

Chapter 6 — Model Training (Rosmaster R2)

[DIAGRAM — TRAINING FLOW]

Collect Data → Store Images → Train Model → Save Model → Run Autopilot

1. Overview

Model training teaches the robot how to steer by learning from examples you record.

2. What Data Looks Like

Images + steering labels. Robot learns what 'center' looks like.

3. Record Training Data

Start data capture:

`rosrun r2_ai record_data.py`

Drive robot manually between lines.

4. Data Structure

dataset/

 — images/

 — labels.csv

Ensure images and labels match.

5. Start Training

`python3 train_lane_model.py --data dataset/ --output lane_model.pth`

6. Training Time

On Xavier NX: usually 2–10 minutes depending on dataset size.

7. Load & Test Model

`rosrun r2_ai lane_follow.py --model lane_model.pth`

8. Improve Accuracy

- More data
- Better lighting
- Smooth steering during recording