IEEE-CNSV

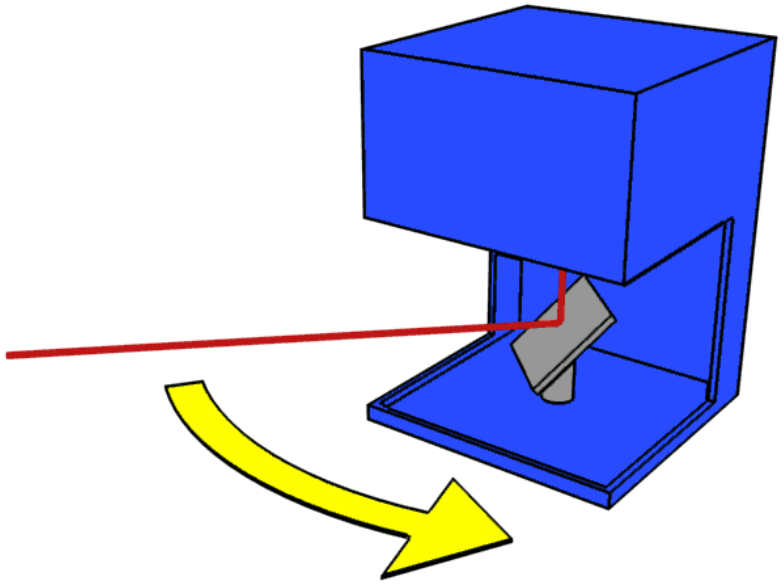
Consultants' Network of Silicon Valley

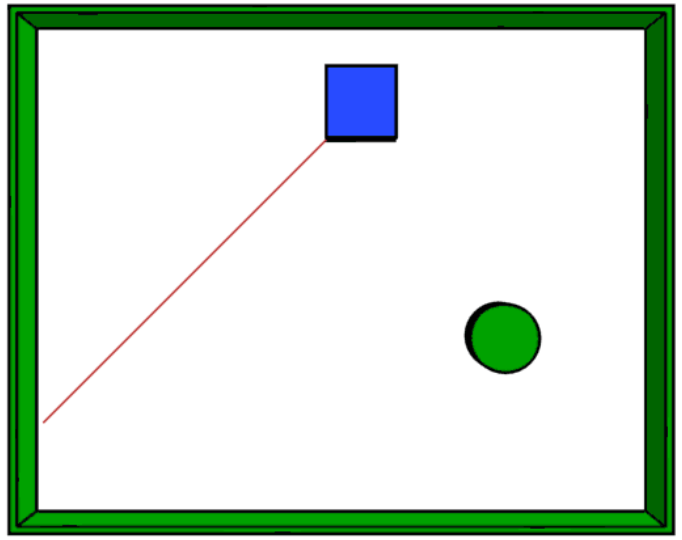
Multi-Lidar Architectures for Robust Autonomous Perception

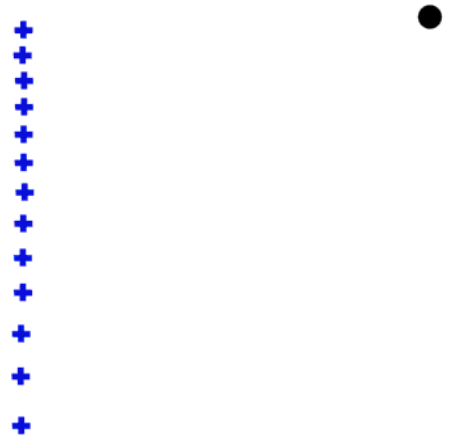
Aditya Srinivasan & Brian Pilnick

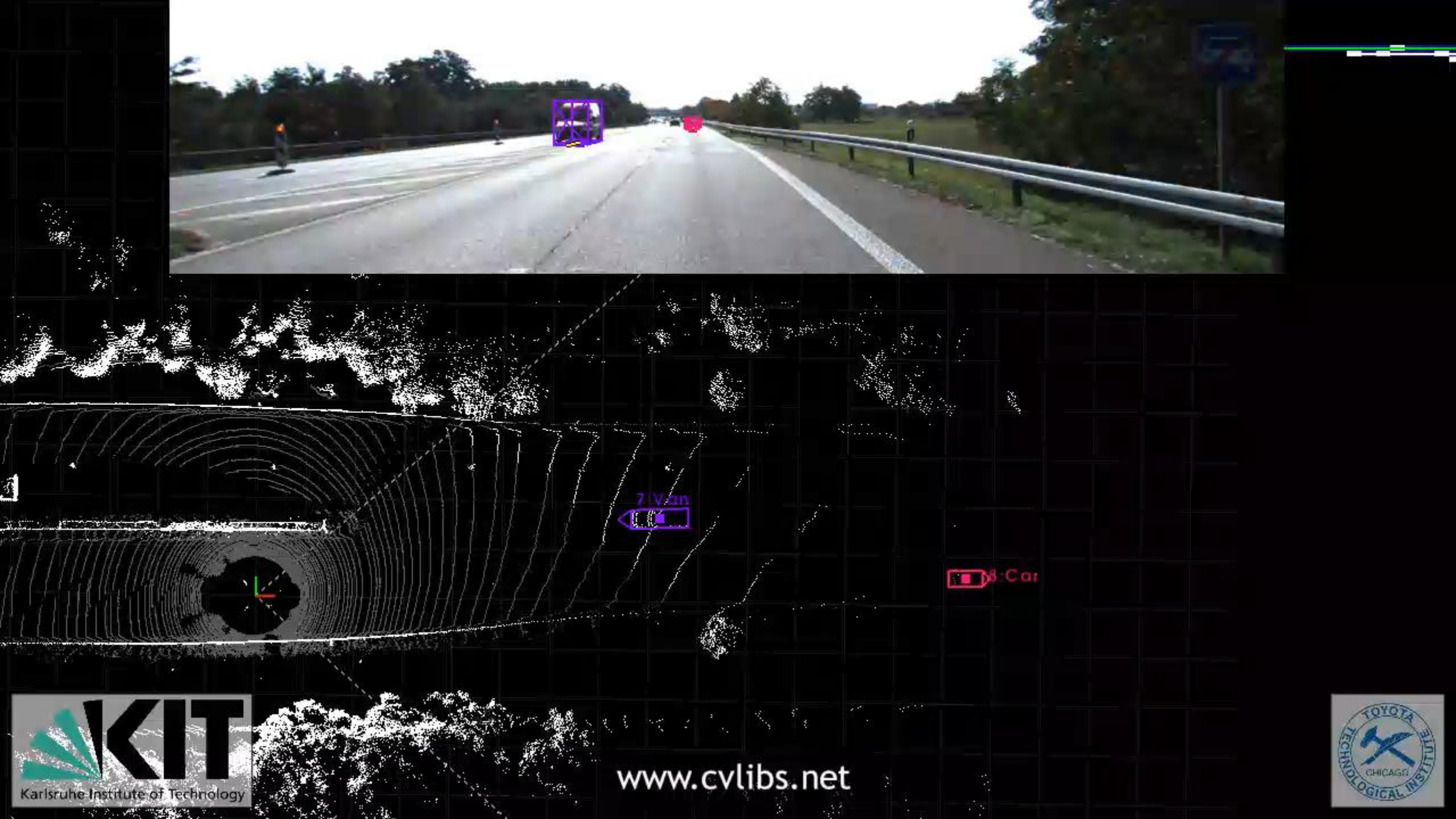
December 10, 2019

What is Lidar?









