



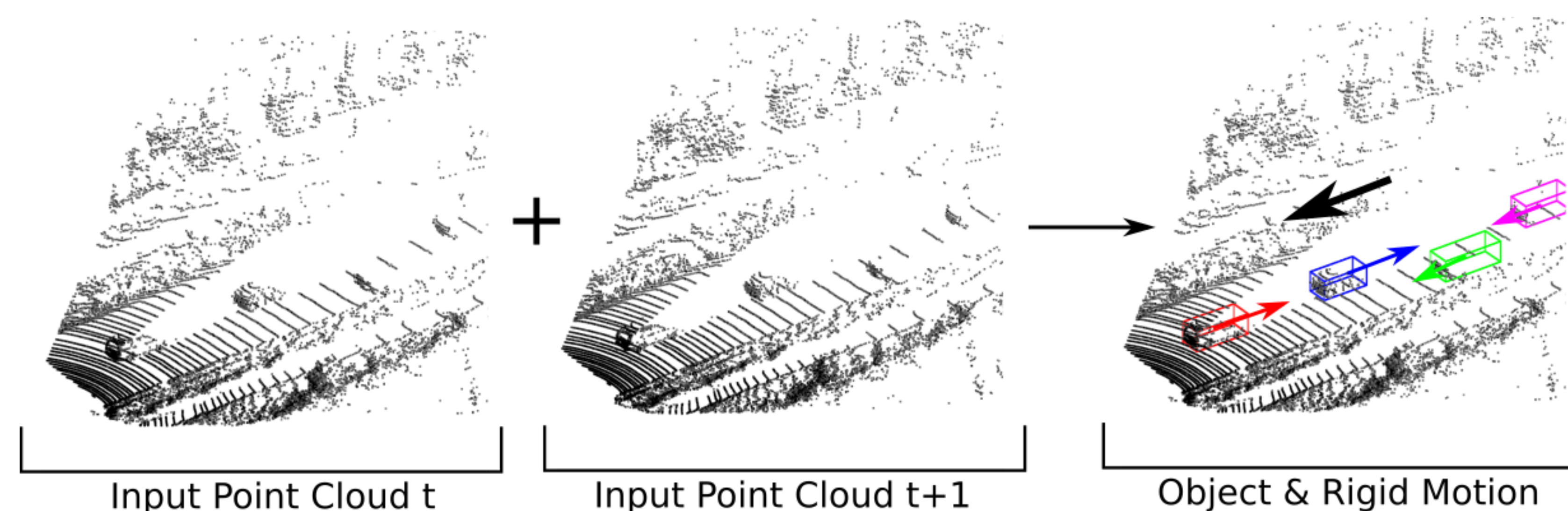
PointFlowNet : Learning Representations for Rigid Motion Estimation from Point Clouds

Aseem Behl, Despoina Paschalidou, Simon Donne, Andreas Geiger
MPI-IS Tübingen, University of Tübingen



