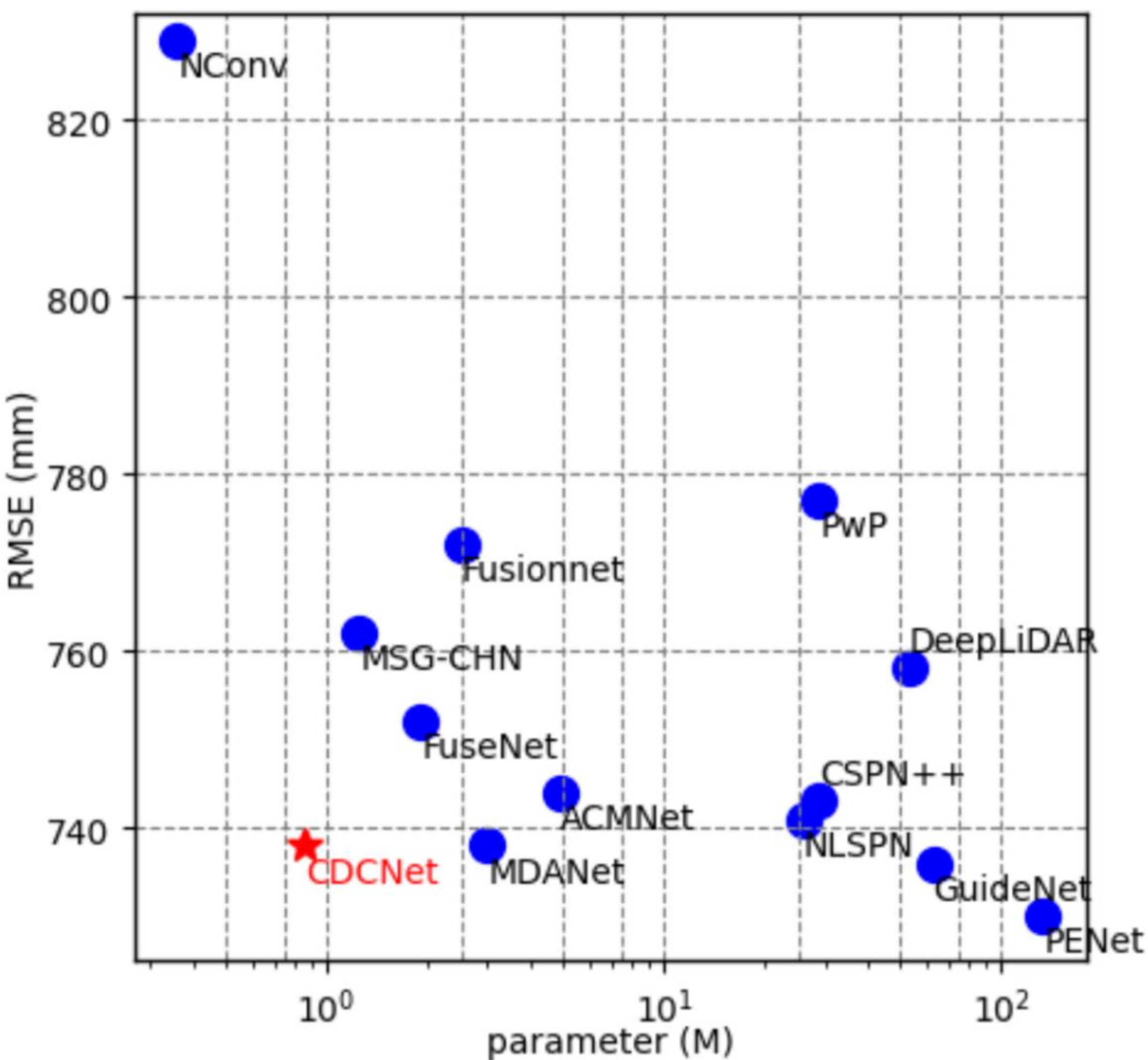


A Cascade Dense Connection Fusion Network for Depth Completion

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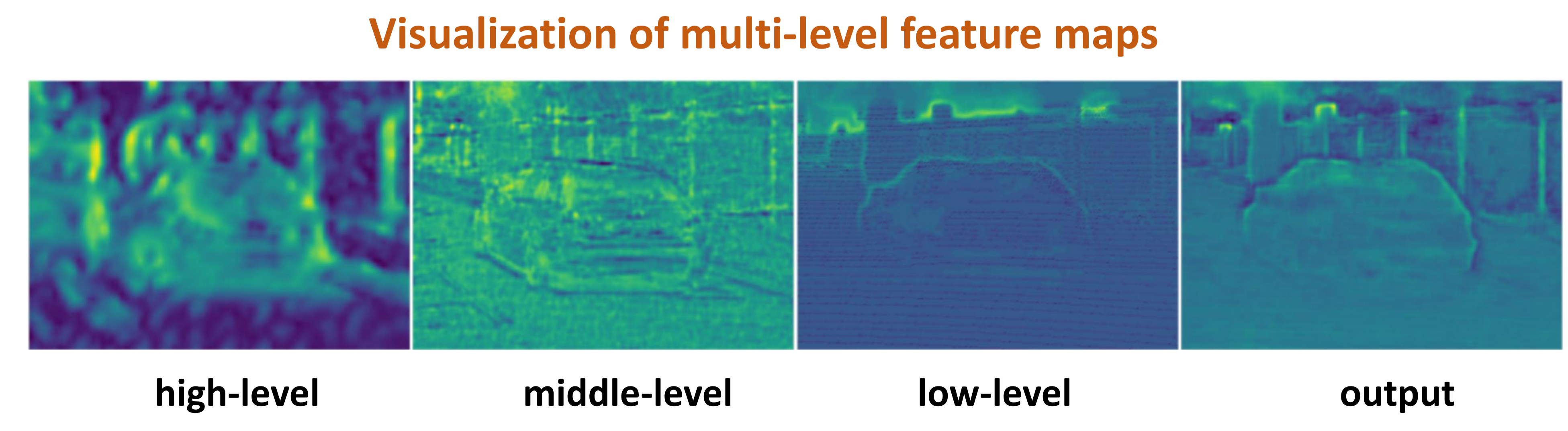
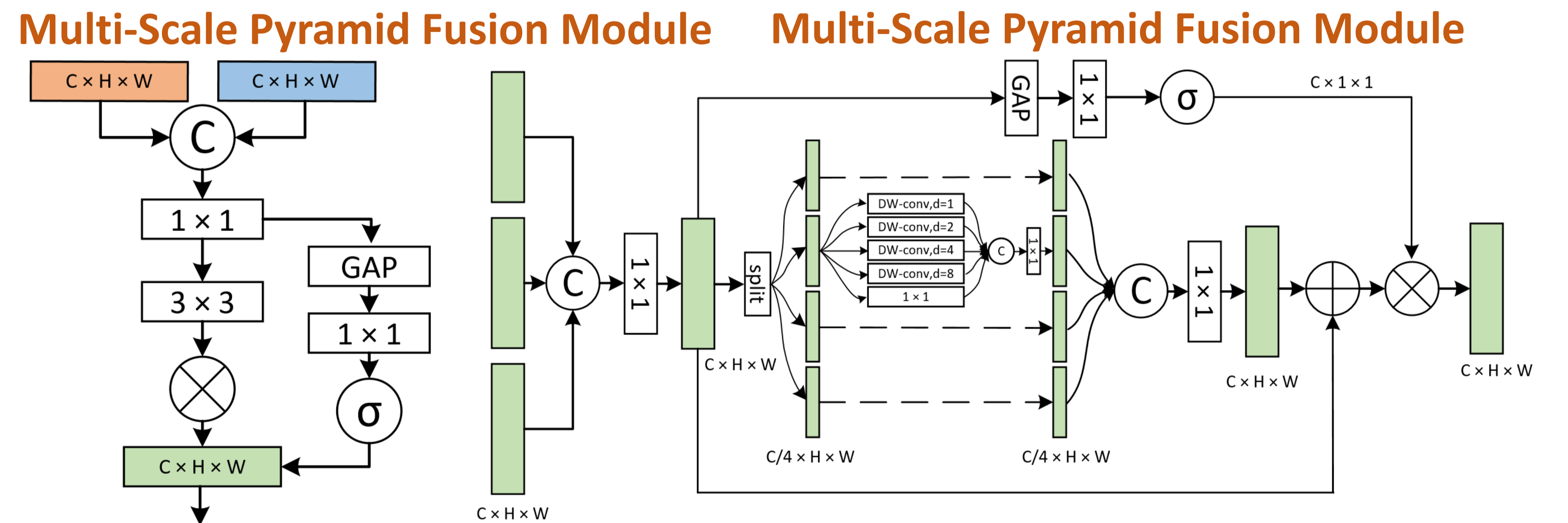
