


KNEES



SHINS

INTEREST IN MUAY THAI (SINGAPORE)

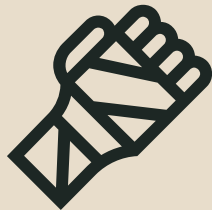


**STEADY INCREASE
FROM 2021-2023**

DIGITAL WELLNESS MARKET

\$280M

In 2023



\$396M

In 2027





4



Posted by



Not sure if my form is much better here, tried to rotate hips more and lead my kicks with my knee, think some old habits are still sneaking through but let me know how this looks?

[check my form](#)



90



Posted by



How can I improve my roundhouse?

[check my form](#)



22



Posted by



Feedback on my technique

[check my form](#)



21



Posted by



Thoughts on jab

[check my form](#)

PROBLEM STATEMENT

“

Proper form is necessary to prevent injury and maximise effectiveness. However, group classes lack personalised attention, and costly personal training isn't feasible for many.

An AI Muay Thai trainer can offer affordable real-time form guidance.

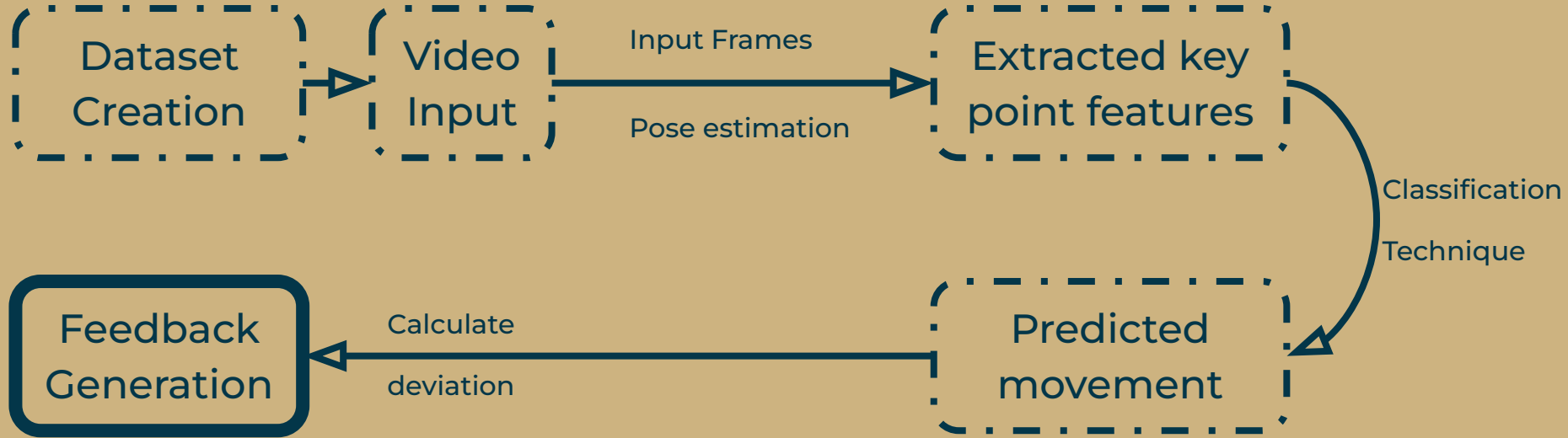
”



A grayscale photograph of a man in a military-style tactical vest, holding a championship belt. The image is overlaid with a teal horizontal band containing the text '2 METHODOLOGY'.

