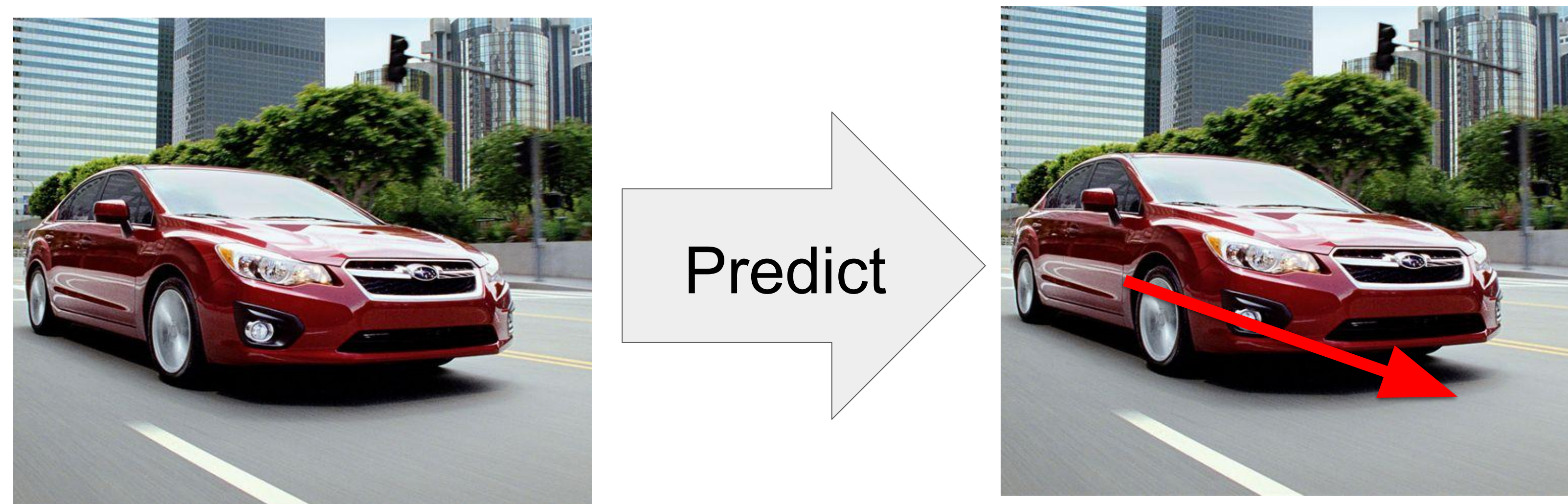




### Research Question

How to represent vehicle angles such that it improves deep learning prediction accuracy?