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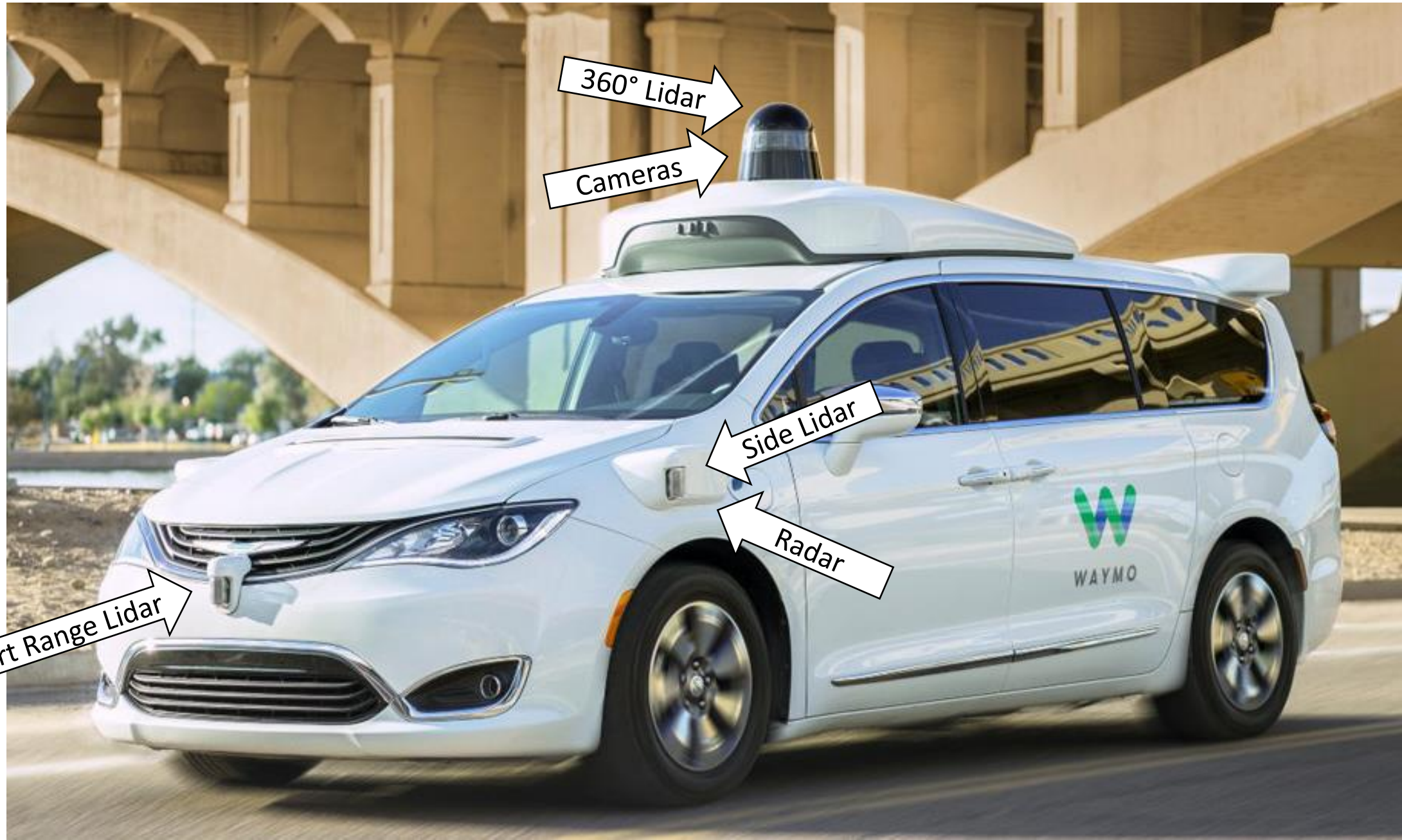
Waymo, 2019



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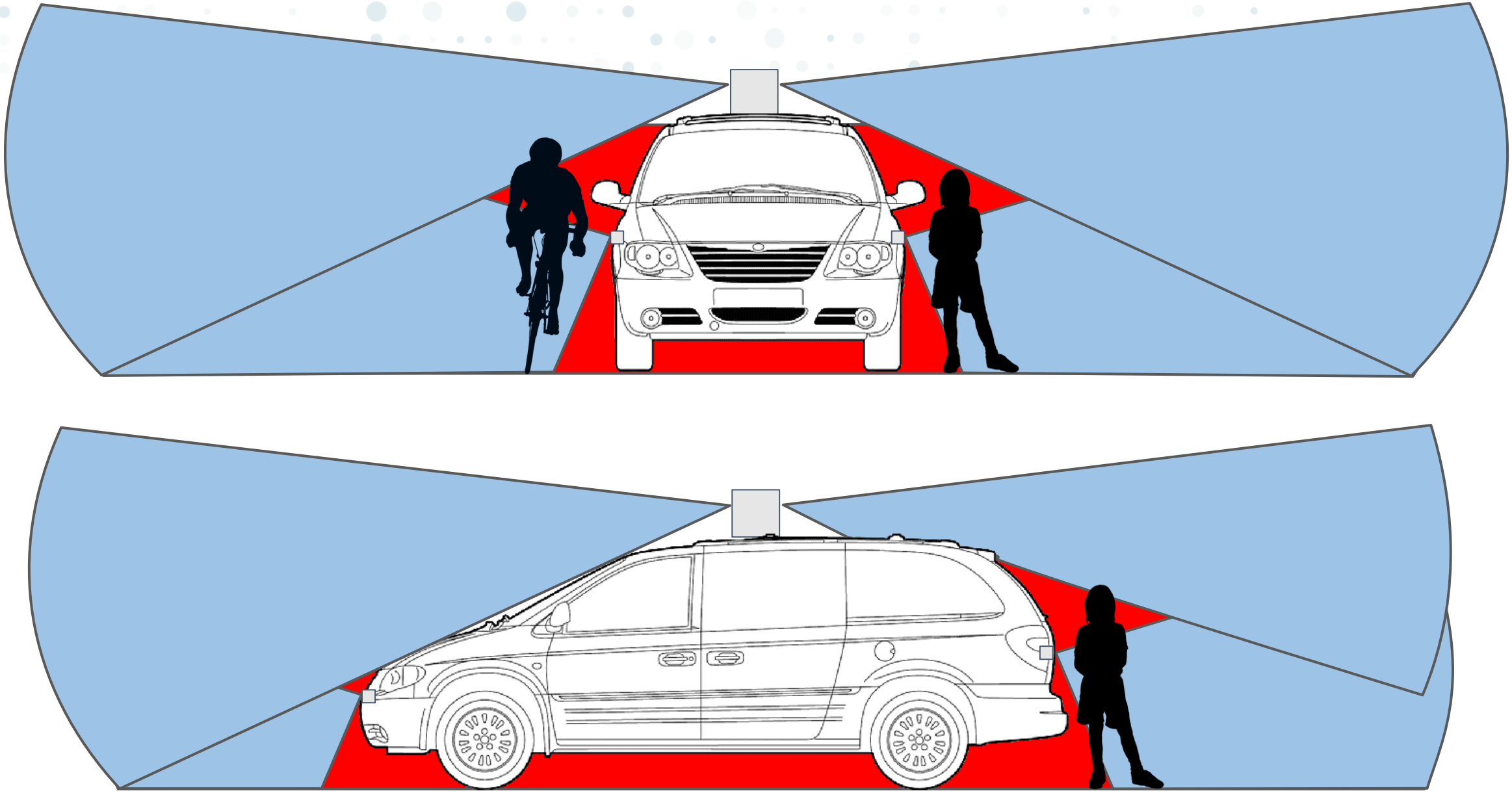