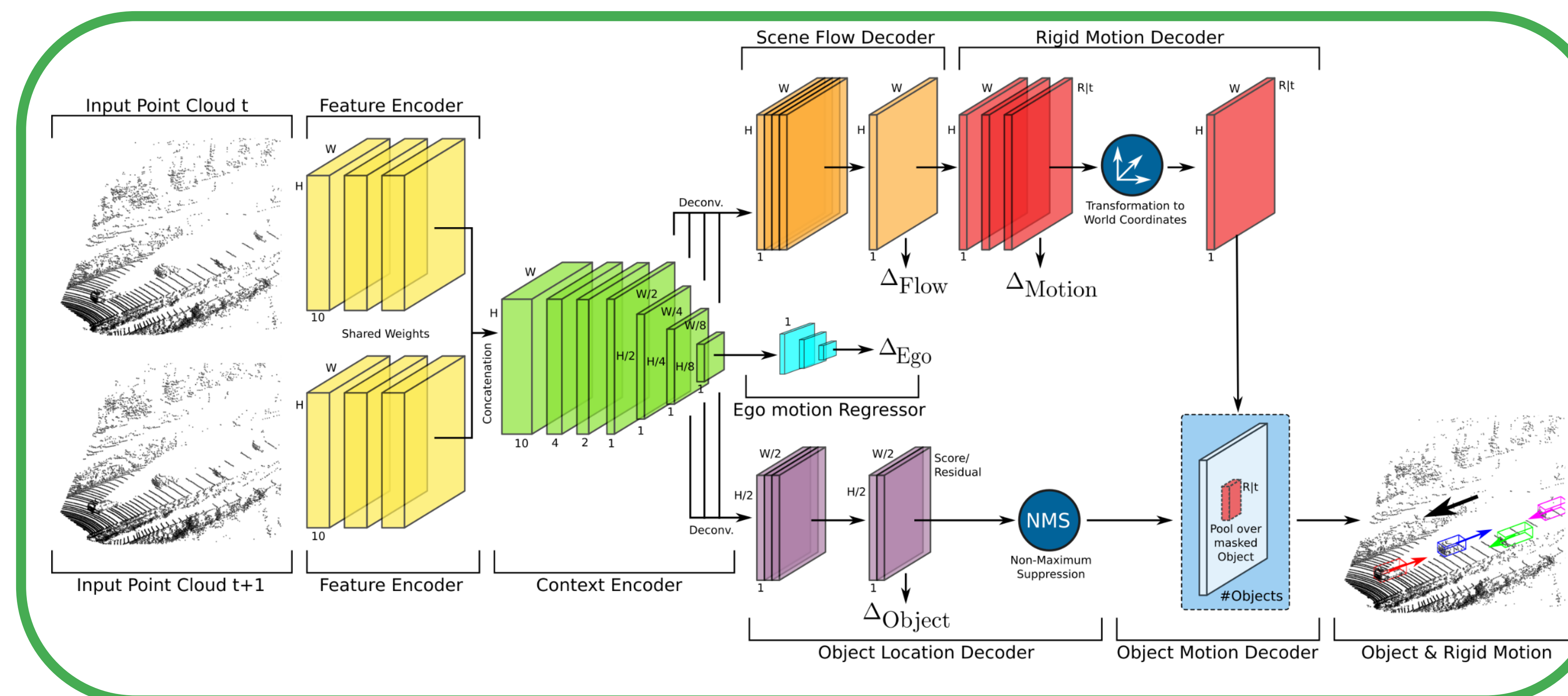
Motivation

Task: Predict 3D scene flow, 3D bounding box, rigid motion of objects in 3D point clouds from LIDAR



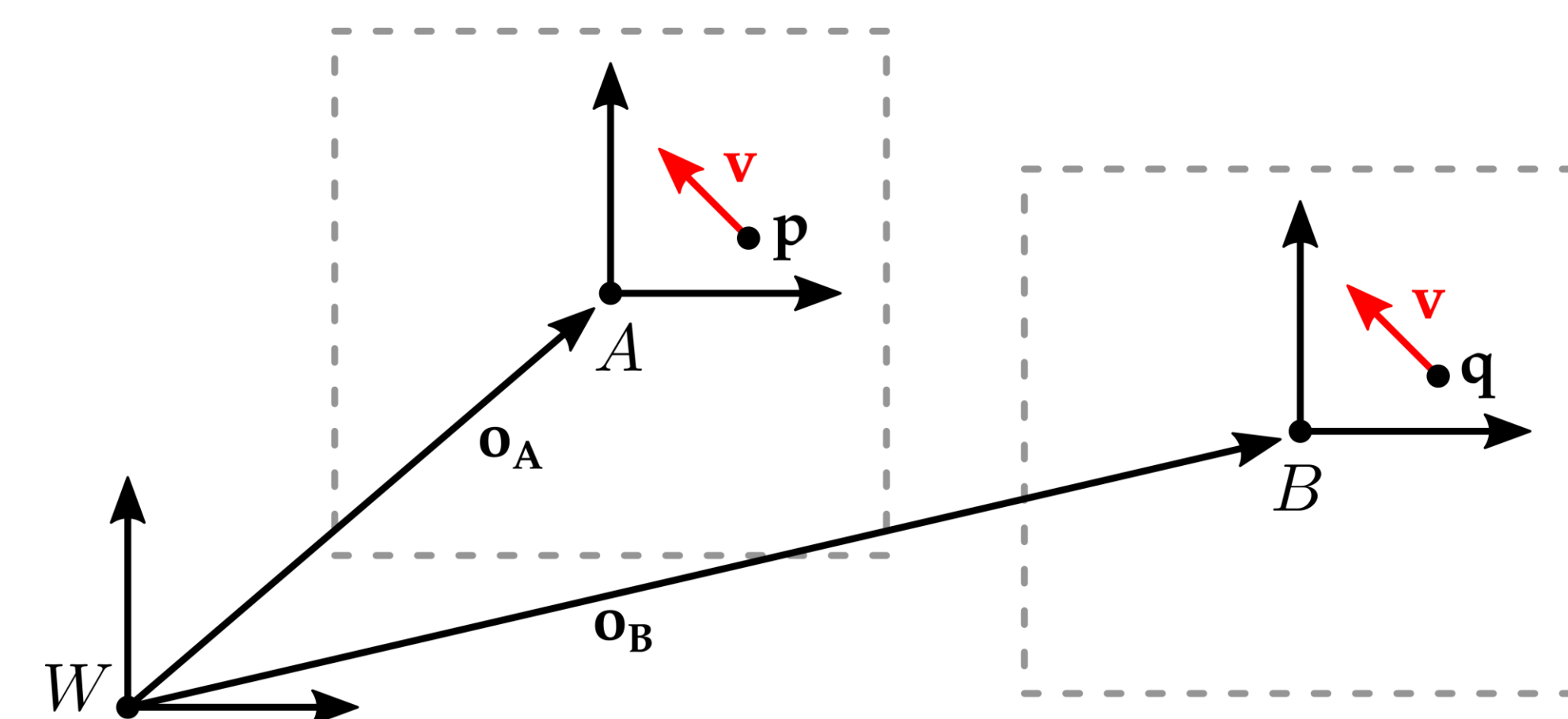
- Modern self-driving car platforms rely on LIDAR technology for 3D geometry perception
- Laser scanners provide a **360 degree field of view** with just one sensor
- Generally unaffected by lighting conditions
- Do not suffer from the **quadratic error behavior of stereo cameras**
- Most leading image-based scene flow methods take several minutes to predict 3D scene flow

