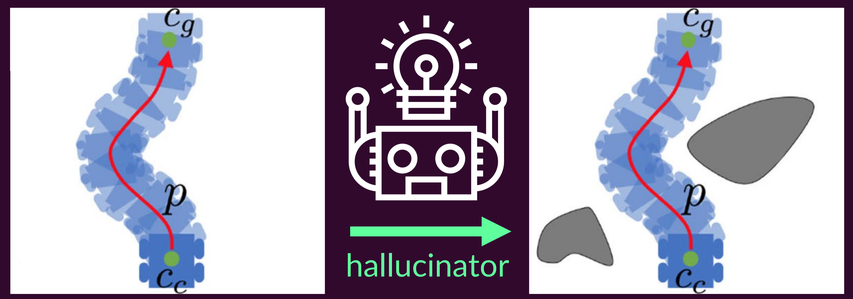
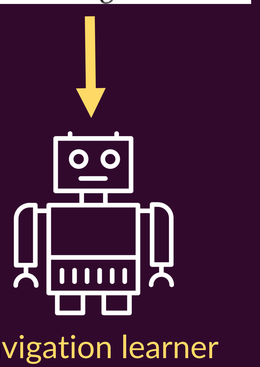
Generate Cheap Training Data for Navigation by Hallucinating Obstacles

suboptimal plan collected safely in open space

hallucinated obstacles makes the same plan optimal

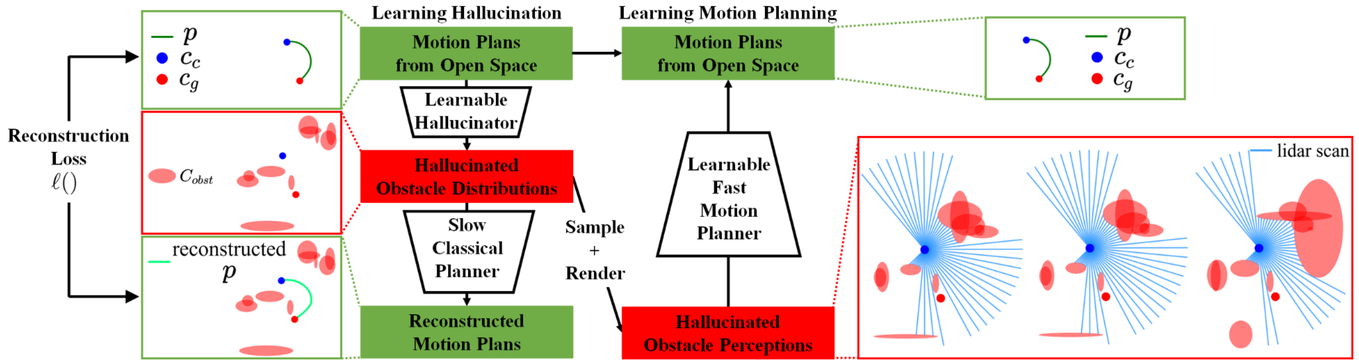




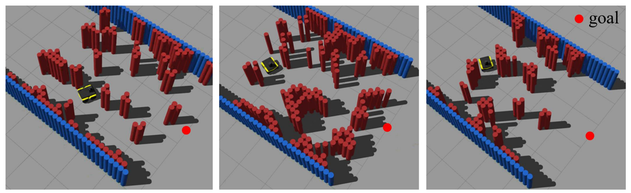
Method

Our algorithm learns how to hallucinate obstacles with self-supervised learning.

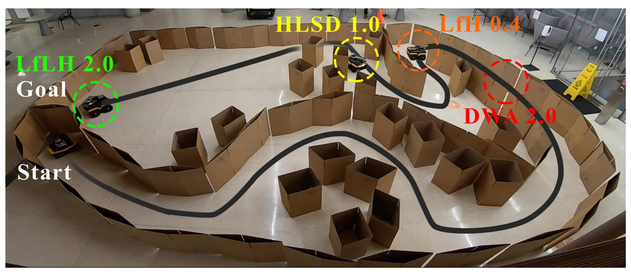
Robot learns how to navigate with cheap and safe hallucinated demonstrations.



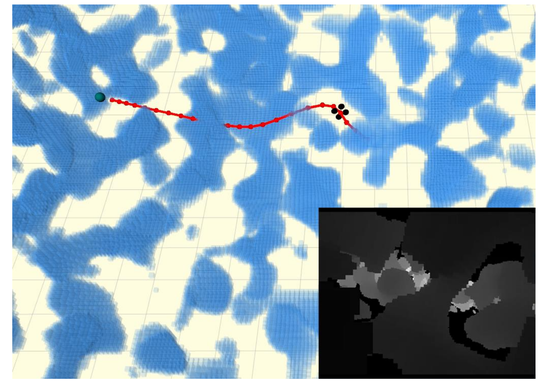
Our method **outperforms** previous hallucination techniques in 2D navigation.



DWA 2.0	Dataset	LfH	HLSD	**LfLH**
22.1±11.4s	0.4m/s	13.8±5.3s	13.2±7.9s	13.4±6.4s
	1.0m/s	∞	8.5±5.2s	8.3±3.8s
	2.0m/s	∞	∞	**8.1**±5.4s



Our method performs comparably with state-of-the-art 3D navigation planner.



Metrics	Ego-Planner	LfLH
Survival Time (s)	101.99±62.83	**192.87**±161.37
Survival Distance (m)	174.15±106.74	**213.07**±172.98
Path Optimality	**0.74**	0.56

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Learning from Learned Hallucination - From Agile Ground to Aerial Navigation

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