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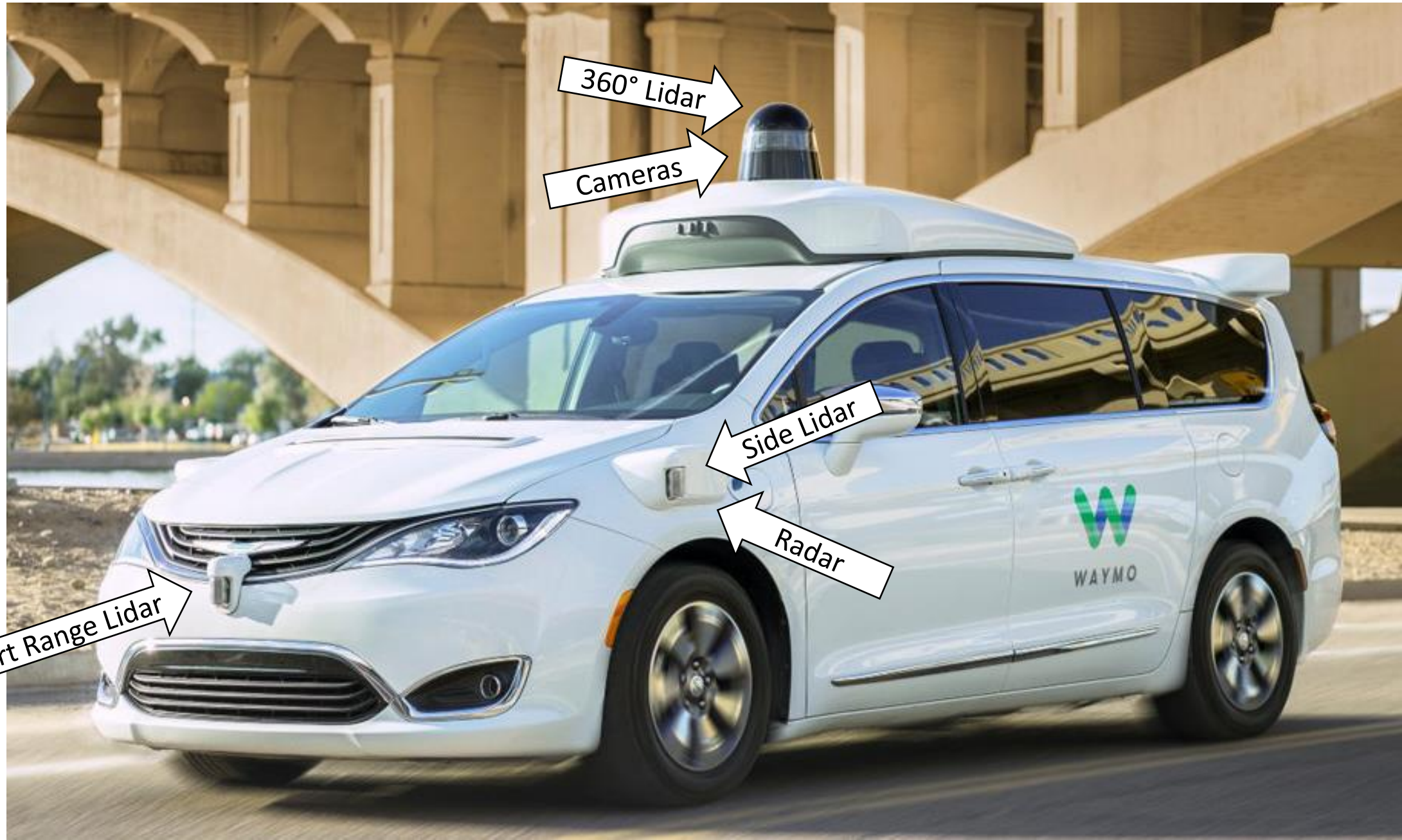
Waymo, 2019



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DARPA Urban Challenge, CMU 2007

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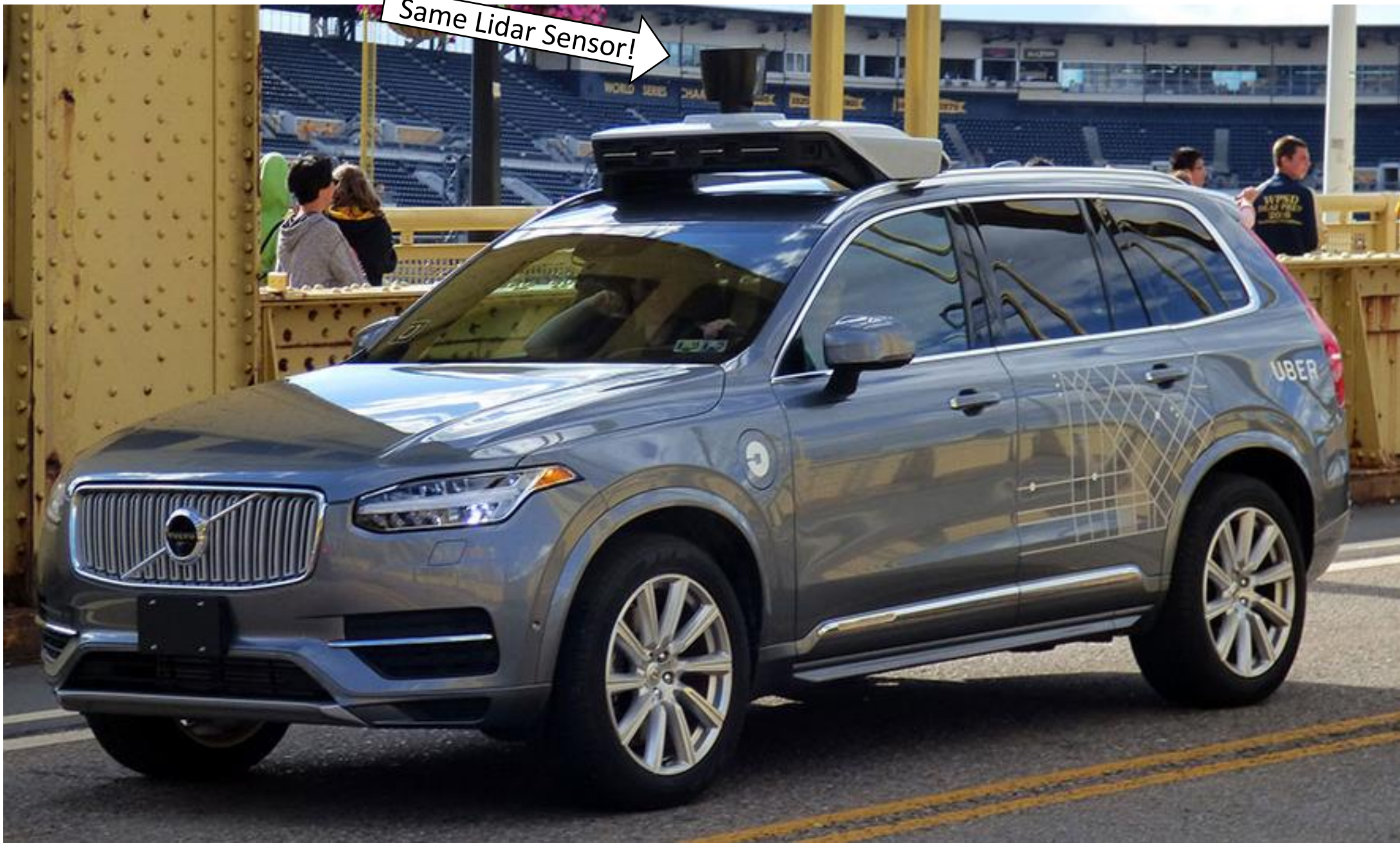
Uber ATG, 2019



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Sensors have evolved

	Velodyne HDL-64	InnovizOne	Improvement Factor
Max Range	Up to 120m	Up to 250m	2
Horizontal Field of View	360°	115°	0.3
Vertical Field of View	27°	25°	0.9
Vertical Resolution	0.4°	0.1°	4
Horizontal Resolution	0.16°	0.1°	1.6
Measurements per Second	1.1M	3M	3
Typical Power Consumption	60 W	20 W	3
Weight	12.7 kg (28 lbs)	0.5 kg (1.1 lbs)	25
Max Dimensions	215 x 215 x 283 mm	45 x 110 x 95 mm	25
Price	> $50k	< $2k	25
Beam Steering	Physically Spinning	MEMS Mirror	-
ISO 26262 Automotive Grade	No	ASIL B(D)	-