2 METHODOLOGY

METHODOLOGY



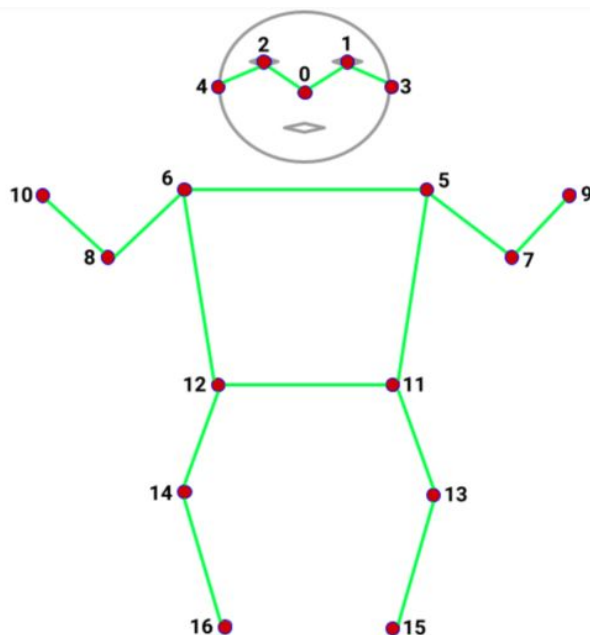
TOOLS







movenet/singlepose/thunder



- 0: nose
- 1: left_eye
- 2: right_eye
- 3: left_ear
- 4: right_ear
- 5: left_shoulder
- 6: right_shoulder
- 7: left_elbow
- 8: right_elbow
- 9: left_wrist
- 10: right_wrist
- 11: left_hip
- 12: right_hip
- 13: left_knee
- 14: right_knee
- 15: left_ankle
- 16: right_ankle

TWO CLASSES



FISTS



ELBOWS



KNEES



SHINS

TWO CLASSES



JAB

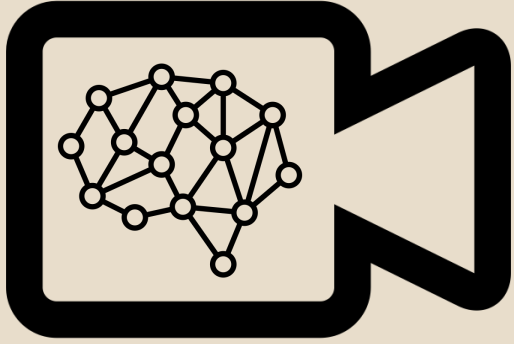


KICK

A black and white photograph of a man, likely a professional wrestler, standing with his hands on his hips. He is wearing a wrestling singlet and a championship belt. The background is a blurred outdoor setting. A teal-colored horizontal band is overlaid across the middle of the image, containing the text '3' and 'EDA + DEMO'.

3

EDA + DEMO



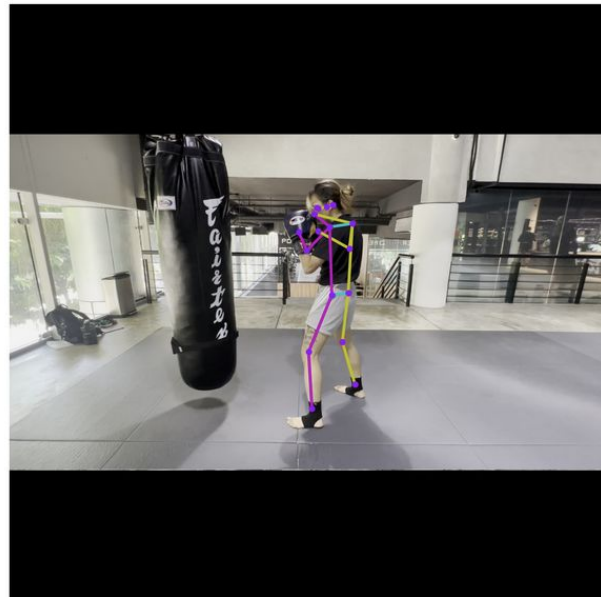
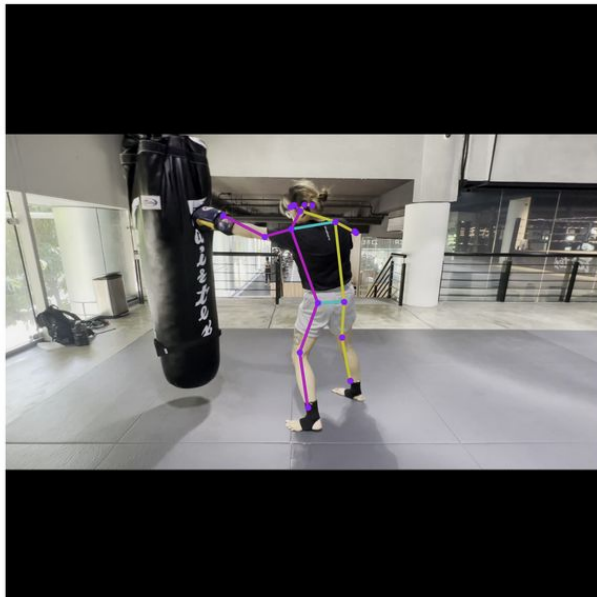
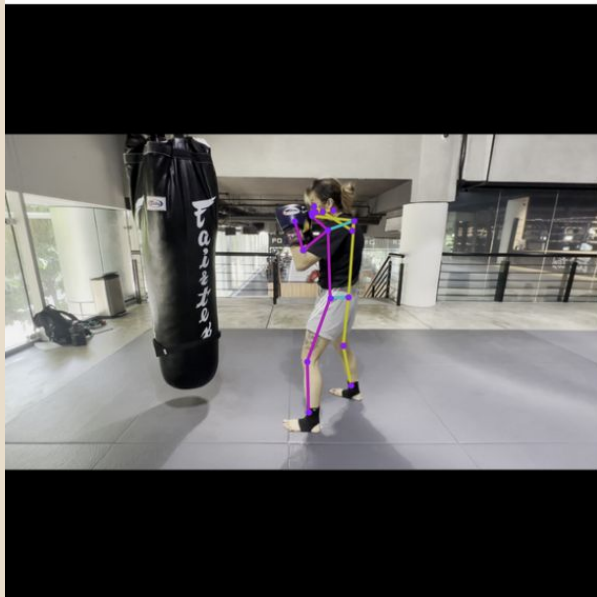
A man in a martial arts gi with a championship belt. The image is a grayscale photograph of a man in a martial arts gi, standing with his hands on his hips. He is wearing a black gi with a white belt. The background is a blurred outdoor setting. A teal-colored horizontal band is overlaid across the middle of the image, containing the text "4 CHALLENGES" in white. The number "4" is large and bold, and the word "CHALLENGES" is in a smaller, bold, sans-serif font.

