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In [2]: !wget -O pose_landmarker.task -q https://storage.googleapis.com/mediapipe
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In [10]: import numpy as np
from mediapipe import solutions
from mediapipe.framework.formats import landmark_pb2

def calculate_angle(a, b, c):
    a = np.array([a.x, a.y, a.z])
    b = np.array([b.x, b.y, b.z])
    c = np.array([c.x, c.y, c.z])

    ba = a - b
    bc = c - b

    cosine_angle = np.dot(ba, bc) / (np.linalg.norm(ba) * np.linalg.norm(bc))
    angle = np.arccos(cosine_angle)

    return np.degrees(angle)

def draw_landmarks_on_image(rgb_image, detection_result):
    pose_landmarks_list = detection_result.pose_landmarks
    pose_world_landmarks_list = detection_result.pose_world_landmarks
    annotated_image = np.copy(rgb_image)

    # Loop through the detected poses to visualize.
    for idx in range(len(pose_landmarks_list)):
        pose_landmarks = pose_landmarks_list[idx]
        pose_world_landmarks = pose_world_landmarks_list[idx]

        # Draw the pose landmarks.
        pose_landmarks_proto = landmark_pb2.NormalizedLandmarkList()
        pose_landmarks_proto.landmark.extend([
            landmark_pb2.NormalizedLandmark(x=landmark.x, y=landmark.y, z=landmark.z)
            for landmark in pose_landmarks
        ])

        # # Print the x, y, z coordinates of the WorldLandmarks
        # print(f"Pose {idx + 1} WorldLandmarks:")
        # for i, landmark in enumerate(pose_world_landmarks):
        #     print(f"WorldLandmark {i}: x={landmark.x:.4f}m, y={landmark.y:.4f}m, z={landmark.z:.4f}m")

        # Calculate and print the angles
        angle_12_24_26 = calculate_angle(pose_world_landmarks[12], pose_world_landmarks[24], pose_world_landmarks[26])
        angle_24_26_28 = calculate_angle(pose_world_landmarks[24], pose_world_landmarks[26], pose_world_landmarks[28])

        angle_11_23_25 = calculate_angle(pose_world_landmarks[11], pose_world_landmarks[23], pose_world_landmarks[25])
        angle_23_25_27 = calculate_angle(pose_world_landmarks[23], pose_world_landmarks[25], pose_world_landmarks[27])

    print(f"\nAngles:")
    print(f"Angle 12-24-26 (Right Hip): {angle_12_24_26:.2f} degrees"
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print(f"Angle 24-26-28 (Right Knee): {angle_24_26_28:.2f} degrees")
print() # Add a blank line between poses
print(f"Angle 11-23-25 (Left Hip): {angle_11_23_25:.2f} degrees")
print(f"Angle 23-25-27 (Left Knee): {angle_23_25_27:.2f} degrees")
print() # Add a blank line between poses

solutions.drawing_utils.draw_landmarks(
    annotated_image,
    pose_landmarks_proto,
    solutions.pose.POSE_CONNECTIONS,
    solutions.drawing_styles.get_default_pose_landmarks_style())

return annotated_image

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In [ ]: # STEP 1: Import the necessary modules.
import cv2
import matplotlib.pyplot as plt
import mediapipe as mp
from mediapipe.tasks import python
from mediapipe.tasks.python import vision

# STEP 2: Create a PoseLandmarker object.
base_options = python.BaseOptions(model_asset_path='pose_landmarker.task')
options = vision.PoseLandmarkerOptions(
    base_options=base_options,
    output_segmentation_masks=True)
detector = vision.PoseLandmarker.create_from_options(options)

for imgfile in ["side_standing.png", "side_right.png", "side_left.png",
                "angle_standing.png", "angle_right.png", "angle_left.png",
                "frontal_standing.png", "frontal_right.png", "frontal_left.png"]:
    # STEP 3: Load the input image.
    image = mp.Image.create_from_file(imgfile)