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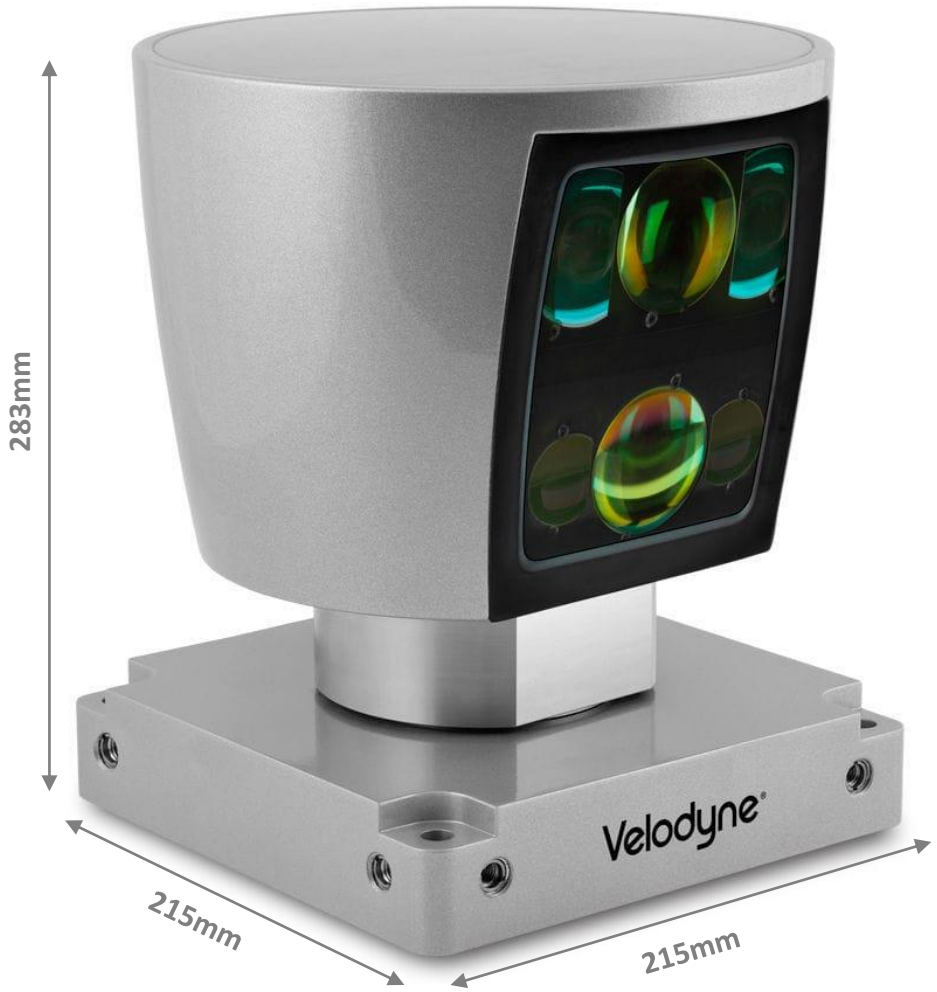
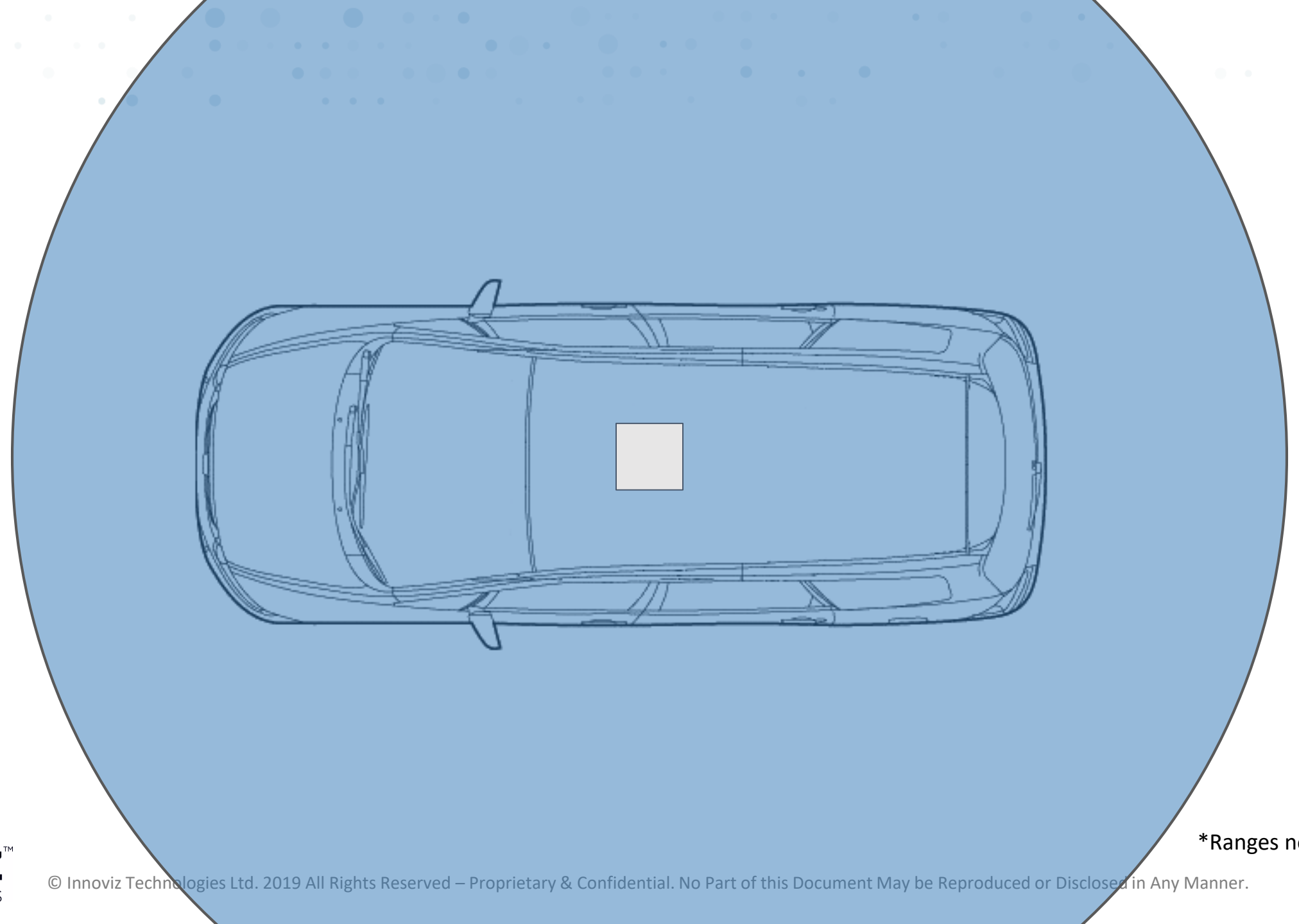


How do we take advantage of sensor evolution?

2007 **2019**



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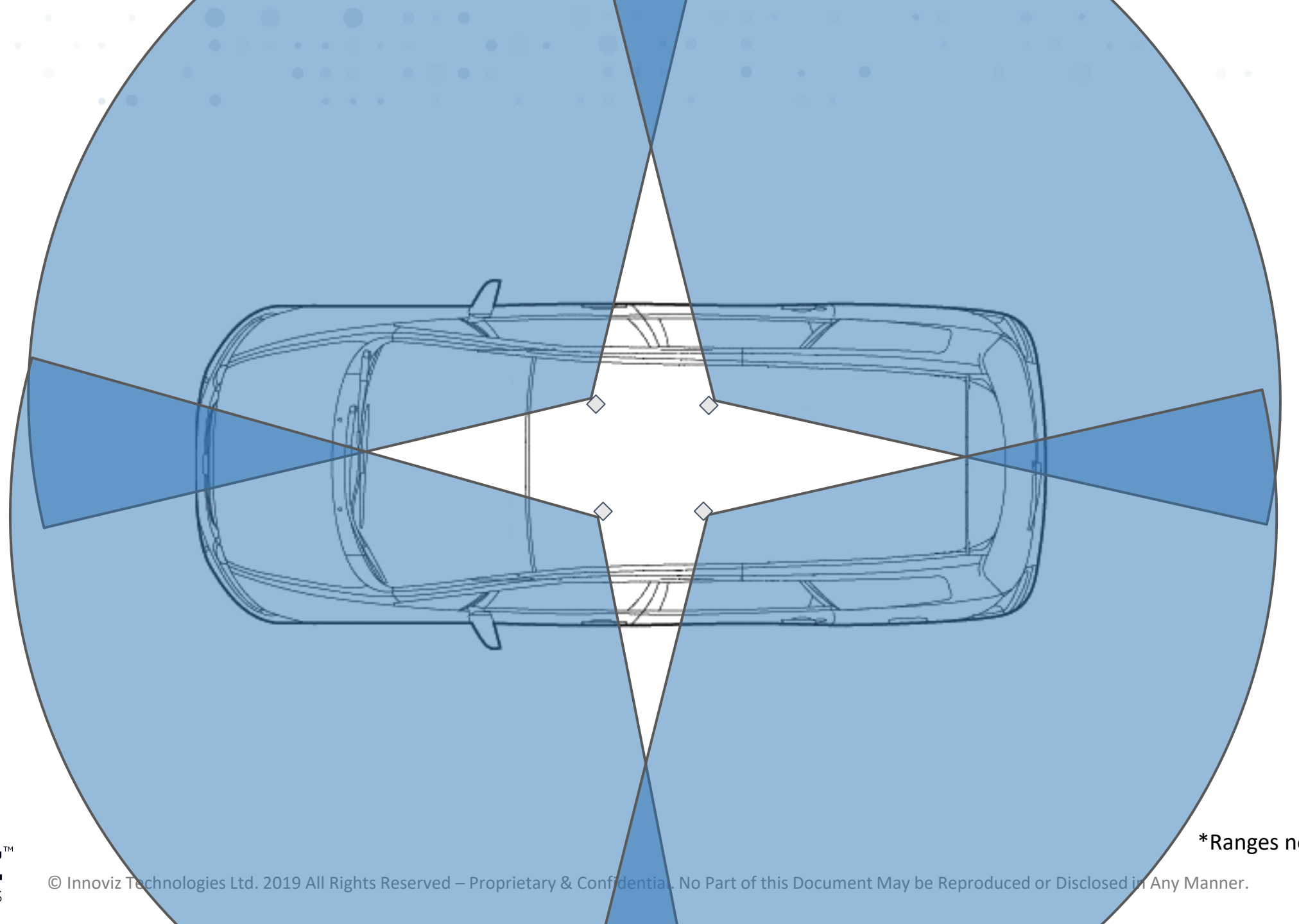