4 CHALLENGES

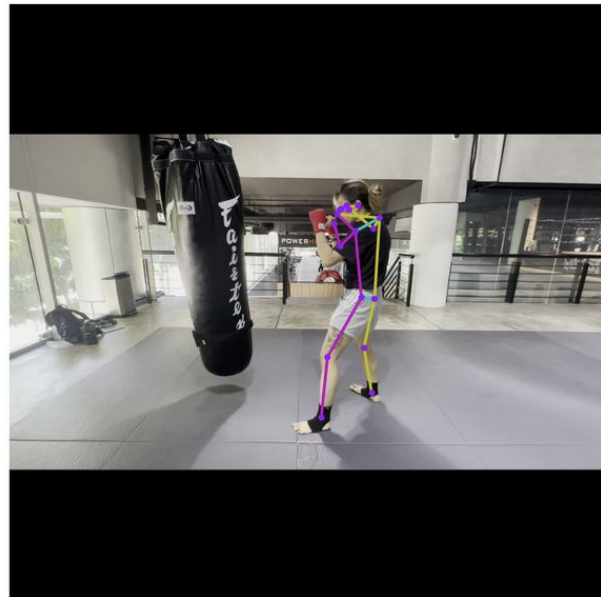
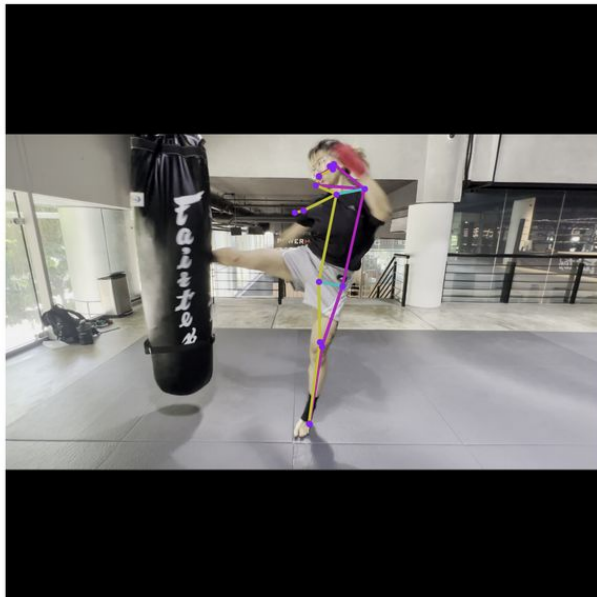
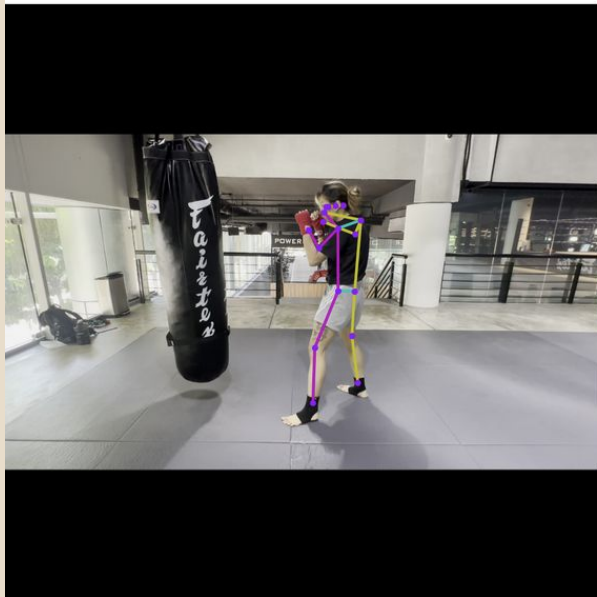
CHALLENGE #1