    # STEP 4: Detect pose landmarks from the input image.
    detection_result = detector.detect(image)

    # STEP 5: Process the detection result. In this case, visualize it.
    # Convert RGB image to BGR for draw_landmarks_on_image
    bgr_image = cv2.cvtColor(image.numpy_view(), cv2.COLOR_RGB2BGR)
    annotated_image = draw_landmarks_on_image(bgr_image, detection_result)

    # Display the image using matplotlib
    plt.figure(figsize=(10, 10))
    plt.imshow(cv2.cvtColor(annotated_image, cv2.COLOR_BGR2RGB))
    plt.axis('off')
    plt.show()

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```
I0000 00:00:1728835833.329211 40923899 gl_context.cc:357] GL version: 2.1
(2.1 Metal - 89.3), renderer: Apple M1 Max
W0000 00:00:1728835833.473437 41022046 inference_feedback_manager.cc:114]
Feedback manager requires a model with a single signature inference. Disab
ling support for feedback tensors.
W0000 00:00:1728835833.526582 41022046 inference_feedback_manager.cc:114]
Feedback manager requires a model with a single signature inference. Disab
ling support for feedback tensors.
/Users/alan/.virtualenvs/face-ai/lib/python3.10/site-packages/google/proto
buf/symbol_database.py:55: UserWarning: SymbolDatabase.GetPrototype() is d
eprecated. Please use message_factory.GetMessageClass() instead. SymbolDat
abase.GetPrototype() will be removed soon.
  warnings.warn('SymbolDatabase.GetPrototype() is deprecated. Please '
```

Angles:

Angle 12-24-26 (Right Hip): 156.70 degrees

Angle 24-26-28 (Right Knee): 175.55 degrees

Angle 11-23-25 (Left Hip): 168.00 degrees

Angle 23-25-27 (Left Knee): 170.57 degrees



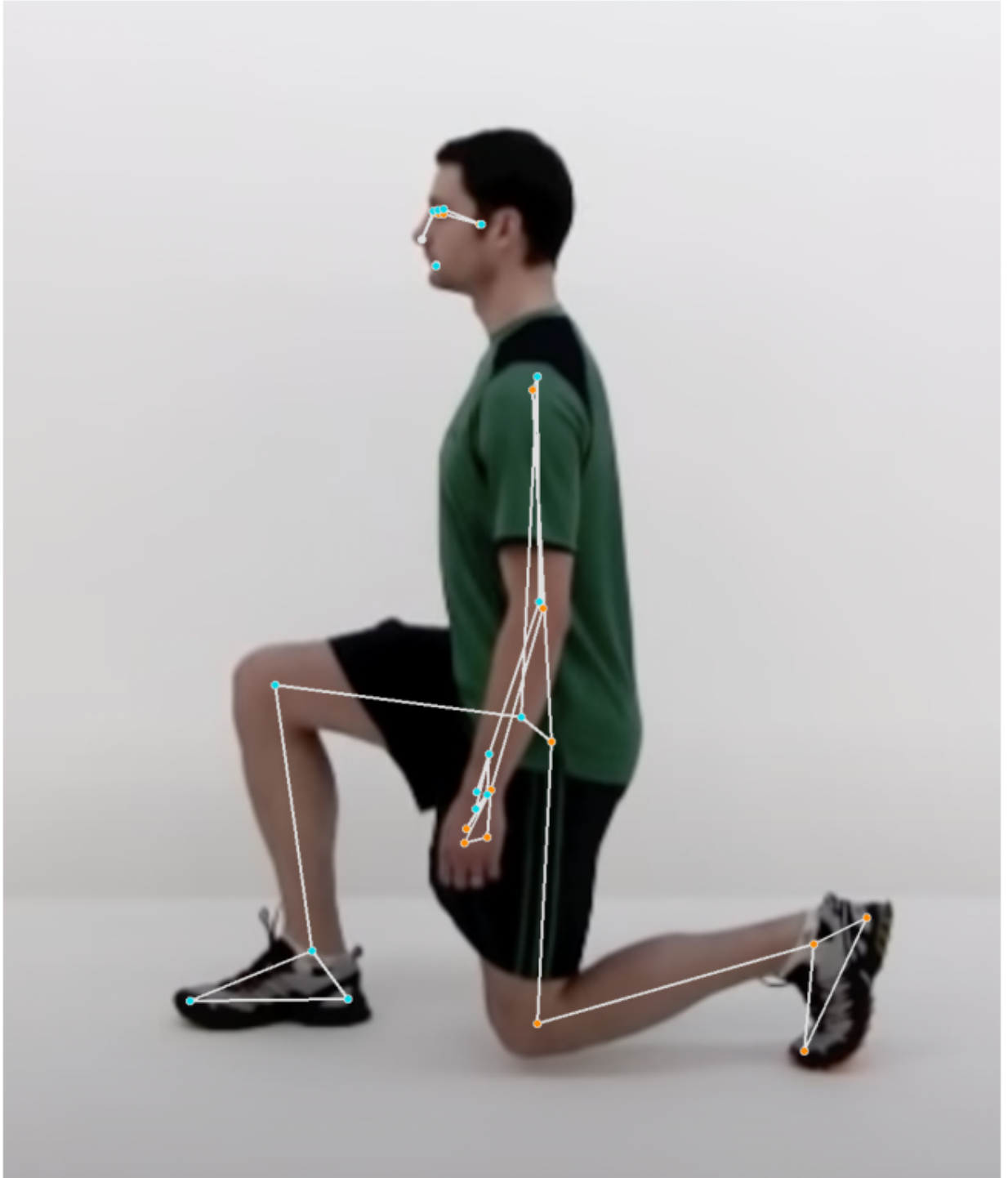