Architecture



Rigid Motion Representation

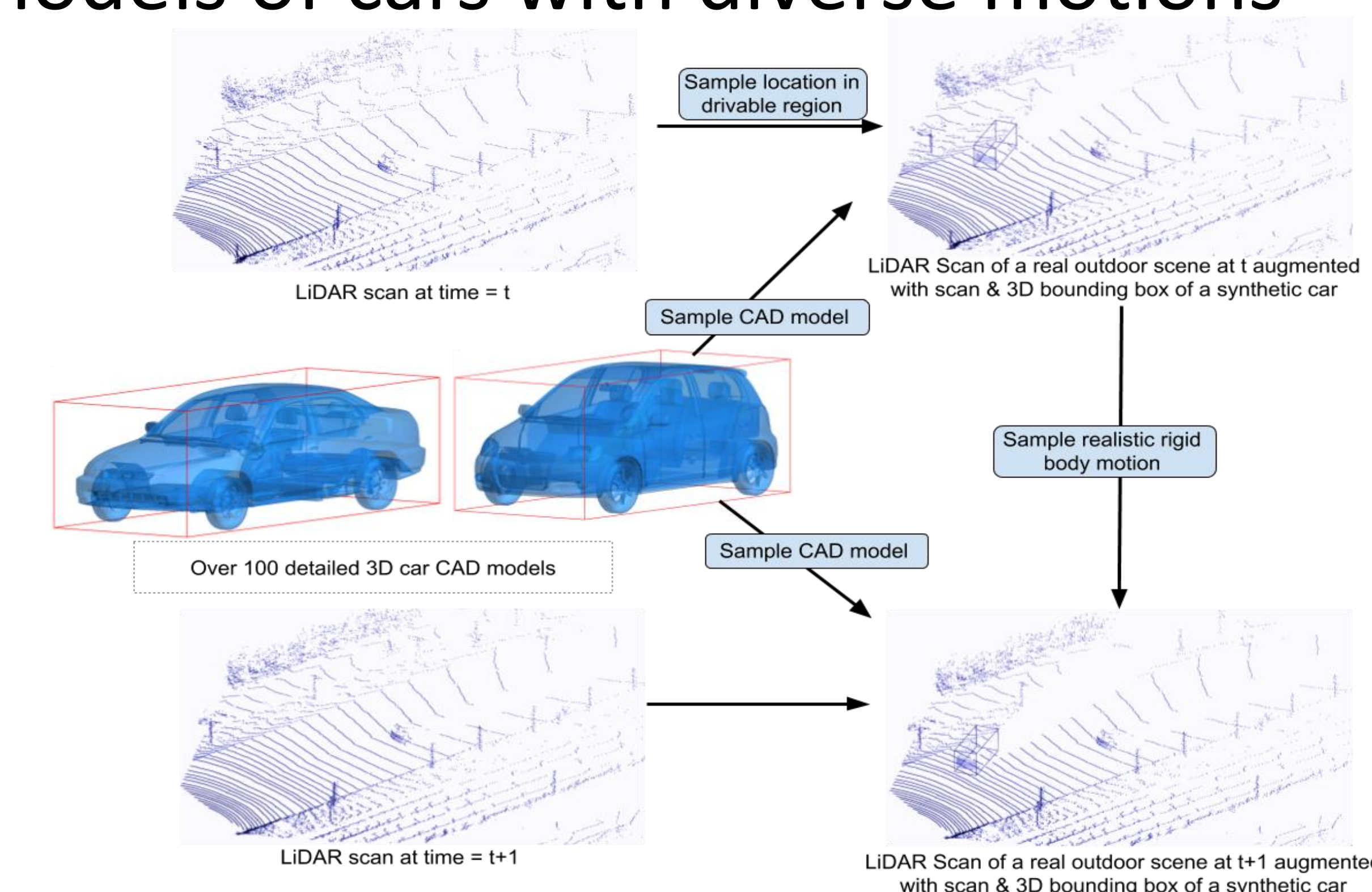
Challenge: Identical regions of flow lead to different global rigid body motions, depending on the location



- Our local representation is translation equivariant
- Amenable to fully convolutional inference

Experiments

Training Data: KITTI scans augmented with 3D CAD models of cars with diverse motions



Qualitative comparison:

