

Guide: How to Generate a Dataset for Steering Wheel Turns

This guide explains, step by step, how to record and prepare a dataset for steering wheel movements (turning right, left, and keeping neutral). It is written so that anyone can follow along, even without prior technical knowledge.

Step 1: Record the Movements

- Use Rokoko or another motion capture tool to record hand and wrist movements while turning a steering wheel.
- Capture three kinds of movements:
 - Turn Left
 - Turn Right
 - Neutral (hands on wheel, not turning)
- Each take should start and end in Neutral, with a smooth turn in between.

Step 2: Repeat Enough Times

- Perform several takes for each side (left and right).
- For balance, aim for about the same number of left and right turns (for example, 30 each).
- Include different speeds (slow, medium, fast) and different amplitudes (small, medium, large turns).

Step 3: Select Useful Columns

- From the exported data, focus on wrist rotation and wrist velocity columns (e.g., RightWrist_flexion, RightWrist_adduction, and their velocities).
- These are the best signals to represent steering wheel movement.

Step 4: Create a Steering Proxy Angle

- Combine the wrist rotation signals into a single angle value.
- Example: $\text{Steering Angle} = 0.7 \times \text{RightWrist_flexion} + 0.3 \times \text{RightWrist_adduction}$.
- Subtract the starting neutral value (baseline) so that Neutral = 0.

Step 5: Label the Data

- Use thresholds to decide the label for each frame:

- If Steering Angle $> +10 \rightarrow \text{turn_right}$
- If Steering Angle $< -10 \rightarrow \text{turn_left}$
- Otherwise $\rightarrow \text{neutral}$
- Add a new column 'steer_label' with these values.

Step 6: Save the Dataset

- Save the final dataset as a CSV file including:
 - Timestamp
 - Wrist features (flexion, adduction, velocities)
 - Steering proxy angle
 - Steering label (turn_left, turn_right, neutral)

With this dataset, you can now train a machine learning model to recognize or generate steering wheel turns.