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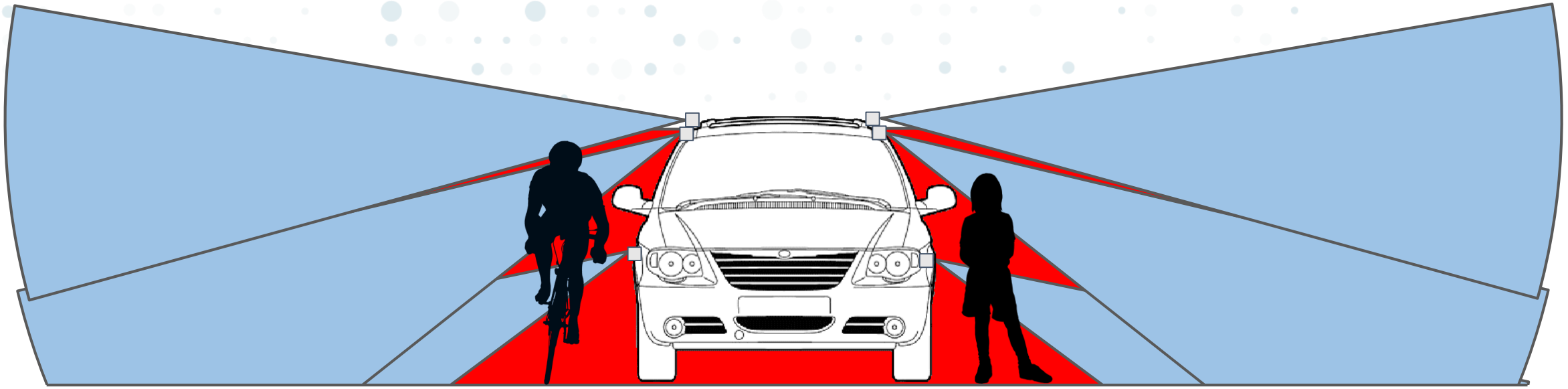

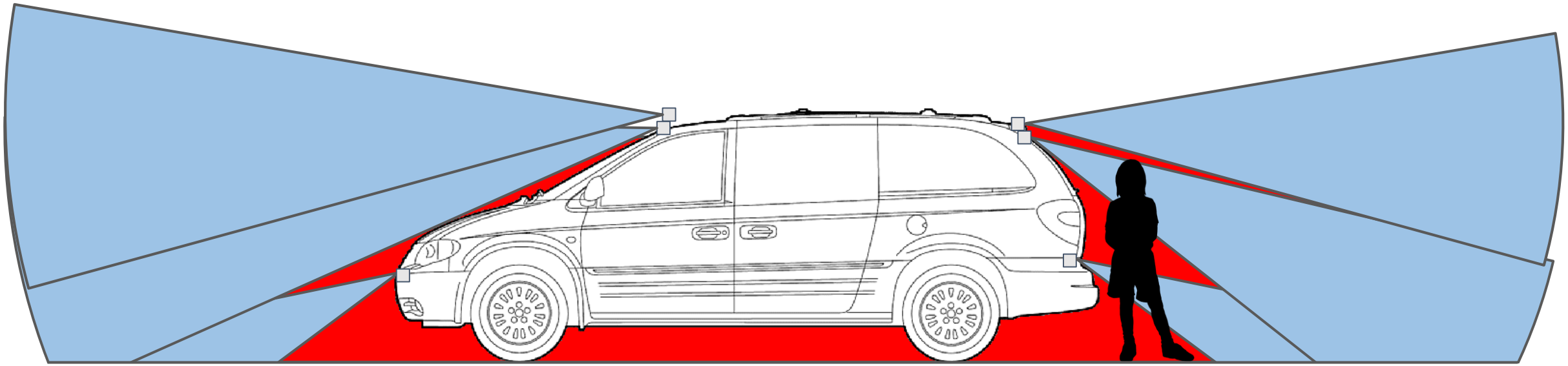

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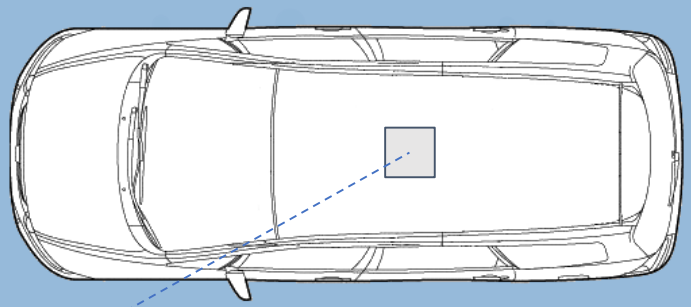

TRUCK

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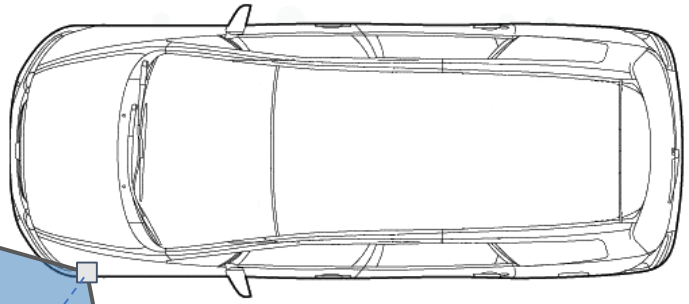