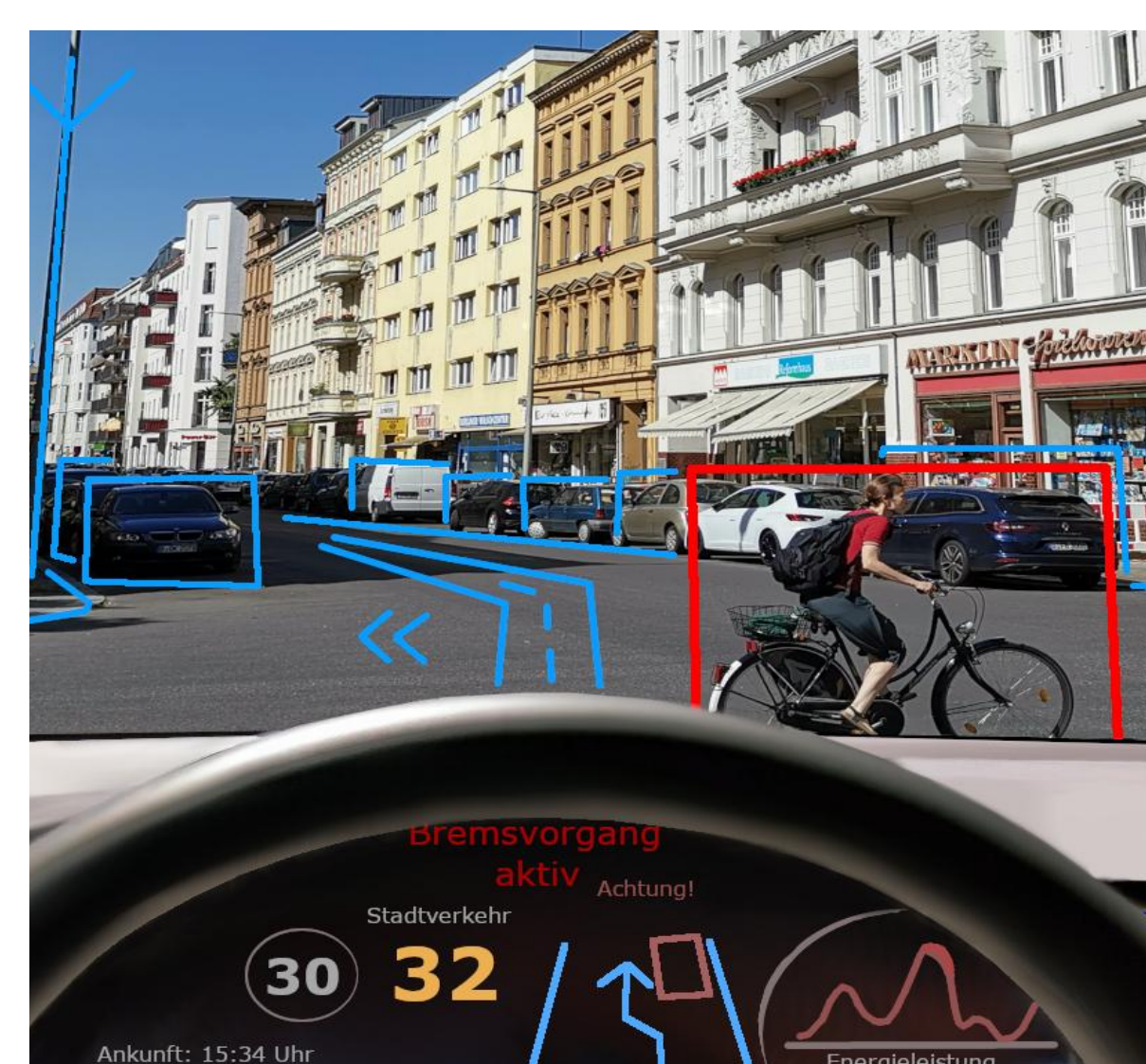
### Potential Applications



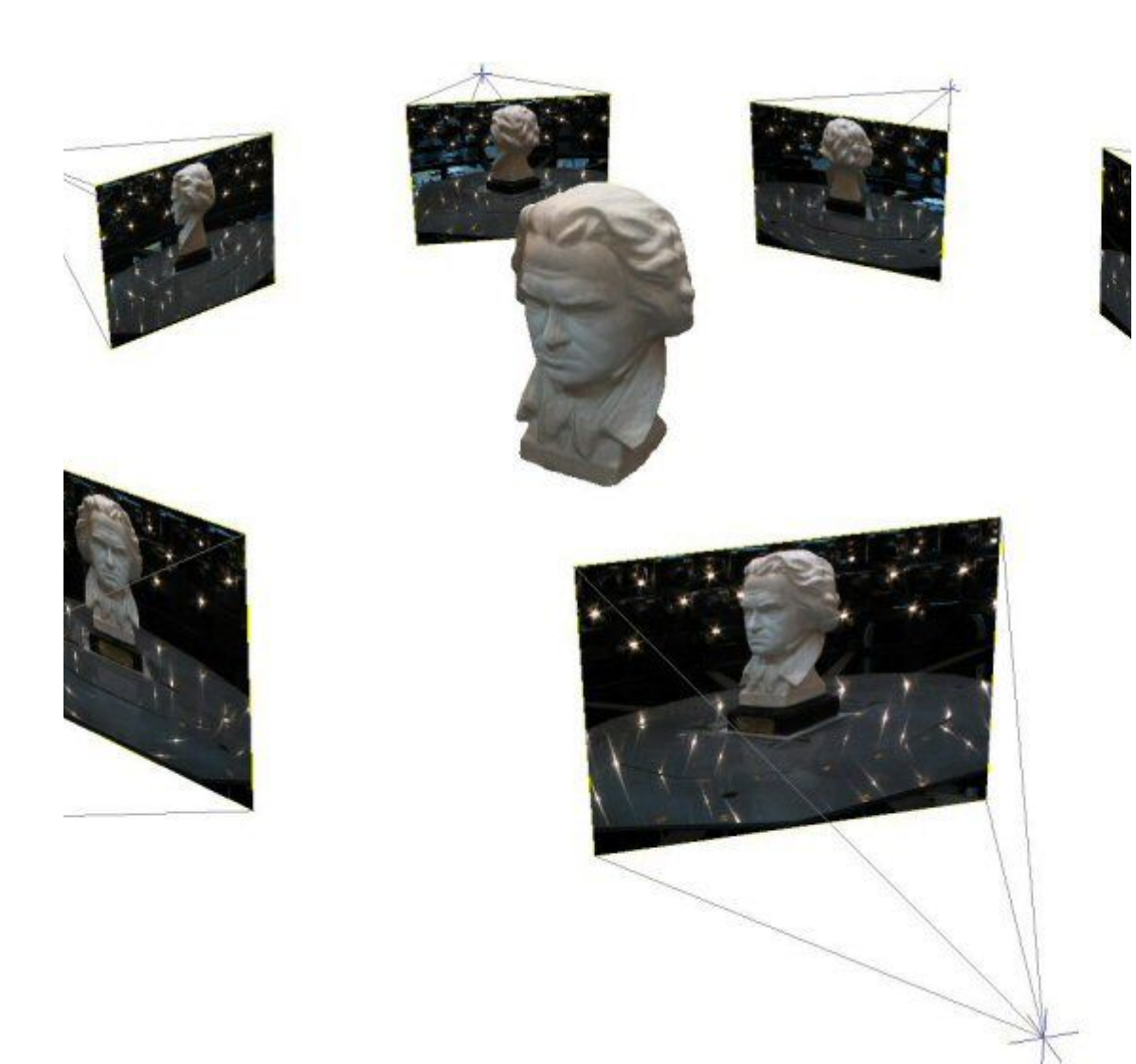
