



Main takeaways

- **DOC-Depth** produces **high-quality, fully dense depth maps** from LiDAR data, overcoming the limitations of sparse depth annotations.
- **DOC** classifies **dynamic object**, ensuring accurate depth reconstruction in dynamic environments.
- **DOC-Depth** is **learning-free, scalable**, and **agnostic to LiDAR sensors**. It is suitable for large-scale depth dataset generation.
- All software components and the fully-dense KITTI annotations are publicly available.



Project page

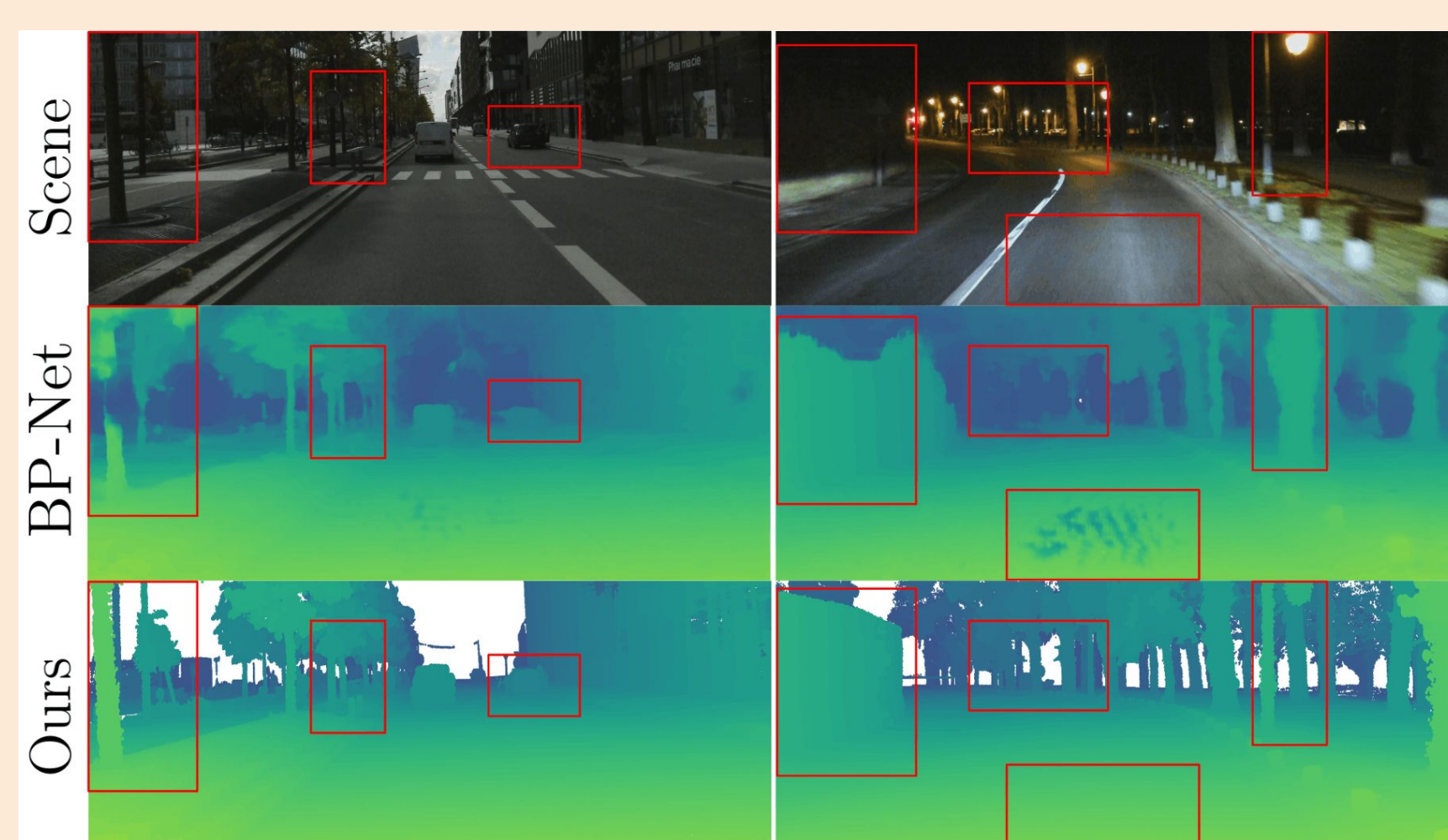


Code

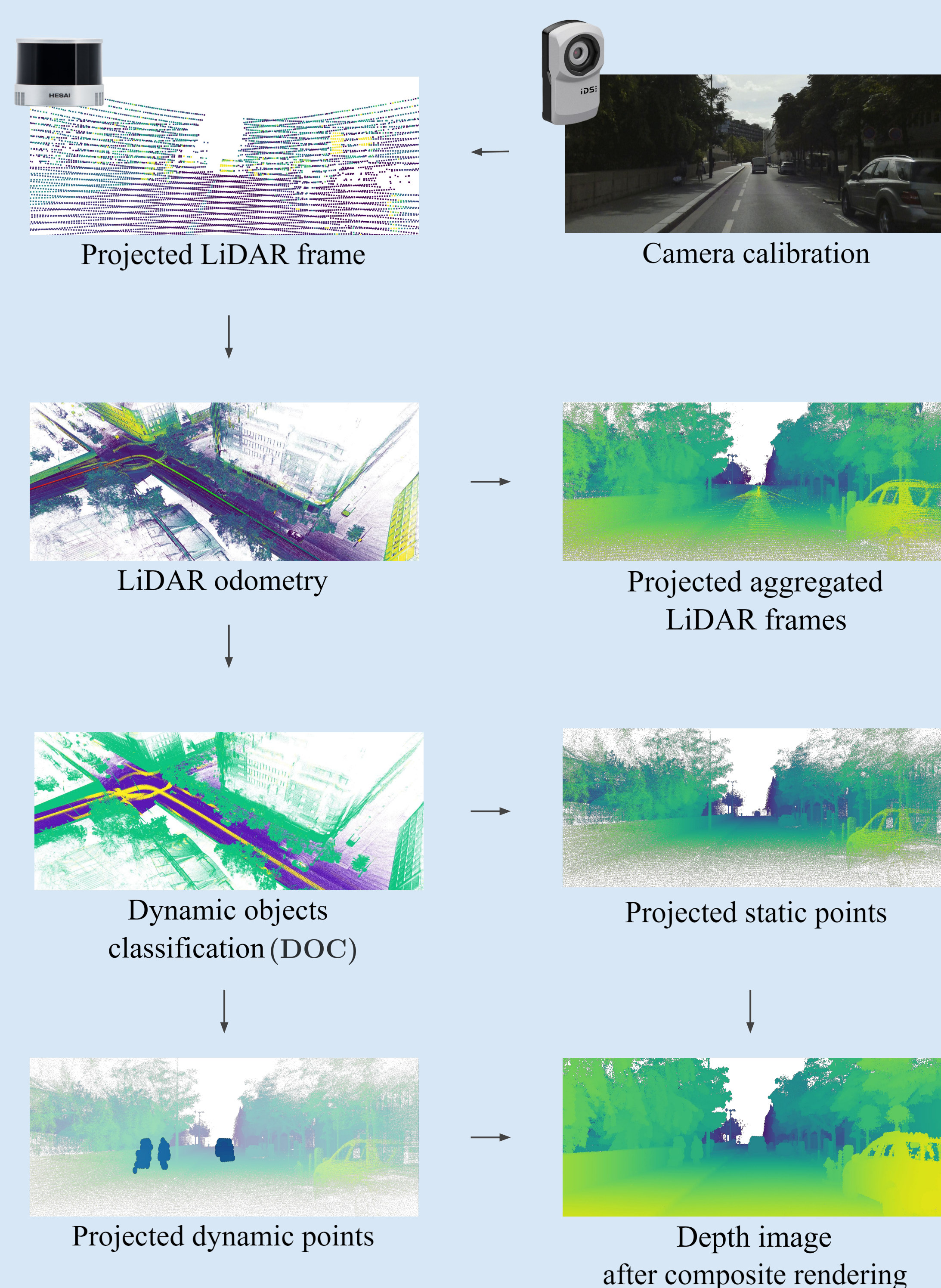
Motivation

- **Depth information is essential** for many applications in **robotics** and **autonomous driving**.
- Existing **datasets rely on sparse** measurement from **LiDAR**. Available **densification methods lead to inaccuracies**.
- Using **dense depth ensures better guidance** for downstream tasks while being **more data-efficient**.