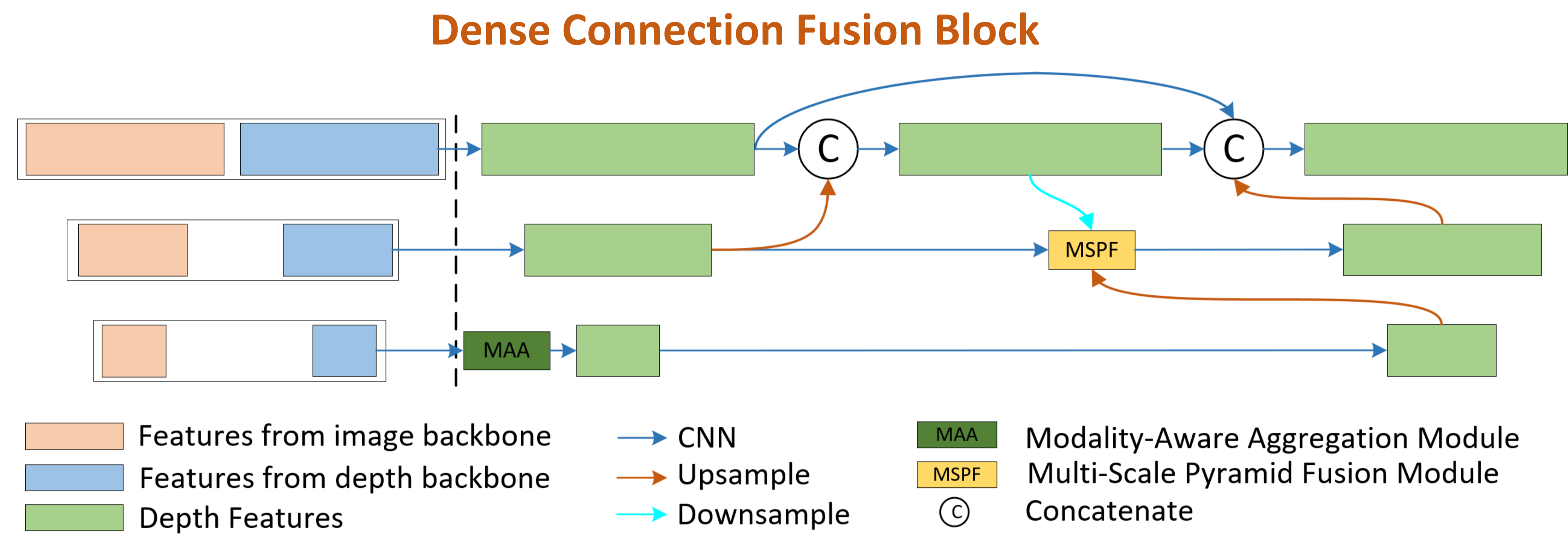
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Problems in existing depth completion works:
 High-performance models are heavy;
 Lightweight models fail to get high quality depth map.
Image-guided Depth Completion
 Color images have color cues, e.g., rich semantic and object boundaries of the scene; Sparse depth maps have strong distance-perceptive information. Image-guided depth completion generate a dense depth map.