## Angles:

Angle 12-24-26 (Right Hip): 84.95 degrees

Angle 24-26-28 (Right Knee): 83.90 degrees

Angle 11-23-25 (Left Hip): 145.72 degrees

Angle 23-25-27 (Left Knee): 76.79 degrees



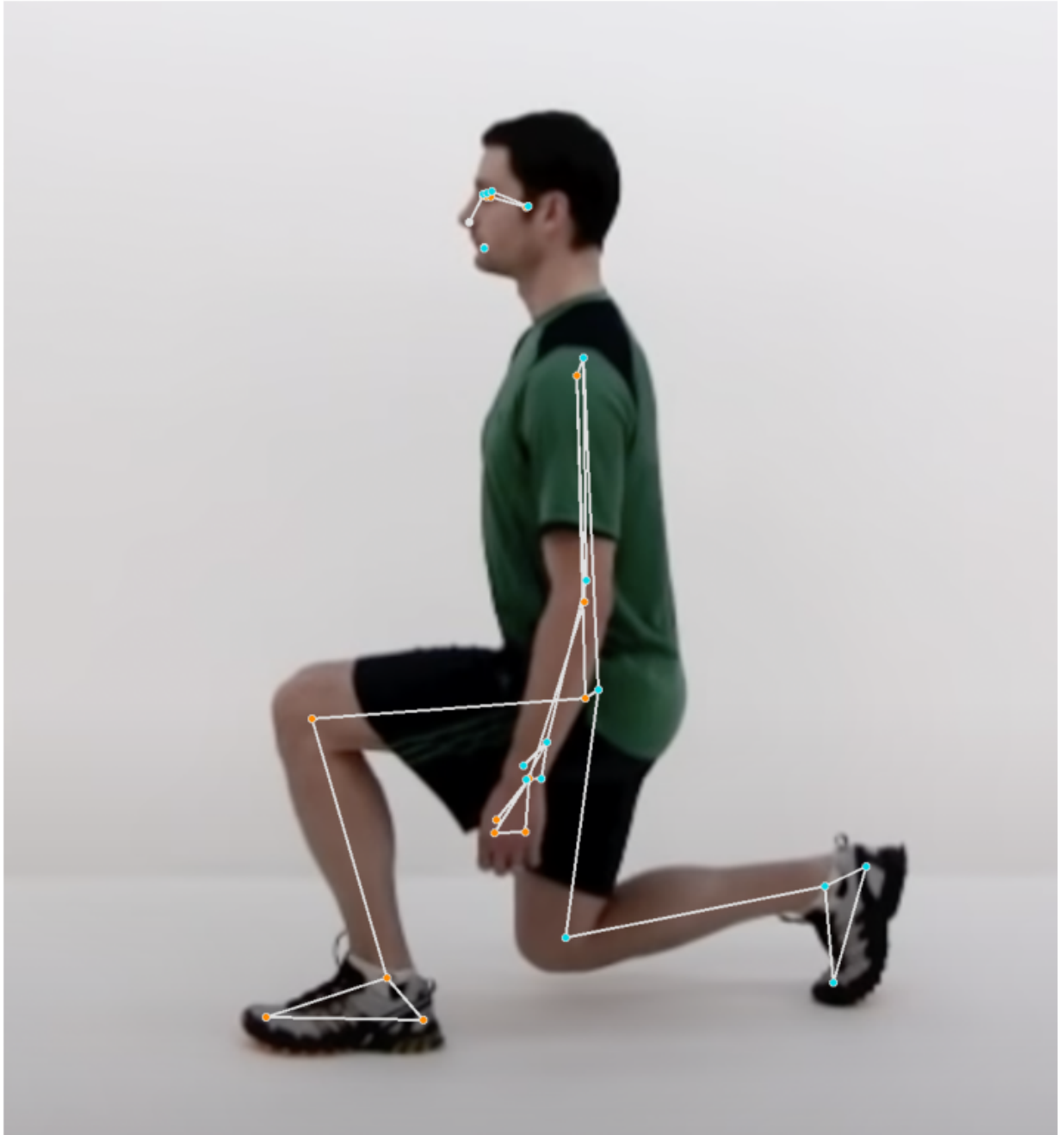
## Angles:

Angle 12-24-26 (Right Hip): 158.02 degrees

Angle 24-26-28 (Right Knee): 85.78 degrees

Angle 11-23-25 (Left Hip): 96.91 degrees

Angle 23-25-27 (Left Knee): 76.84 degrees



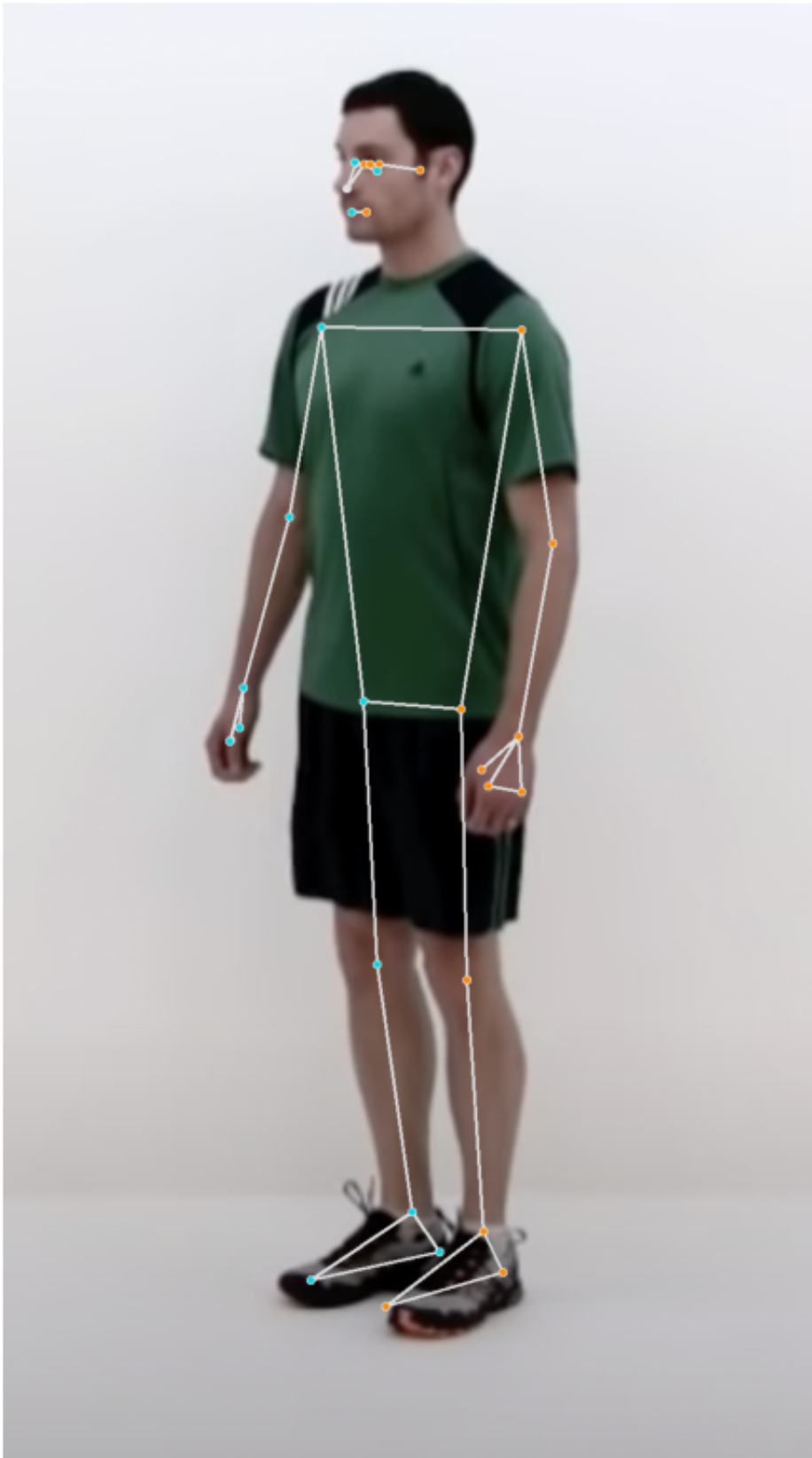
## Angles:

Angle 12-24-26 (Right Hip): 158.07 degrees

Angle 24-26-28 (Right Knee): 170.97 degrees