**THE MOVEMENTS ARE TOO FAST FOR
KEYPOINT PREDICTION**

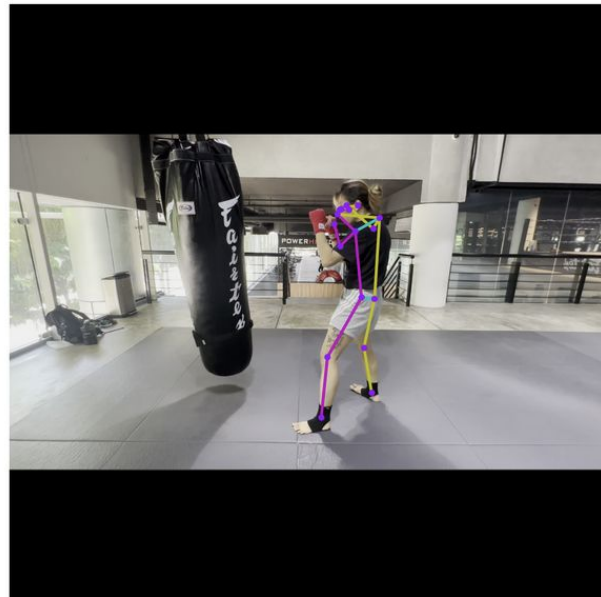
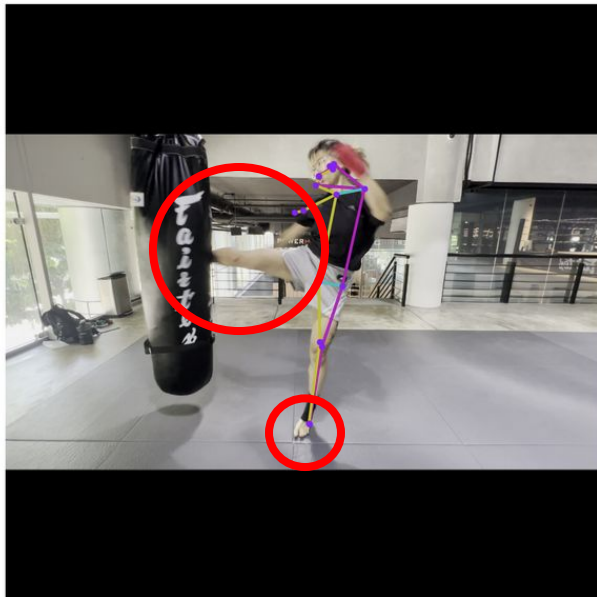
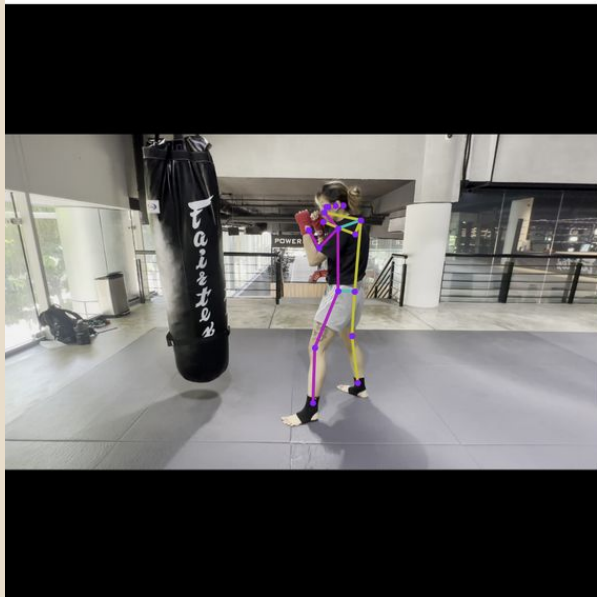
JAB