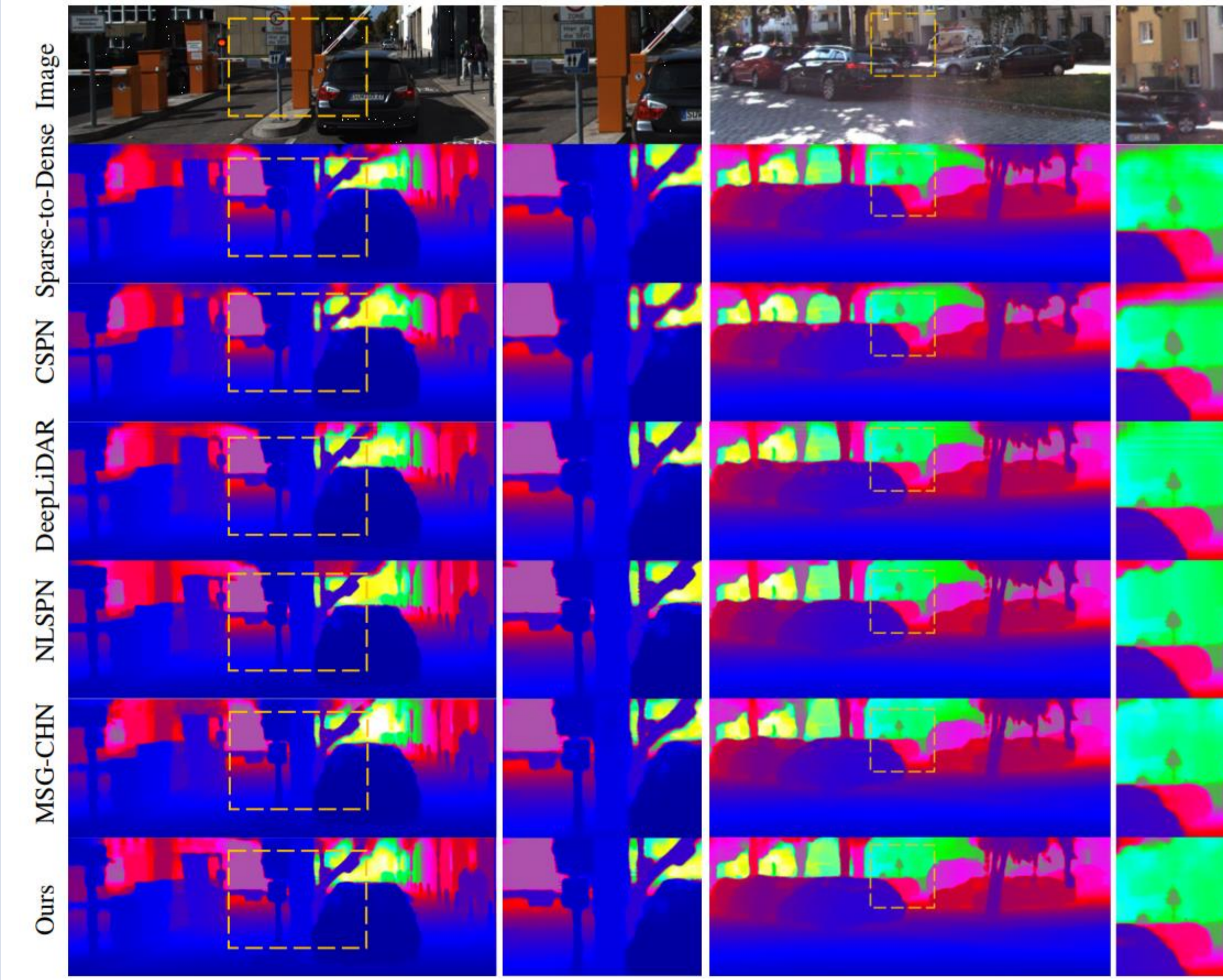


We propose a lightweight Cascade Dense Connection fusion Network (CDCNet) for depth completion.



Comparison with SOTA: KITTI dataset

Methods	Parameters (M)	RMSE (mm)	MAE (mm)	iRMSE (1/km)	iMAE (1/km)	runtime (s)
Sparse-to-Dense [27]	-	814.73	249.95	2.80	1.21	0.08
PwP [45]	29.10	777.05	235.17	2.42	1.13	0.10
FusionNet [40]	2.50	772.87	215.02	2.19	0.93	0.02
FuseNet [2]	1.90	752.88	221.19	2.34	1.14	0.09
NConv [7]	0.36	829.98	233.26	2.60	1.03	0.02
DeepLiDAR [36]	53.40	758.38	226.50	2.56	1.15	0.35
CSPN [3]	-	1019.64	279.46	2.93	1.15	1.00
CSPN++ [4]	28.80	743.69	209.28	2.07	0.90	0.20
NLSPN [30]	25.80	741.68	199.59	1.99	0.84	0.13
PENet [13]	133.70	730.08	210.55	2.17	0.94	0.16
GuideNet [38]	63.30	736.24	218.83	2.25	0.99	0.14
ACMNet [50]	4.90	744.91	206.09	2.08	0.90	0.35
MDANet [17]	3.07	738.23	214.99	2.12	0.99	0.03
MSG-CHN [19]	1.25	762.19	220.41	2.30	0.98	0.01
CDCNet (ours)	0.87	738.26	216.05	2.18	0.99	0.03



Conclusion
 CDCNet achieves competitive results compared to state-of-the-art methods with much fewer parameters on the KITTI depth completion benchmark.