Robotic Navigation



Movement Tracking

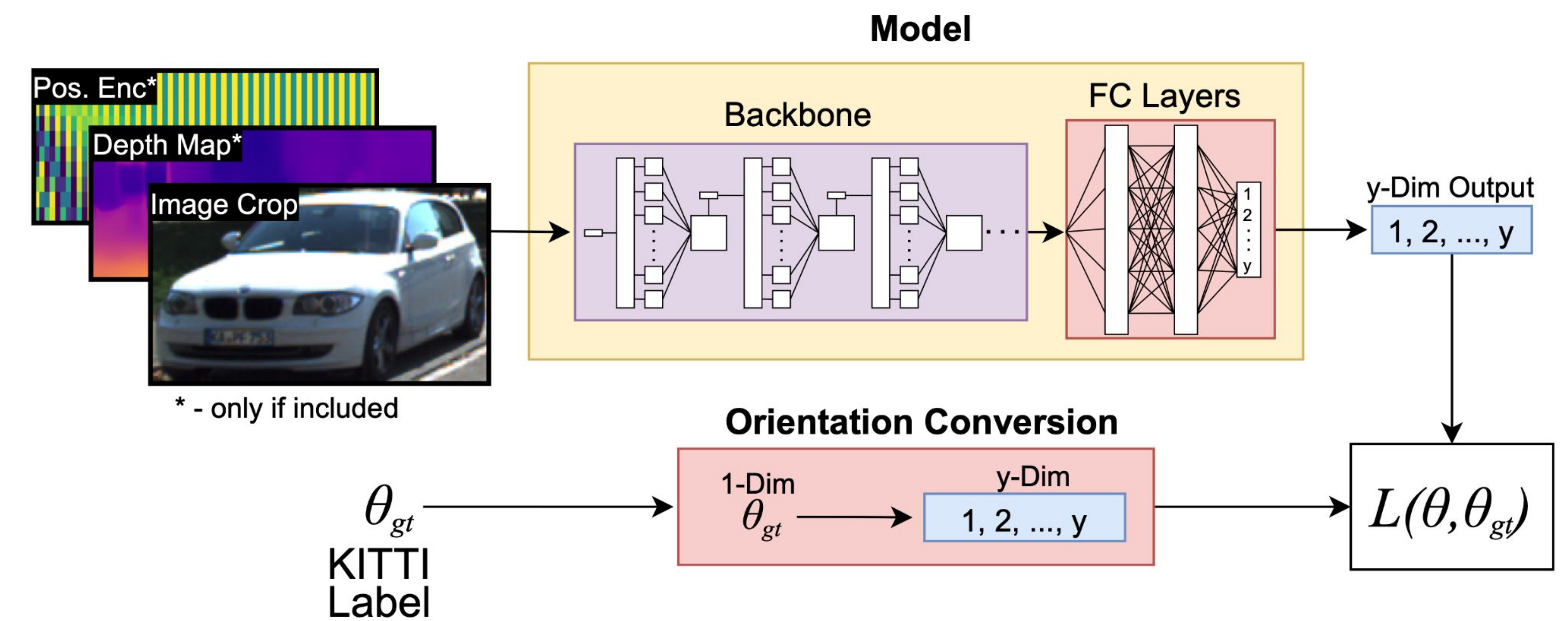