KICK



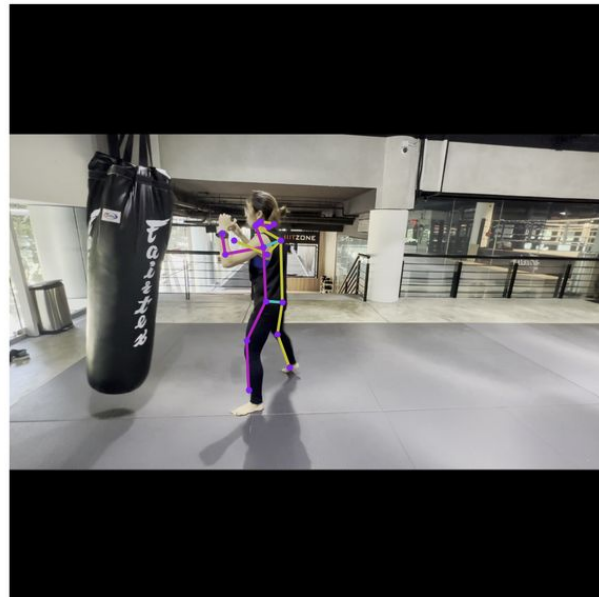
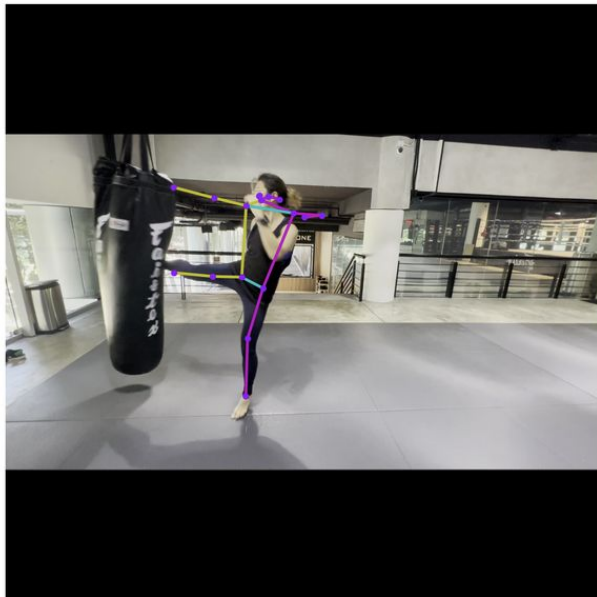
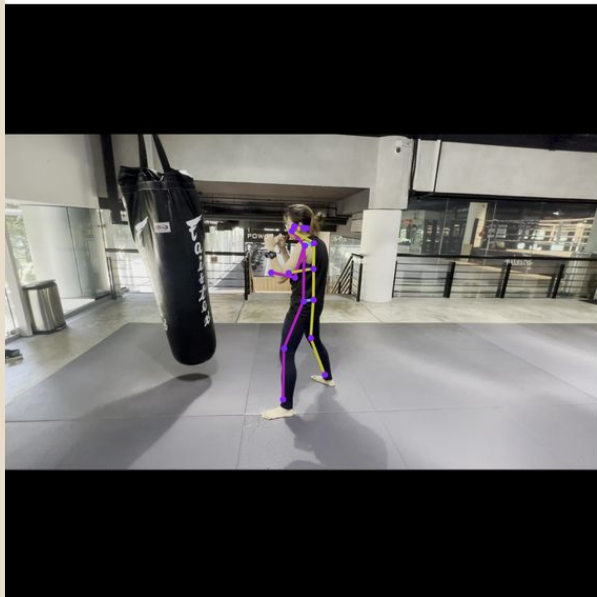
KICK