Comparison to AI depth completion

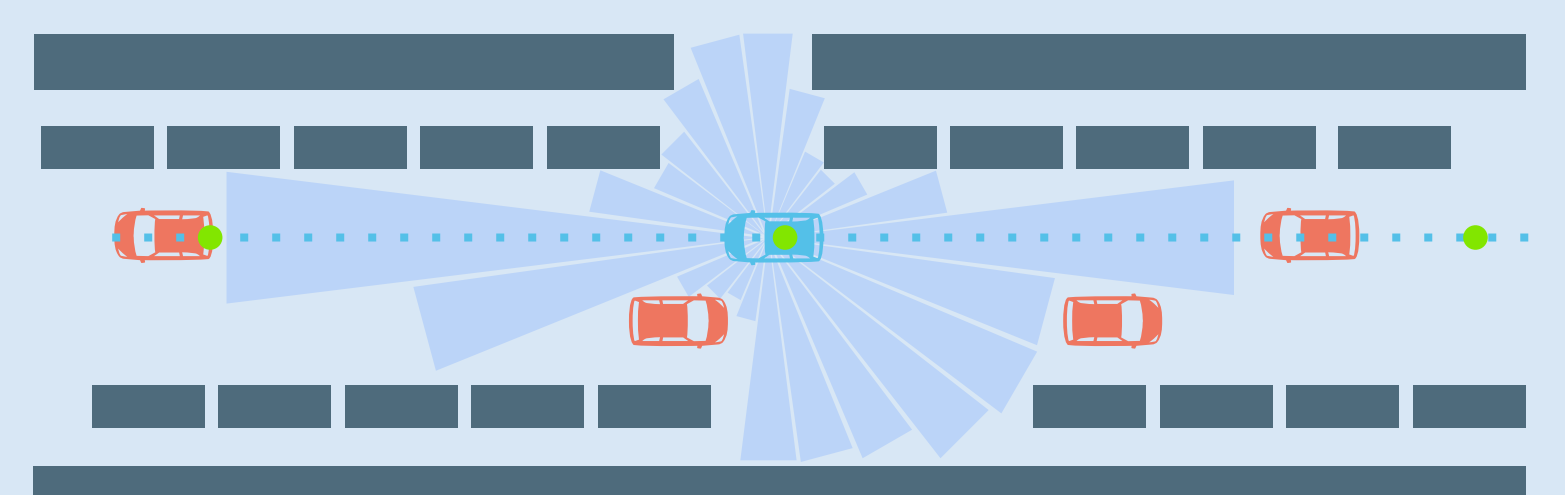


Method

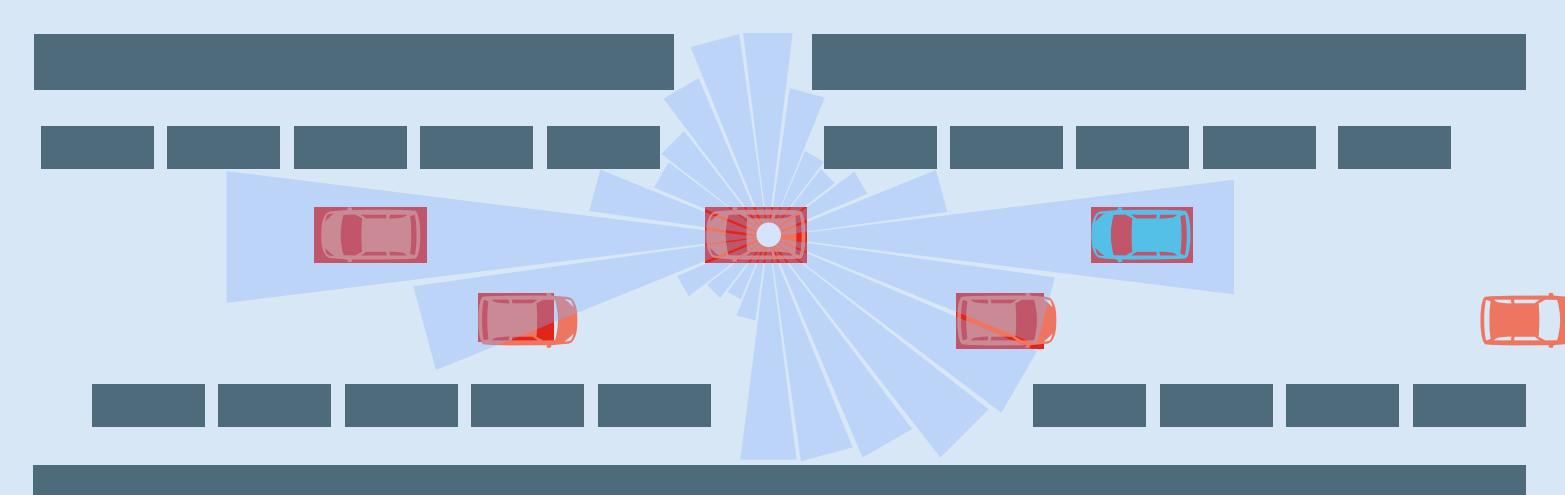


DOC

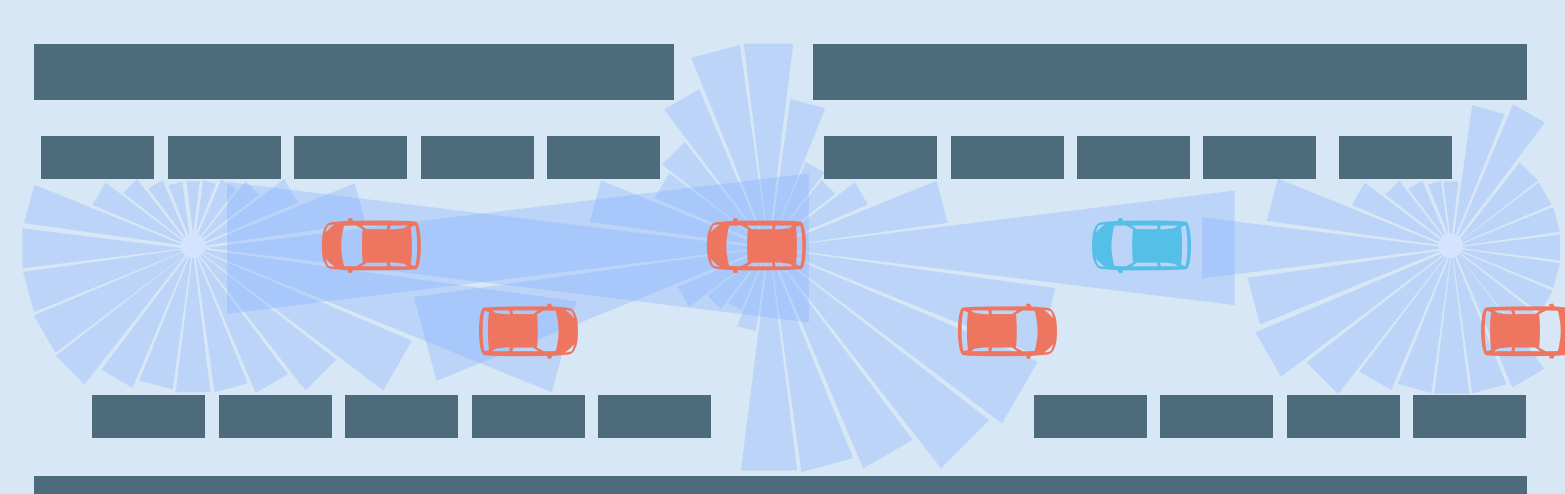
1) Keyframes free-space estimation



2) LiDAR frame reprojection