Autonomous Driving

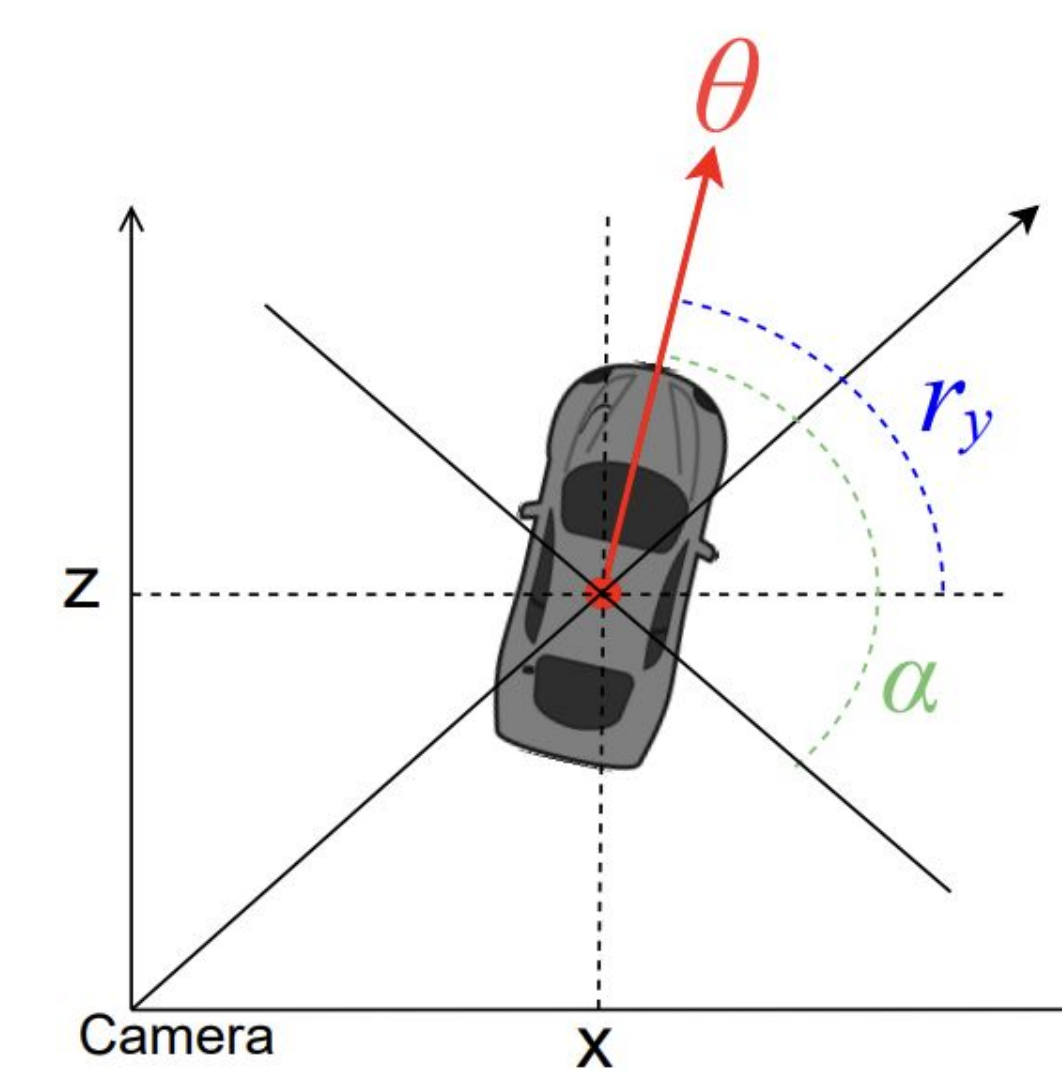


3D Reconstruction