SOLUTION #1

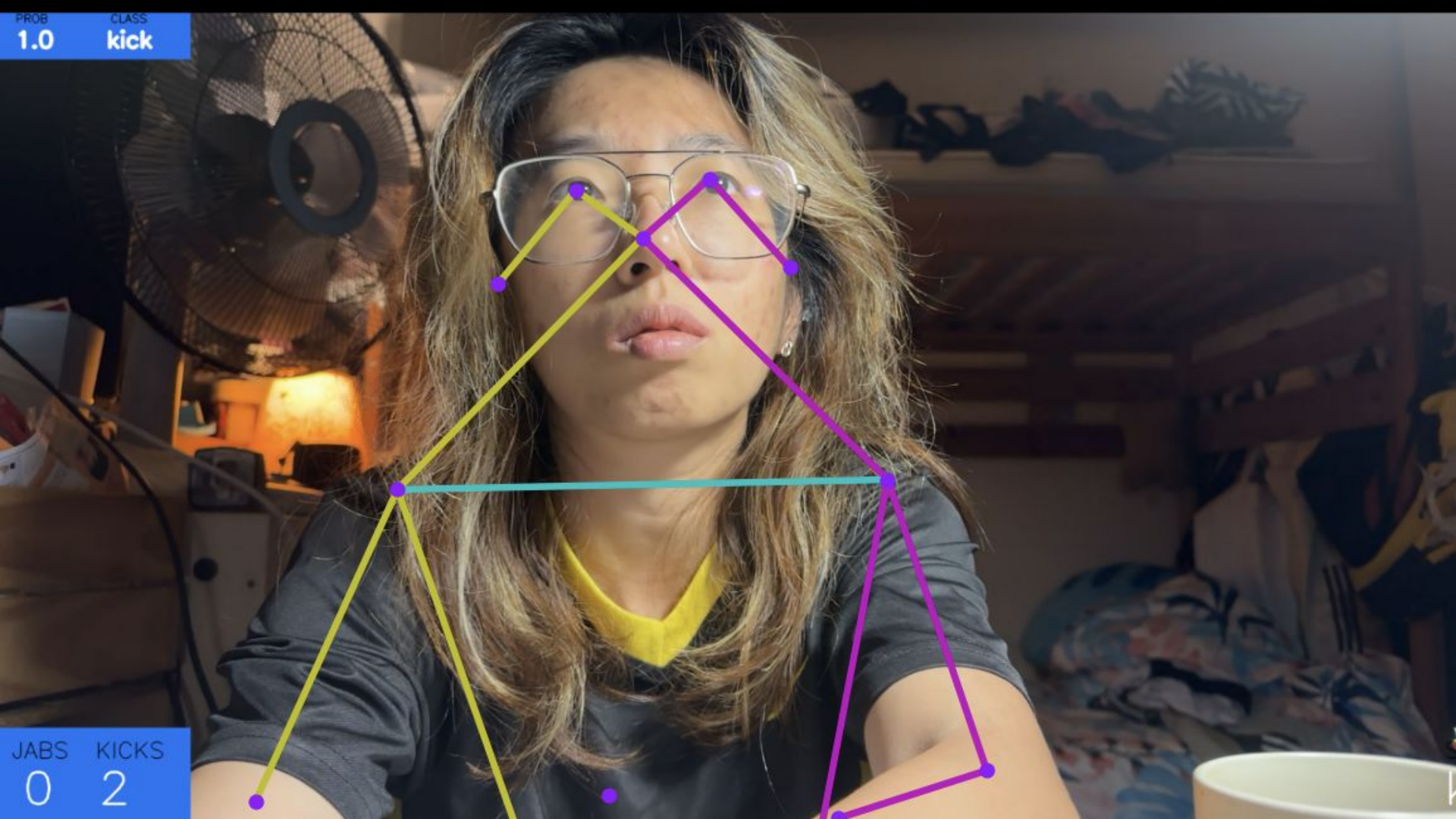
**INCREASING CONTRAST BETWEEN THE
HUMAN FIGURE AND BACKGROUND**

DATA CLEANING - KICK



CHALLENGE #2

**THE MODEL BEHAVES ERRATICALLY
WHEN CONFRONTED WITH SITUATIONS IT
WAS NOT TRAINED FOR**



SOLUTION #2

**WRITE CODE TO DETECT WHEN THE
CAMERA PLACEMENT IS INCORRECT**

Please film yourself from the side
and ensure your ankles are visible

JABS KICKS

0

0

CHALLENGE #3

**THE MODEL HAD DIFFICULTY COUNTING
THE NUMBER OF JABS AND KICKS**

SOLUTION #3

**WROTE FUNCTIONS TO DISTINGUISH A
NEW THIRD CLASS—‘GUARD’**

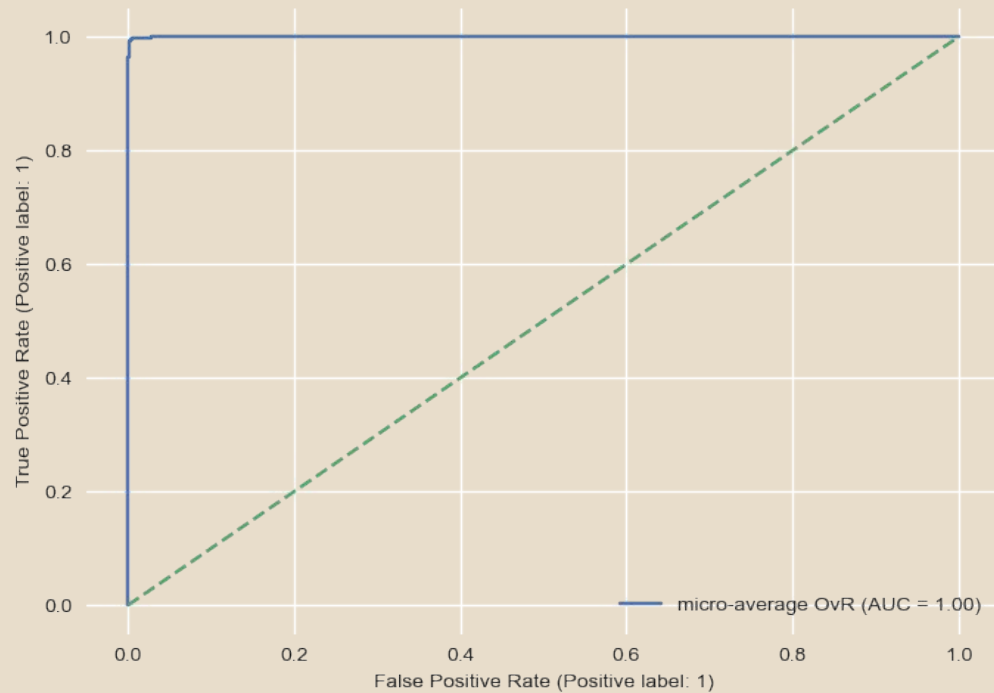
