

Interactive Robotics Learning: Implementing Face Tracking with Curio

Cheat Sheet

Image Rotation Functions:

1. **frame_standard(frame)**
 - *Doesn't rotate the frame and uses it as it is.*
2. **frame_rotate_180(frame)**
 - *Rotates the frame 180 degrees.*
3. **frame_mirror(frame)**
 - *Flips the frame horizontally.*

Image Preprocessing (DNN Blob Creation):

1. **blob_standard(frame)**
 - *Standard preprocessing for DNN face detection.*
2. **blob_high_contrast(frame)**
 - *Increases contrast before creating the blob, which may enhance some face features but could introduce noise.*
3. **blob_high_brightness(frame)**
 - *Adds brightness, which may improve detection in darker areas but may oversaturate lighter areas.*

Face Detection Confidence:

1. **detect_faces_standard(detections)**
 - *Uses a balanced confidence threshold to detect faces.*
2. **detect_faces_high_confidence(detections)**
 - *Sets a high confidence threshold, ensuring only highly probable detections are used.*
3. **detect_faces_low_confidence(detections)**
 - *Sets a low confidence threshold, allowing more detections.*

Bounding Box Calculation:

1. **calculate_bounding_box_standard(detection, w, h)**
 - *Calculates bounding box coordinates without adjustment.*
2. **calculate_bounding_box_offset(detection, w, h)**
 - *Adds a small offset to the bounding box, expanding the area.*
3. **calculate_bounding_box_centered(detection, w, h)**
 - *Adds a centered buffer around the face.*

Robot Control (Sending Commands):

1. **control_standard(face_center_x, frame_center_x)**
 - *Uses a standard threshold to determine left, right, or stop commands.*
2. **control_slow_response(face_center_x, frame_center_x)**
 - *Uses a higher threshold, reduces jitter but leading to slower reaction times.*
3. **control_fast_response(face_center_x, frame_center_x)**
 - *Uses a lower threshold, responds quickly but can lead to jerky tracking.*