### Model Architecture

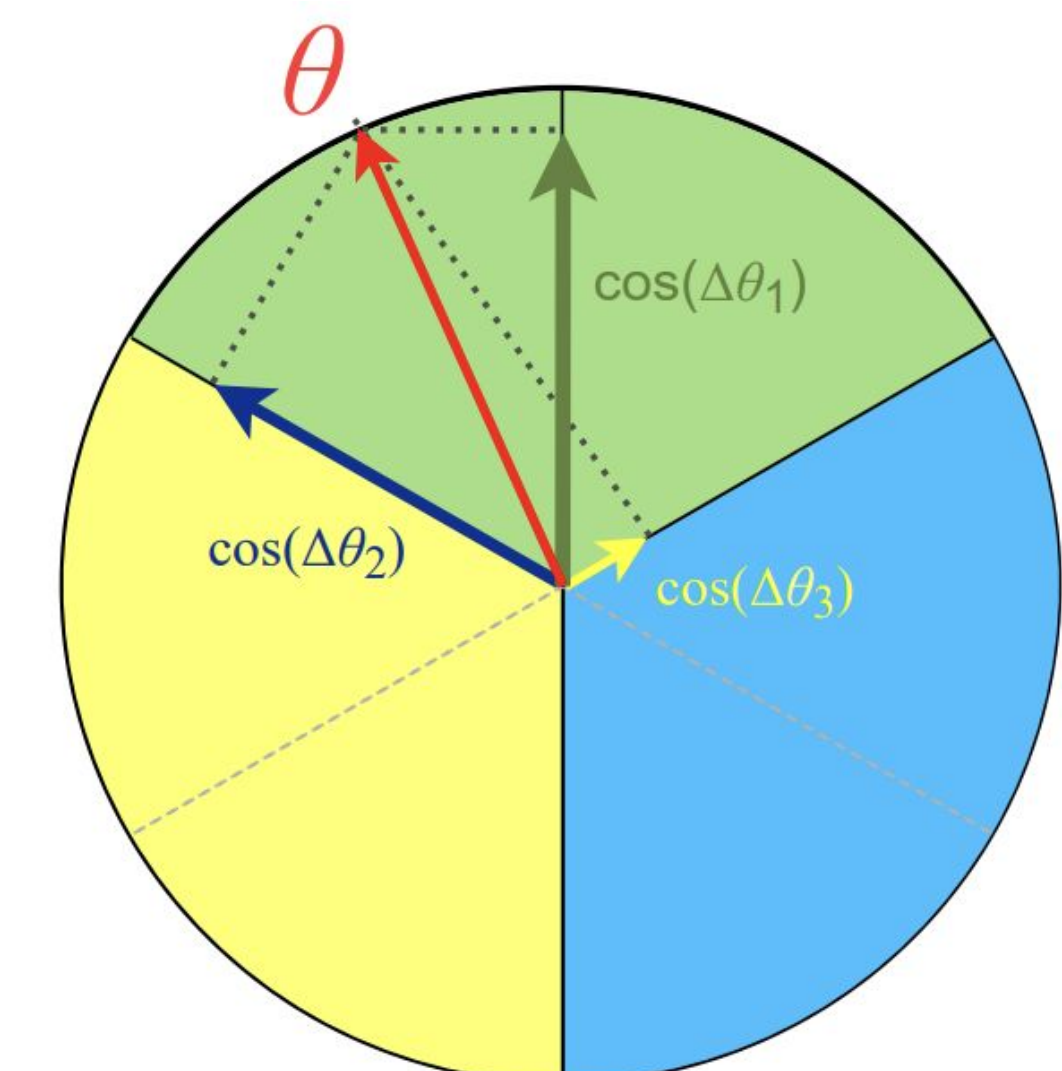


### Experiment Results