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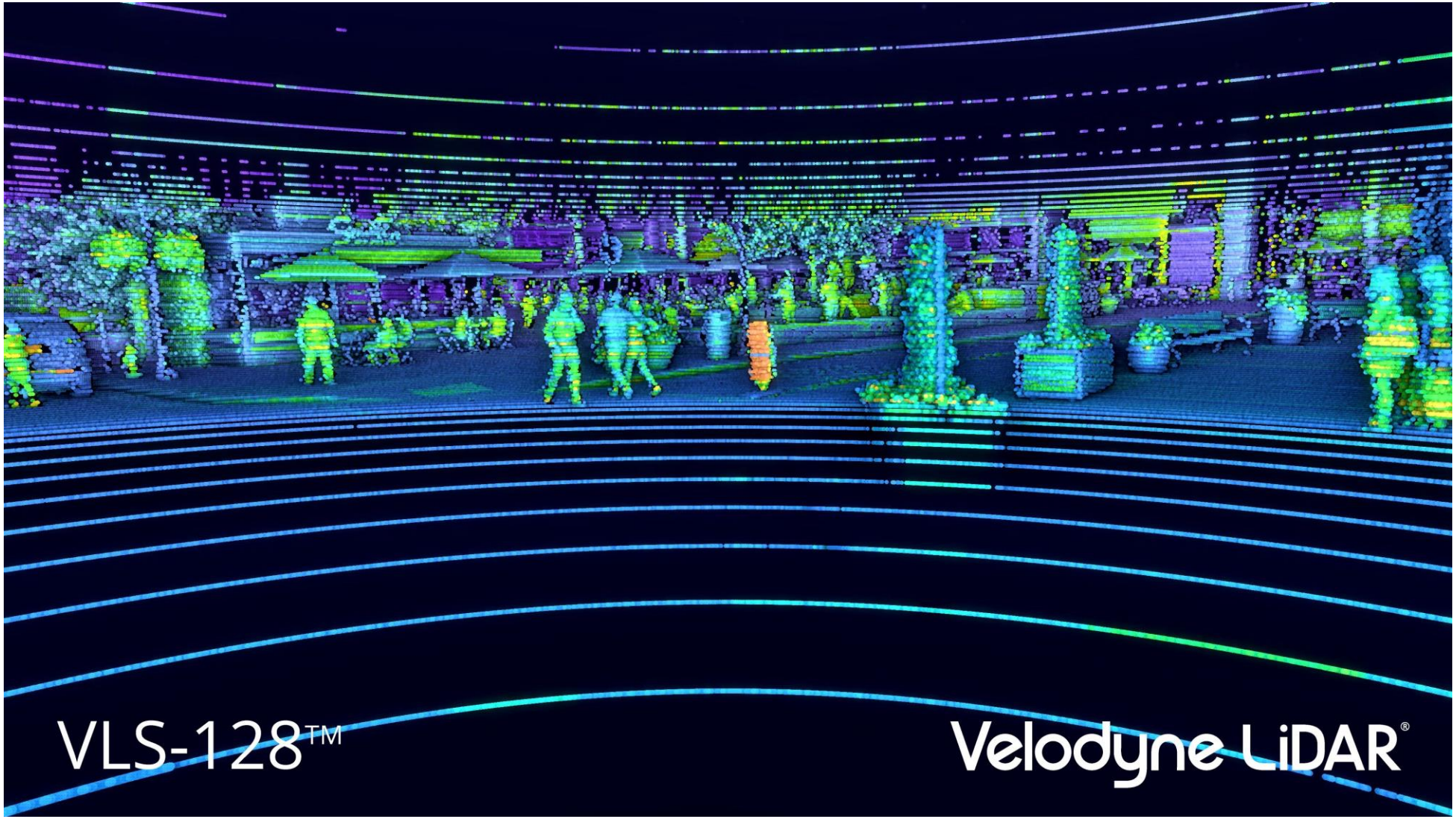

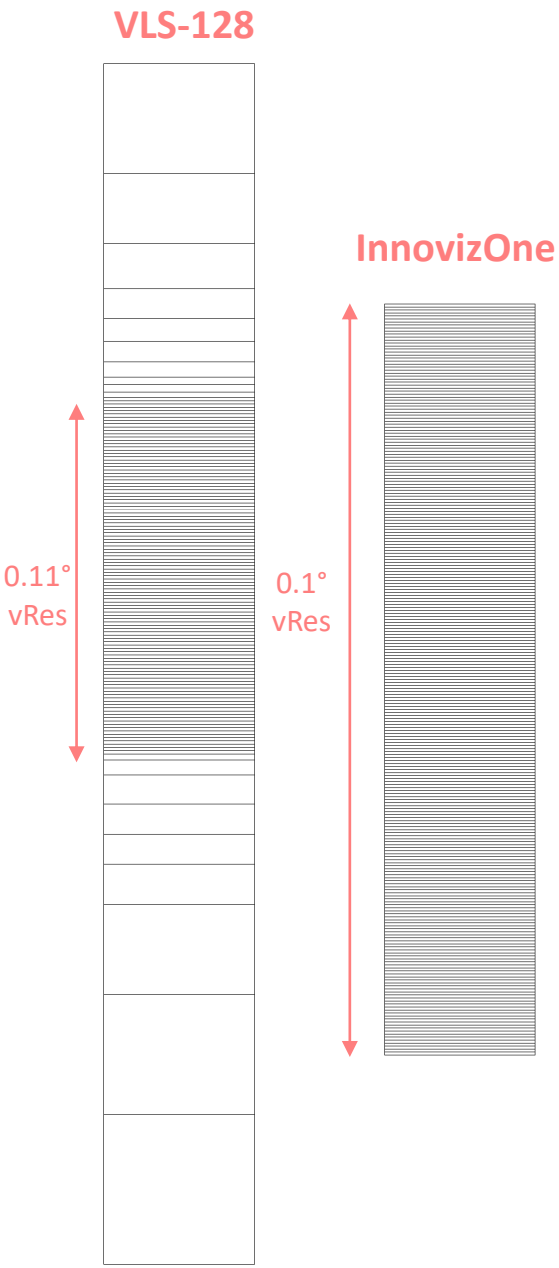

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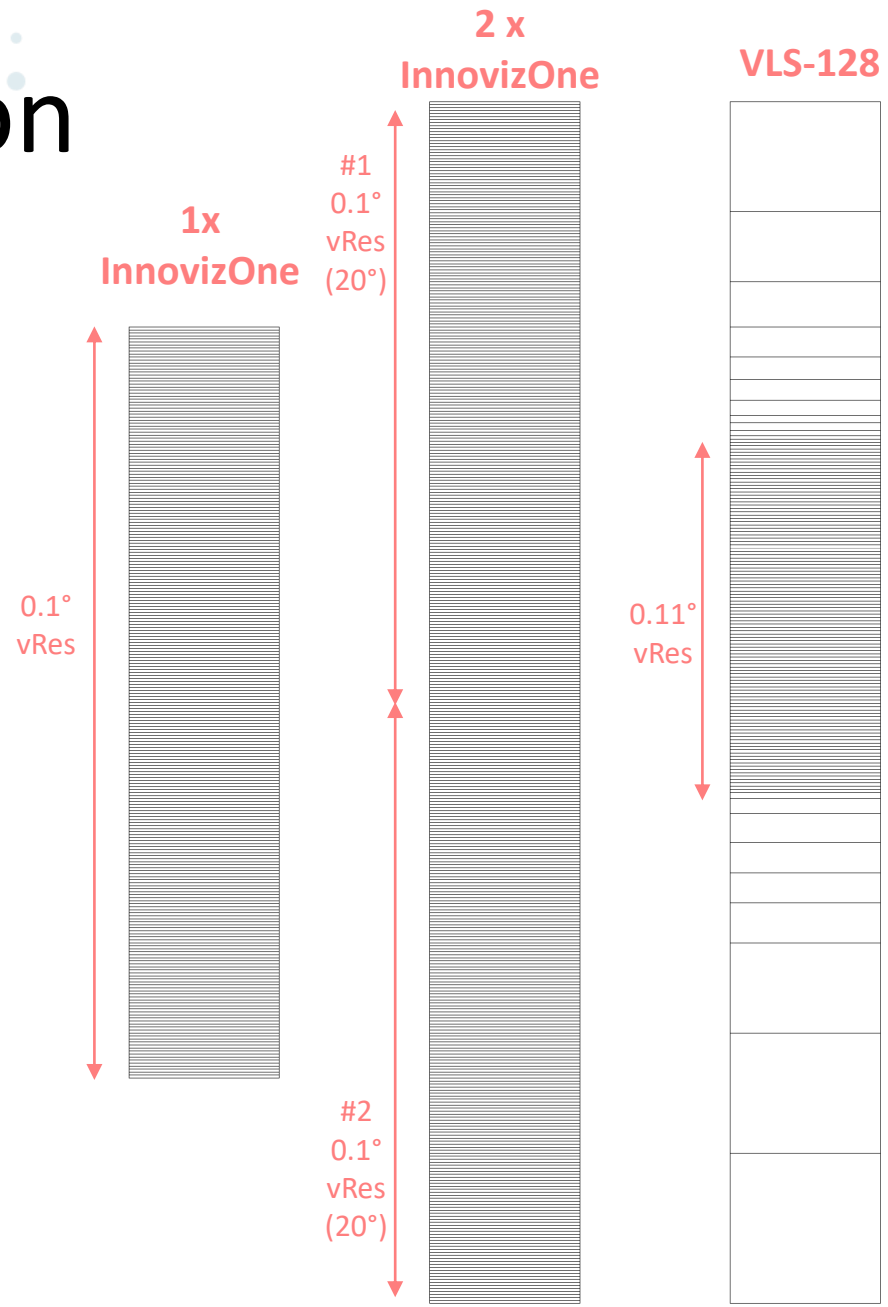
Configuration Flexibility