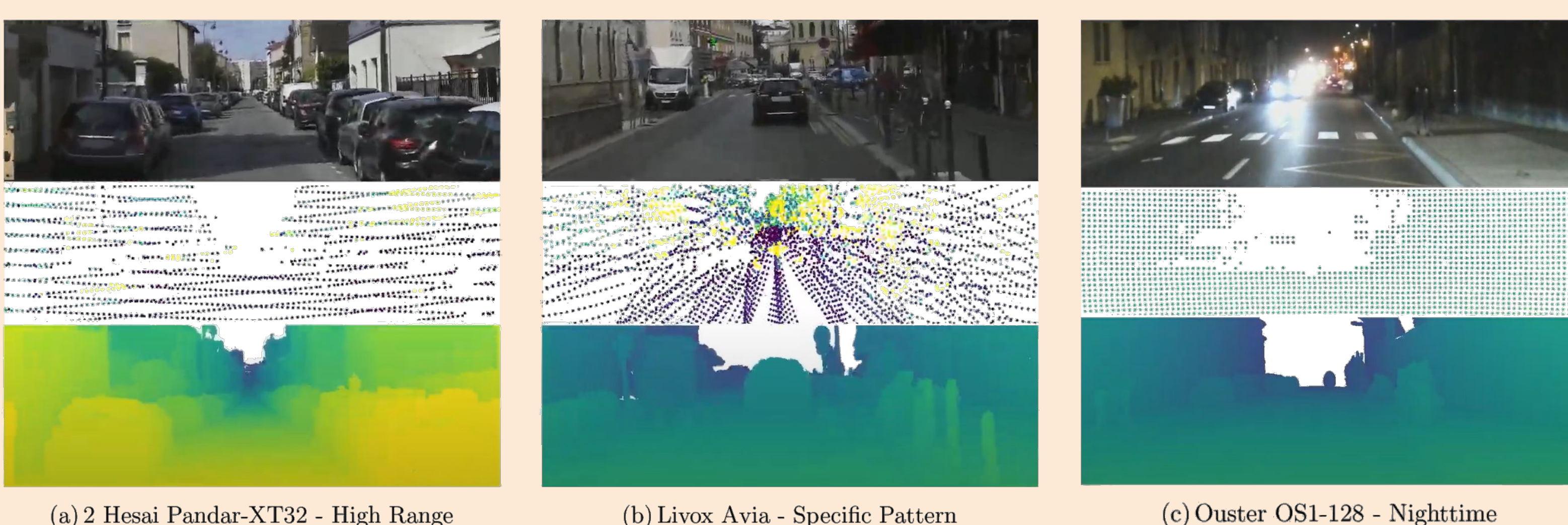
3) Vote



Classification on KITTI

Method	SA (%) ↑	DA (%) ↑	F1-score ↑
MapCleaner	99.25	97.02	0.9812
Dynablox	96.96	82.46	0.8912
BeautyMap	97.42	96.55	0.9698
DOC (Ours)	99.69	98.31	0.9899

LiDAR-agnostic method



Scalable dataset generation

LiDAR	Area	Recording Time	Processing Time	# Depth Map	Density
OS1-128	City / Country roads	30 min	111 min (×3.7)	13,700	79%
2 Pandar-XT32	City / Highway	41 min	128 min (×3.1)	15,500	76%
Avia	City	14 min	24 min (×2.2)	3,200	86%

Comparison to KITTI