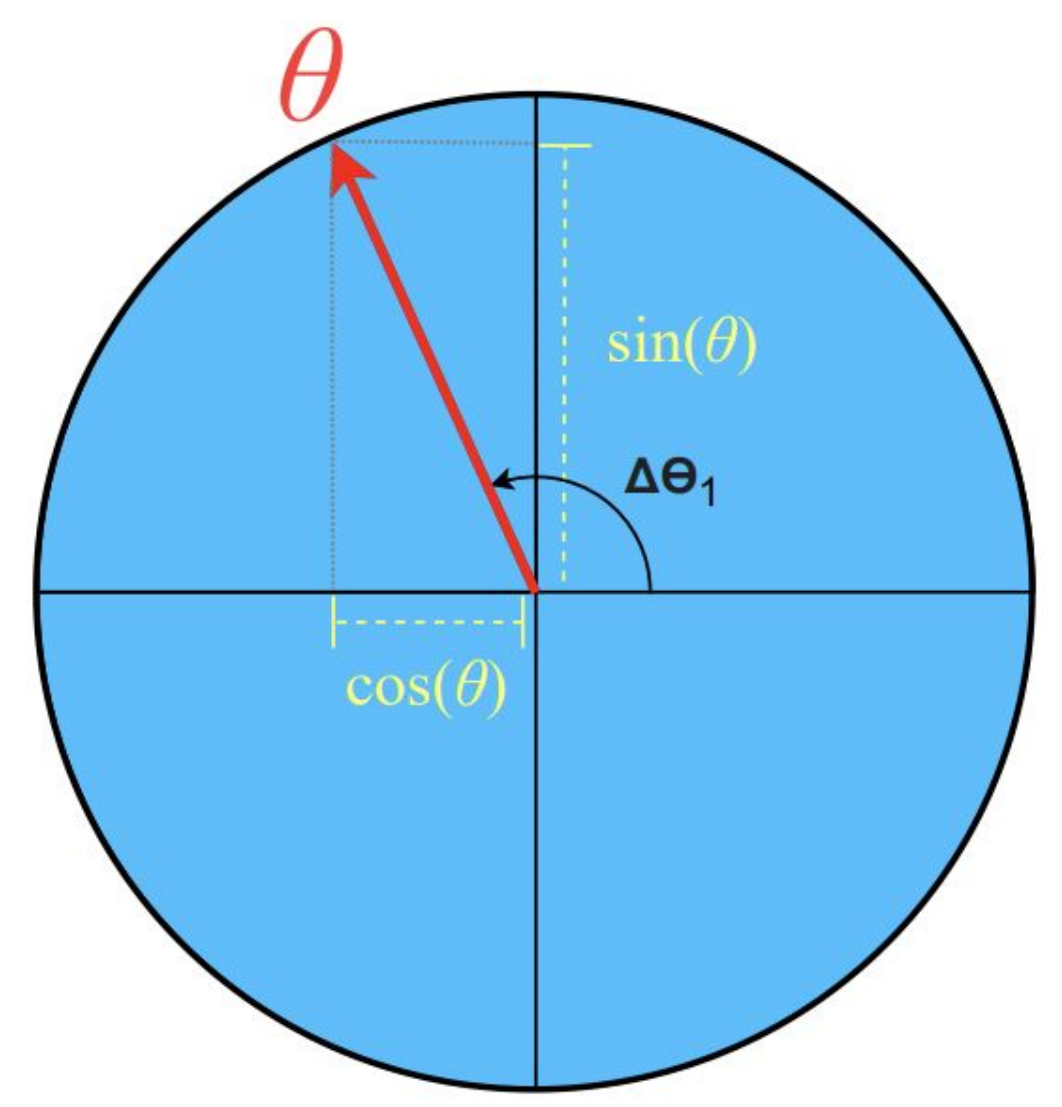
**Radians**  
Represent the vehicle rotation angle in radians.