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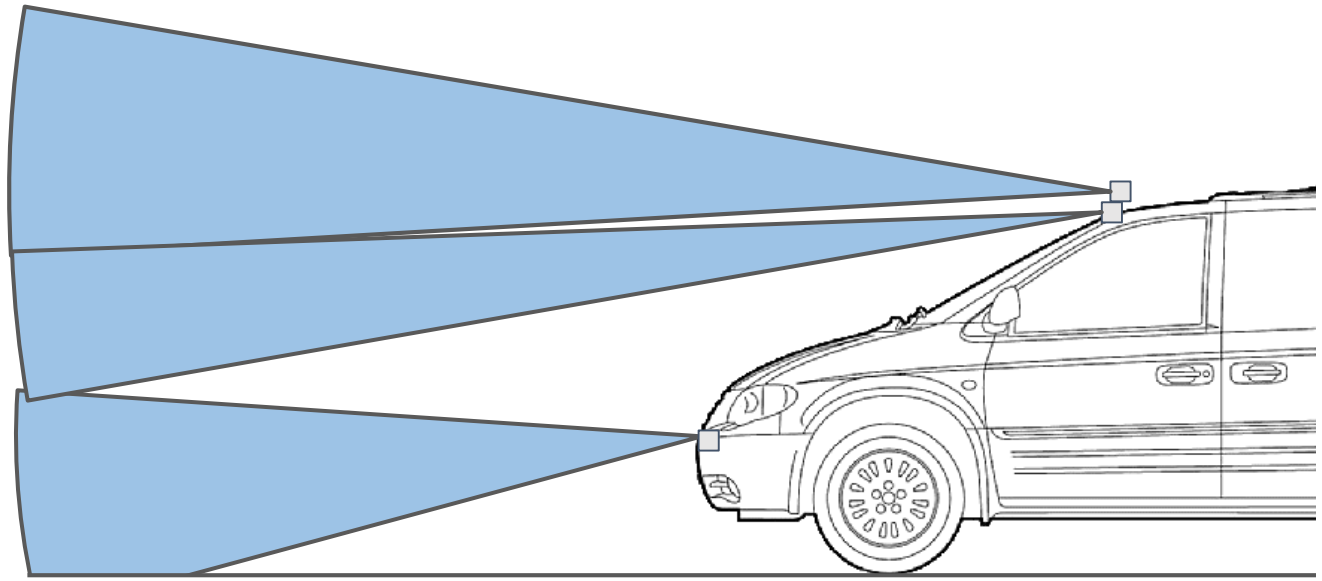
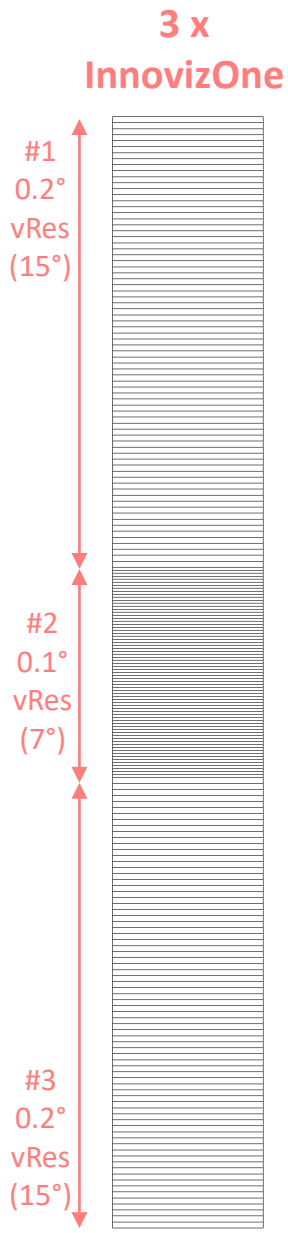
Fail Safe Redundancy





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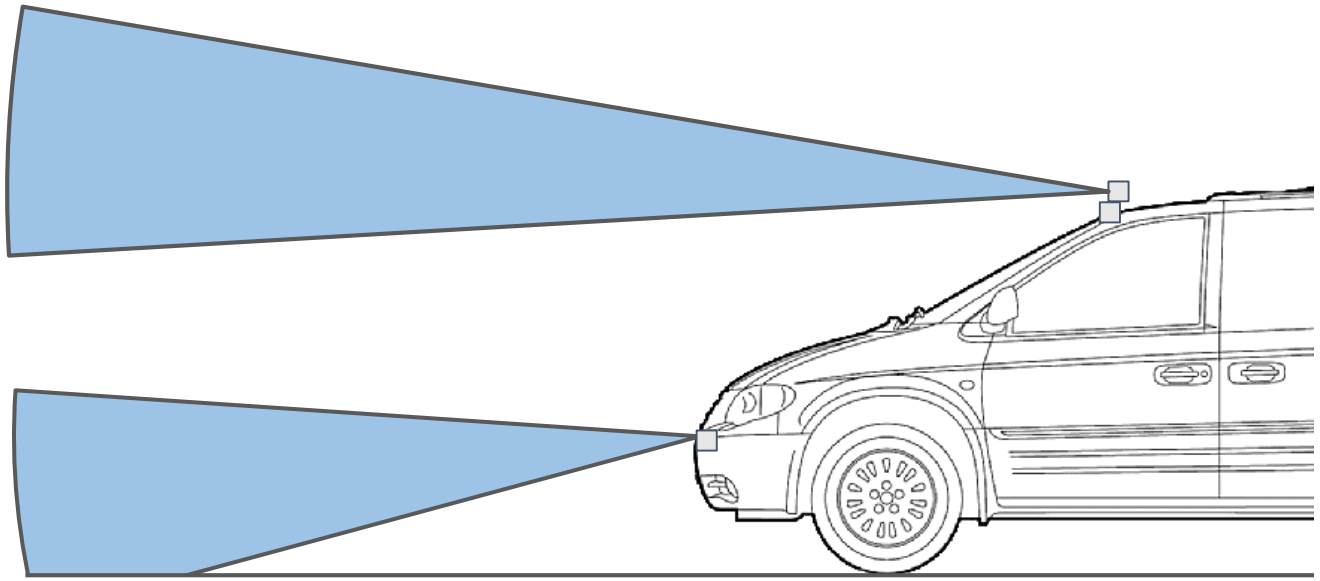

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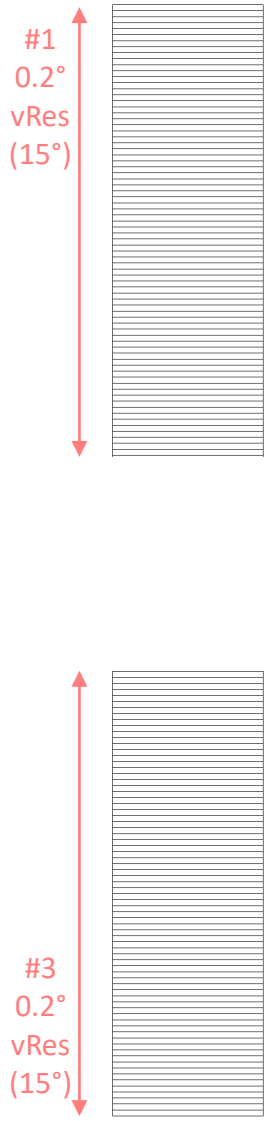

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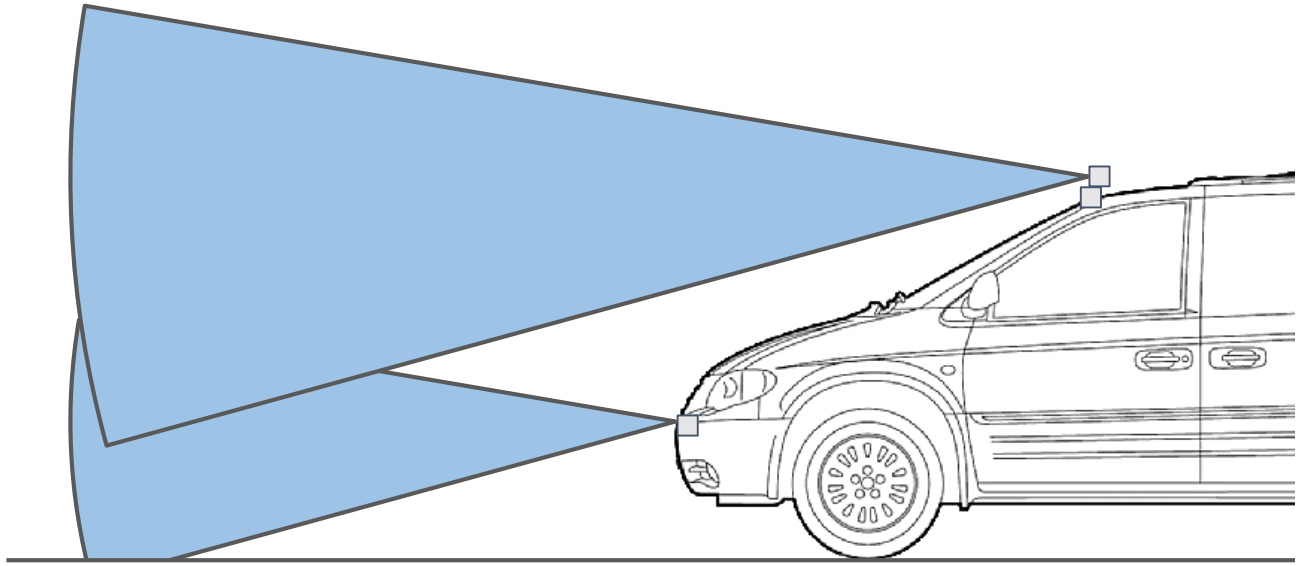