A black and white photograph of a man, likely a professional wrestler, standing with his hands on his hips. He is wearing a wrestling singlet and a championship belt. The background is a blurred outdoor setting. A teal-colored horizontal band is overlaid across the middle of the image, containing the text "5 MODELS".

5 MODELS

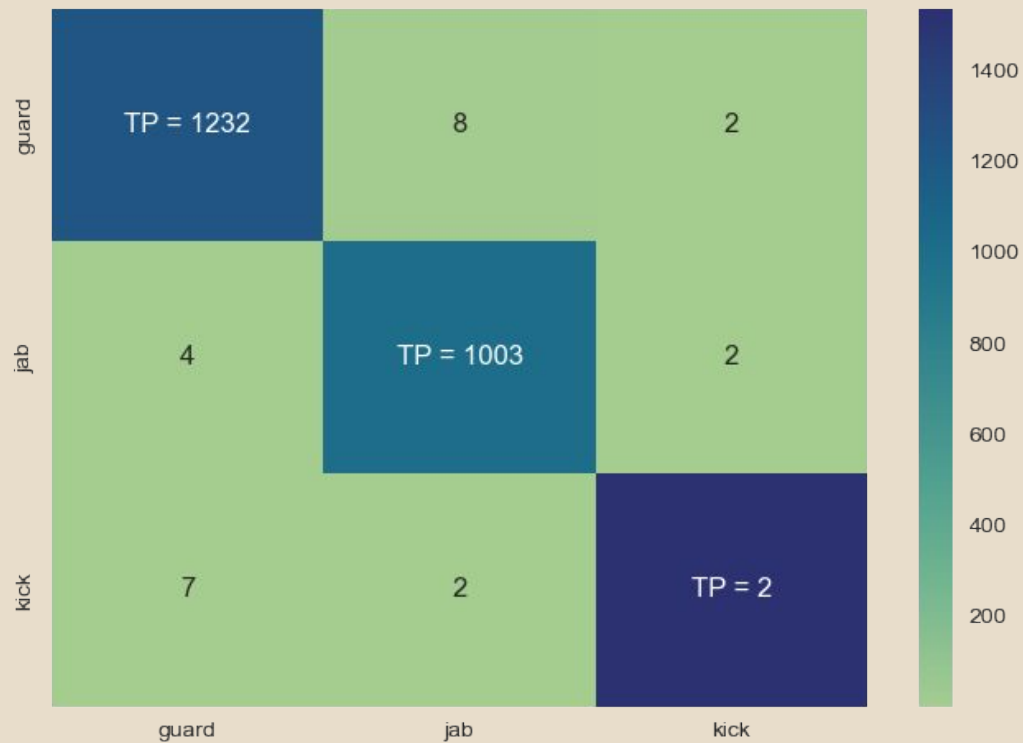
MODEL PERFORMANCE

	ROC-AUC (TRAIN)	ROC-AUC (TEST)	TIME TAKEN (SECONDS)
LOGISTIC REGRESSION (BASELINE)	0.99	0.99	67.8
RANDOM FOREST	1.00	1.00 (↑ 1%)	85.1 (↓ 25.5%)
ADA BOOST	0.99	0.99	40.6 (↑ 40.1%)
REGULARISED GREEDY FOREST	1.00	1.00 (↑ 1%)	21.5 (↑ 68.3%)