Angle 11-23-25 (Left Hip): 161.23 degrees

Angle 23-25-27 (Left Knee): 164.72 degrees



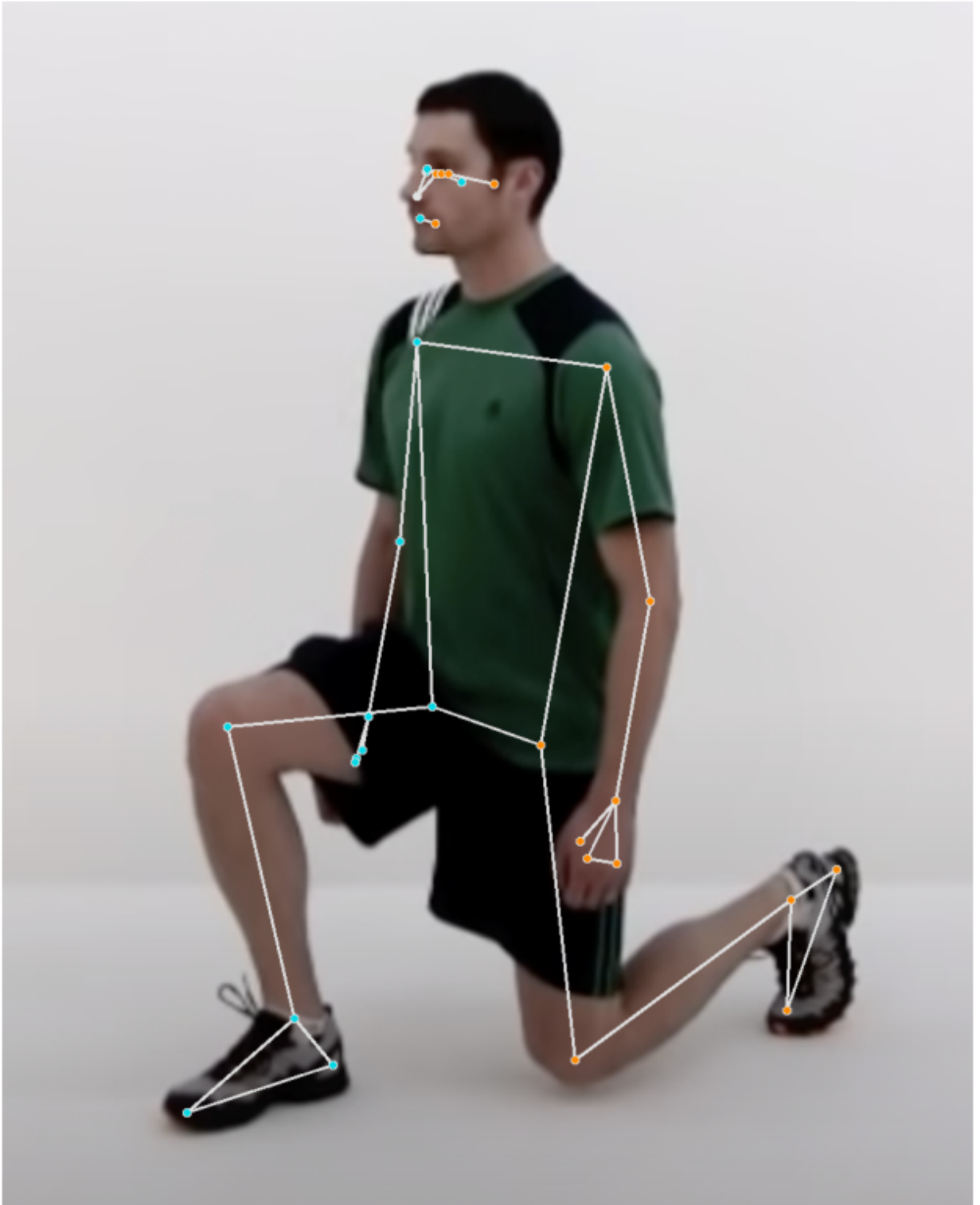
Angles:

Angle 12-24-26 (Right Hip): 91.69 degrees

Angle 24-26-28 (Right Knee): 72.23 degrees

Angle 11-23-25 (Left Hip): 149.08 degrees

Angle 23-25-27 (Left Knee): 69.86 degrees



Angles:

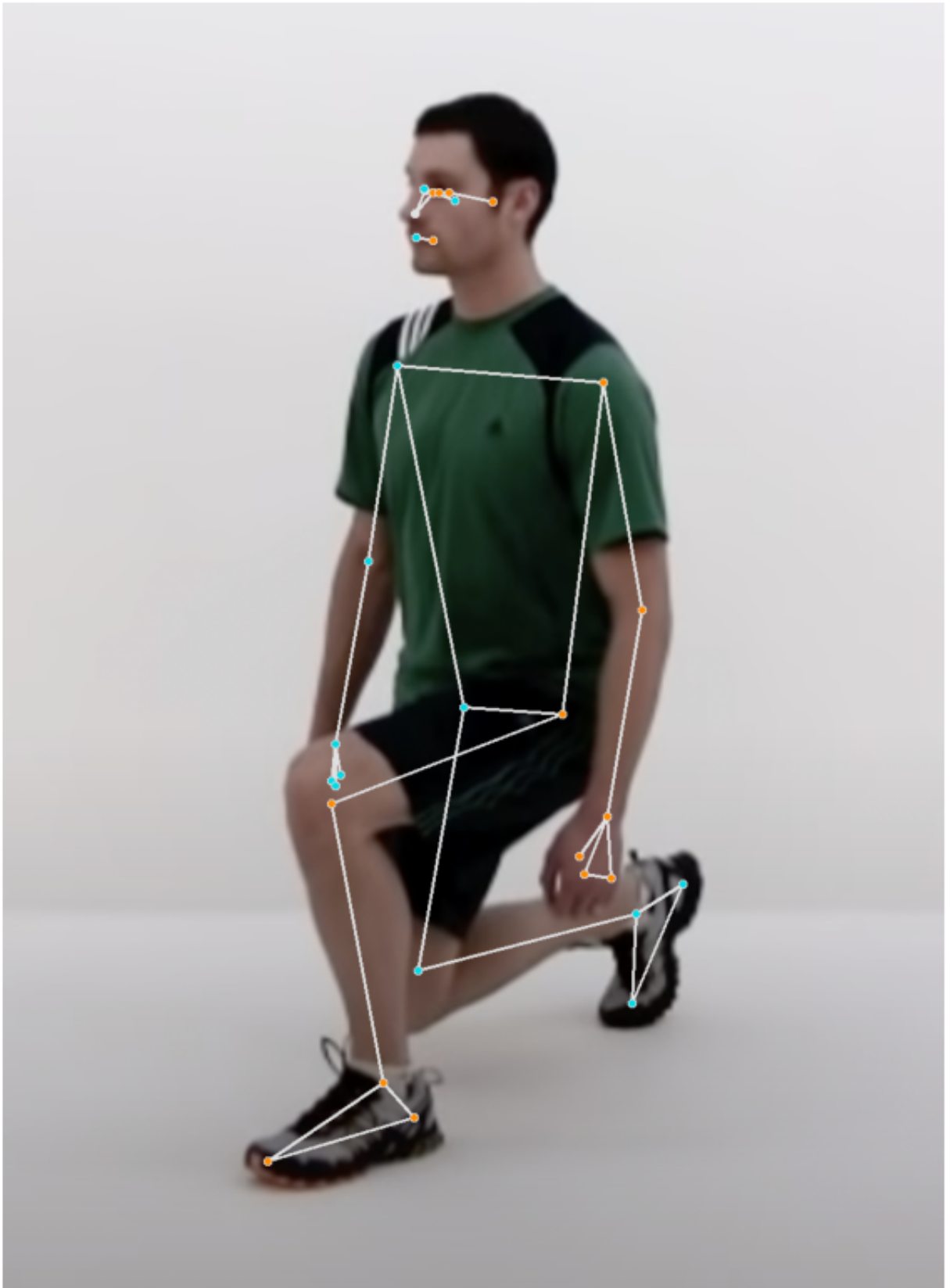
Angle 12-24-26 (Right Hip): 163.39 degrees

Angle 24-26-28 (Right Knee): 85.22 degrees

Angle 11-23-25 (Left Hip): 89.70 degrees

Angle 23-25-27 (Left Knee): 83.96 degrees





Angles:

Angle 12-24-26 (Right Hip): 177.55 degrees

Angle 24-26-28 (Right Knee): 162.11 degrees

Angle 11-23-25 (Left Hip): 157.99 degrees

Angle 23-25-27 (Left Knee): 150.55 degrees



Angles:

Angle 12-24-26 (Right Hip): 87.89 degrees

Angle 24-26-28 (Right Knee): 80.48 degrees

Angle 11-23-25 (Left Hip): 143.54 degrees

Angle 23-25-27 (Left Knee): 69.77 degrees



Angles:

Angle 12-24-26 (Right Hip): 166.42 degrees

Angle 24-26-28 (Right Knee): 75.80 degrees

Angle 11-23-25 (Left Hip): 82.38 degrees

Angle 23-25-27 (Left Knee): 77.77 degrees