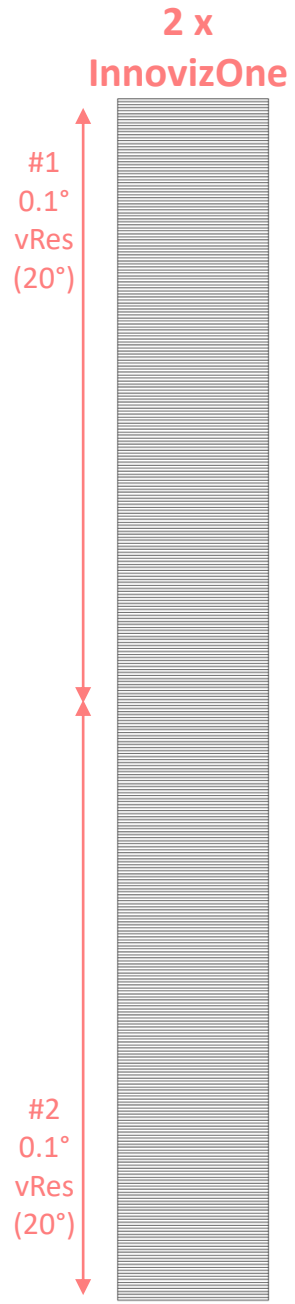

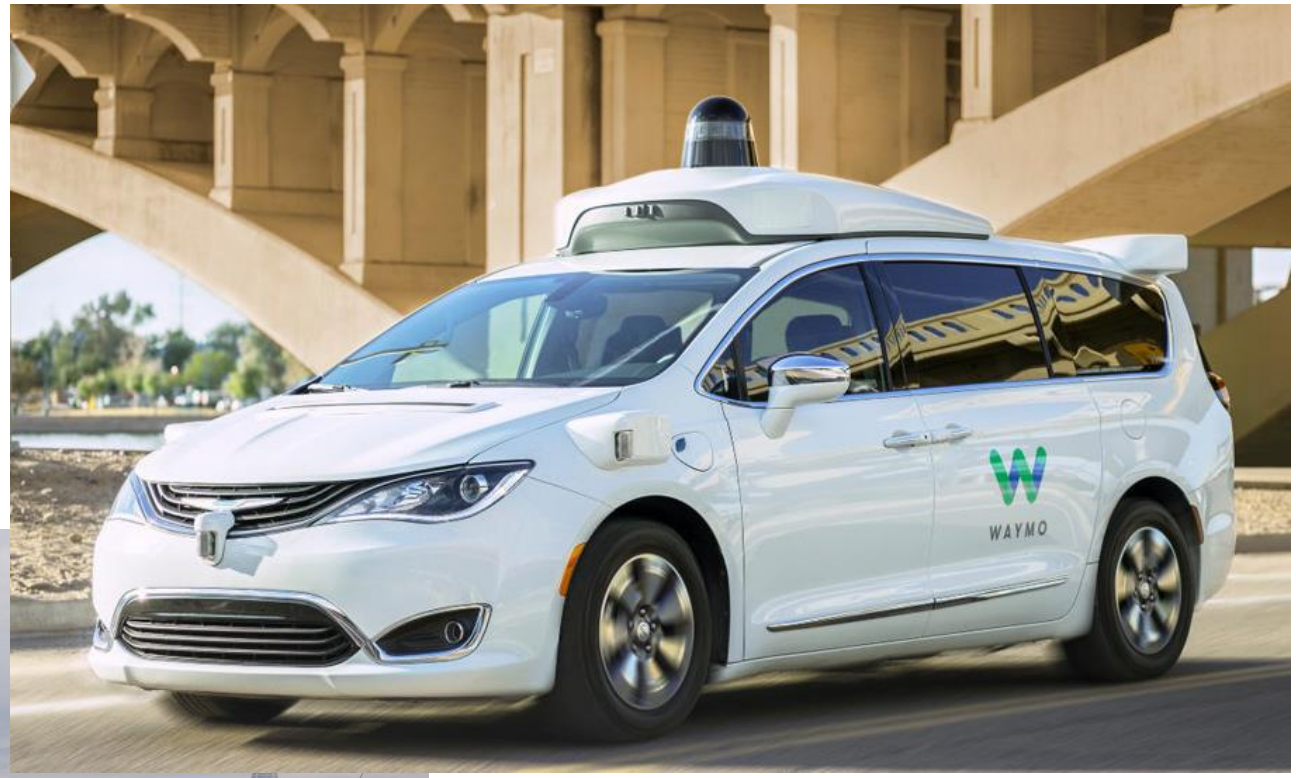

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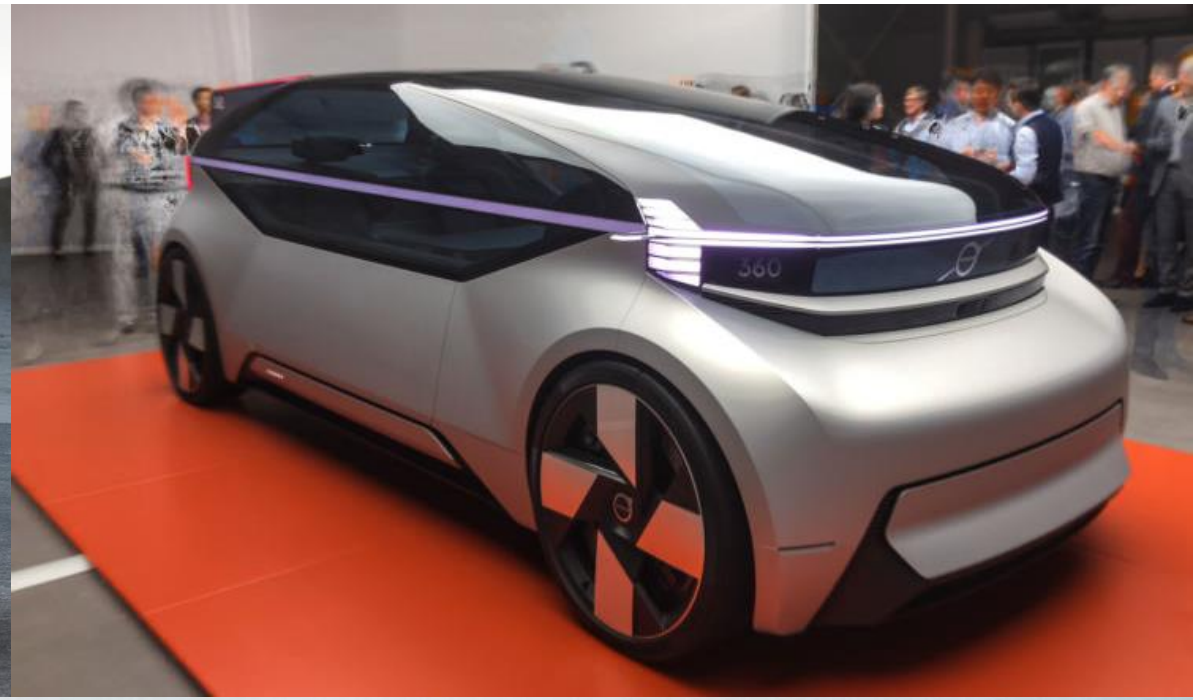

Thank You

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