1.0
ROC-AUC



0.99
f1-Score



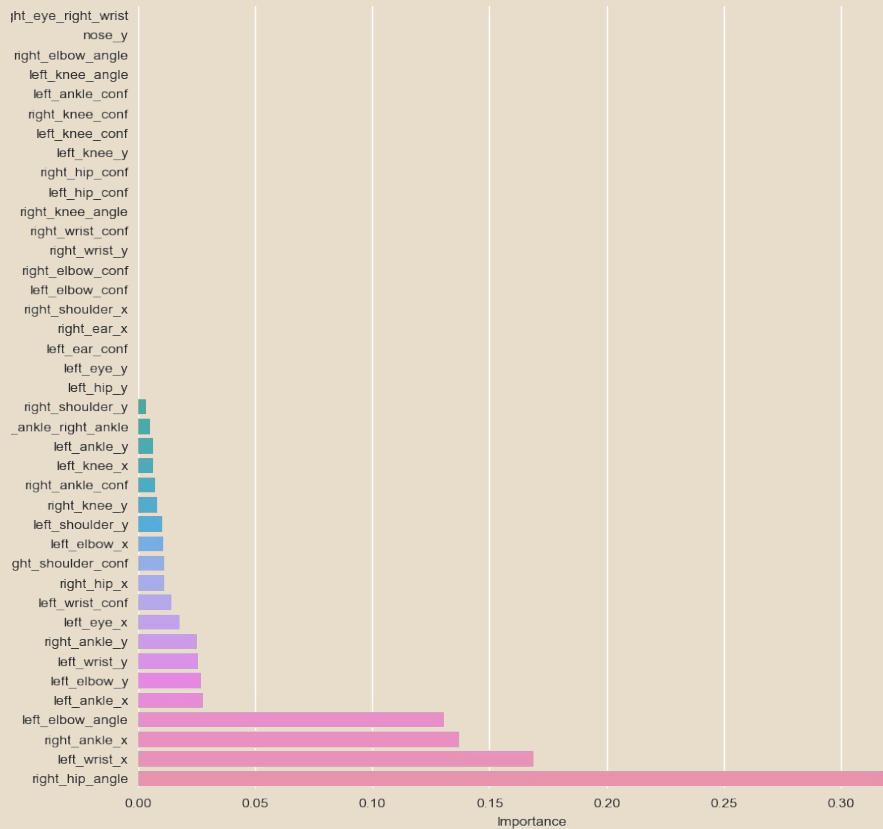
1. RIGHT HIP ANGLE

2. LEFT WRIST X

3. RIGHT ANKLE X

4. LEFT ELBOW ANGLE

5. LEFT ANKLE X

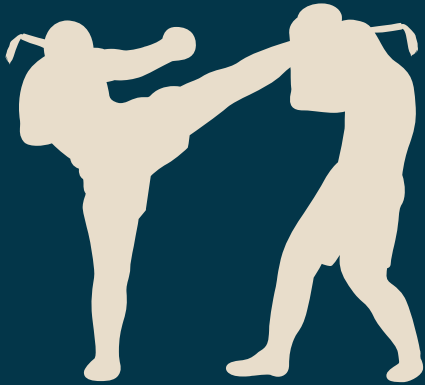


A black and white photograph of a man, likely a professional wrestler, standing with his hands on his hips. He is wearing a wrestling singlet and a championship belt. The background is a blurred outdoor setting. A teal horizontal band is overlaid across the middle of the image, containing the text '6 CONCLUSION'.

6

CONCLUSION

INSIGHTS



1. The model was able to achieve the end goal of giving recommendations for the two classes.
2. However, in order to truly be useful for live training, the speed of the model needs to be improved.
3. Overall, this is a successful proof of concept.

FUTURE WORK

1. Improve the speed of the model, possibly by hosting on a cloud server and/or cleaning up the code.
2. Expand the training set to make it more reliable in more situations (lighting, angles, etc.).
3. Expand to other Muay Thai moves.



A male Muay Thai fighter is shown from the chest up, standing in a boxing ring. He is wearing a blue and red headband, white hand wraps, and blue and red armbands. His hands are clasped in front of his chest. The background is a blurred view of the boxing ring and its ropes. A semi-transparent grey horizontal band is overlaid across the middle of the image, and the text 'Q&A' is centered within it in a bold, dark blue font.

Q&A