## Machine learning-based occupancy grid mapping

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## Abstract

In this note, there are contents and comments on ML-based occupancy grid mapping algorithms. This is the public version of a private copy of the note. It might be updated in the future.

I. TABLE OF WORKS

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TABLE I: Table of Deep Learning-based OGM methods

Type	Name	Year	Code	Structure	Input	Output	Comments	Pro	Con
Single modal	RadarOcc [1]	2024	<b>√</b>	transformer	4D radar	3D SSC		<ul> <li>DL structure help 4D radar feature learning (i.e., doppler)</li> <li>second point</li> </ul>	
	Occ3D [2]	2023	✓	transformer	RGB	3D SSC			
	VoxelNet [3]	2017	$\checkmark$	CNN	LiDAR	3D box			
	SurroundOcc [4]	2023	$\checkmark$	transformer	RGB	3D SSC			
	DeepISM [5]	2019	×	VAE	radar	2D OGM	Evidence available		
	Evidential DeepISM [6]	2019	×	VAE	radar	2D (E)OGM	Evidence available		
	PointPillars [7]	2019	$\checkmark$	CNN	LiDAR	3D box			
	OccupancyNet [8]	2019	×	CNN	radar BEV	2D OGM			
	SemanticPON [9]	2020	✓	STPN	RGB	2D SSC			
	MotionNet [10]	2020	✓	STPN	LiDAR	2D OGM			
	EviLOG [11]	2021	✓	CNN	radar	2D EOGM			
	RPFA-Net [12]	2021	×	CNN	radar	2D OGM			
Single sensor augmented			×						
			×						
			×						
Multi- sensors	MVDNet [13]	2021		CNN	radar	2D		<ul> <li>Multi-sensor</li> </ul>	
	ST-MVDNet [14]	2022	×		LiDAR	box			• High
	ST-MVDNet++ [15]	2023	×					fusion	computation
	MV3D [16]	2017	$\checkmark$	CNN	LiDAR camera	3D box		• S	cost • Complex
	DTW [17]	2018	×	CNN+RNN	LiDAR	2D OGM+bo	x		architecture
	AVOD [18]	2018	✓	CNN	LiDAR camera	3D box			
	FISHING [19]	2020	×	CNN	radar LiDAR camera	3D box	Limited semantic, some obstacles are not detected		
	RadarNet [20]	2020	×	CNN	radar LiDAR	3D box			

Note: SSC: Semantic Scene Completion, OGM: Occupancy Grid Map, EOGM: Evidential OGM

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