Validation Accuracy: 90.49%



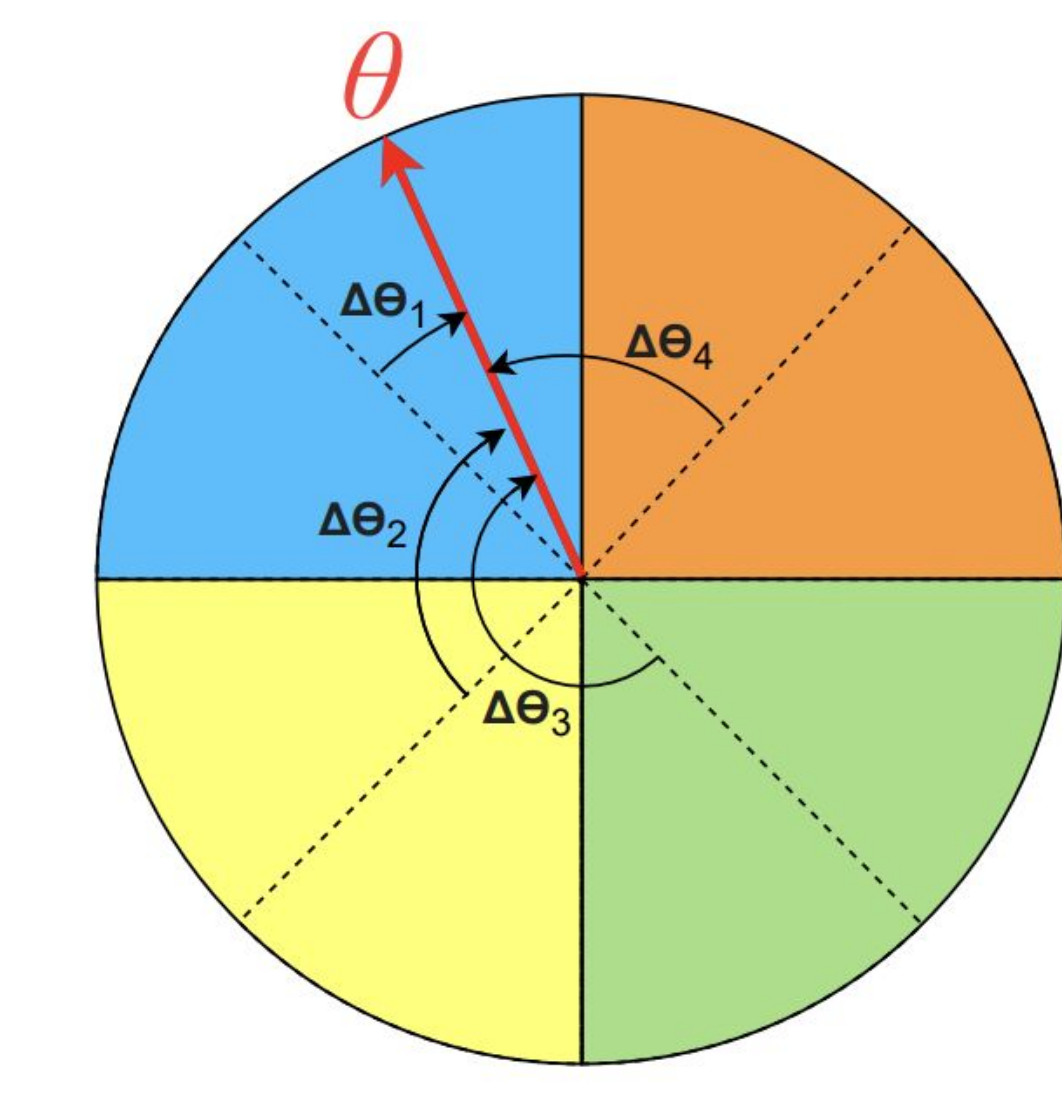
**Tricosine**  
Represent the angle as the cosine distances to three bin centers.

Validation Acc: 94.25% (↑4.15%)



**Cartesian**  
Represent angle as a pair of horizontal and vertical coordinates.

Validation Accuracy: 94.82% (↑4.33%)



**Multi-Regression**  
Represent the angle from multiple bin centers where each is represented with Cartesian.

Validation Acc: 83.30% (↓7.94%)