研究报告

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Automated Vehicle Intelligent Vehicle

Autonomous Vehicle Self-driving Car Driverless Car

2014 Society of

Automotive Engineers International SAE International

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Level 0

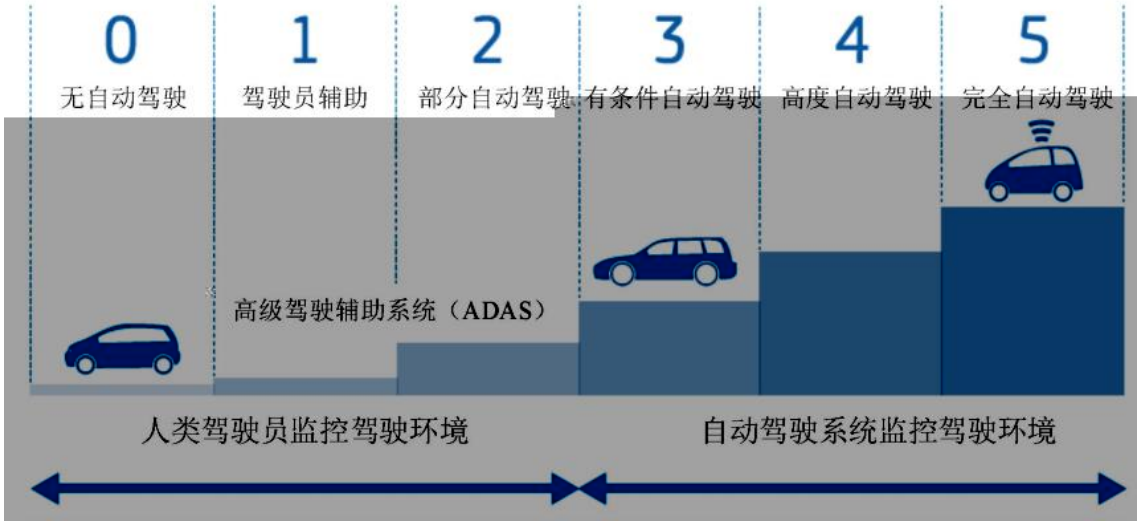
Level 1

Level 2

Level 3

Level 4

Level 5



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1984 Defense Advanced Research Projects Agency DARPA Autonomous Land Vehicle ALV DARPA 2004 —2007 3 DARPA [3] 1-1

1	2004 15 21 1 Sandstorm 11.78km
2	195 5 Stanley Sandstorm H1ghlander Kat-5 TerraMax Stanley 30.7km/h 6 53 58 200
3	2007 6 96 km 1 Boss 4 10 20 22.53km/h

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- NavLab-11 ˆ Wrangler
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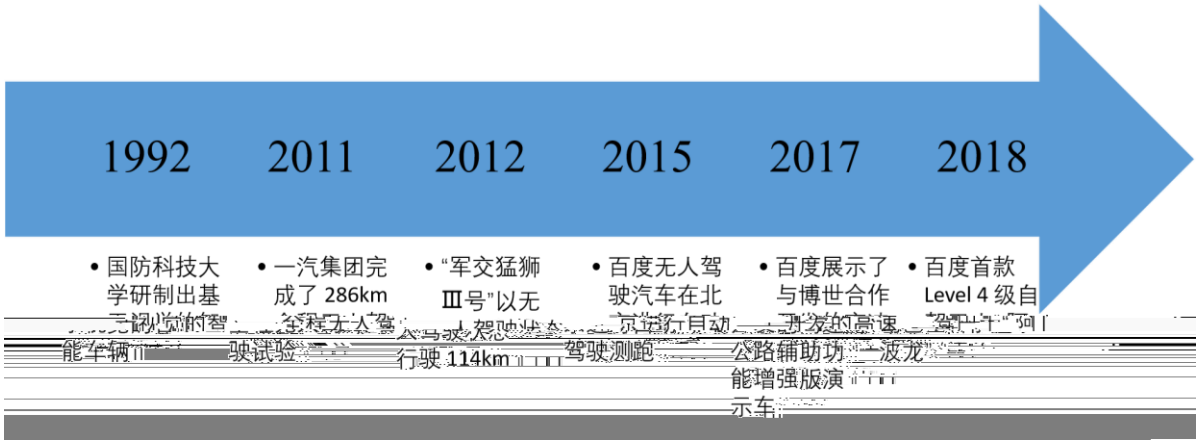
1992
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• 国防科技大学研制出基
• 一汽集团完成了 286km
• “军交猛狮Ⅲ号”以无
• 百度无人驾驶汽车在北
• 百度展示了与博世合作
• 百度首款 Level 4 级自
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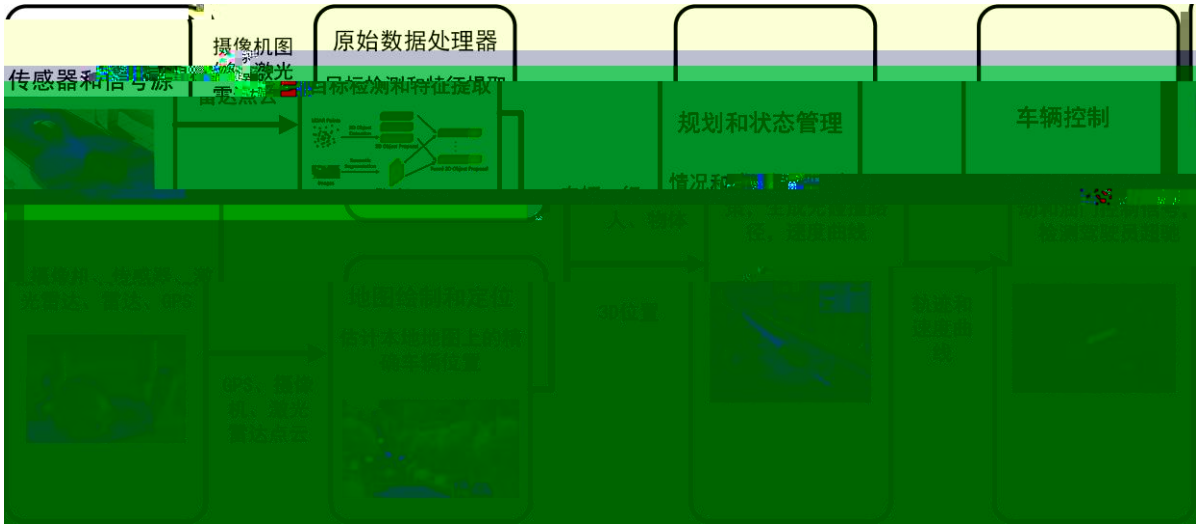

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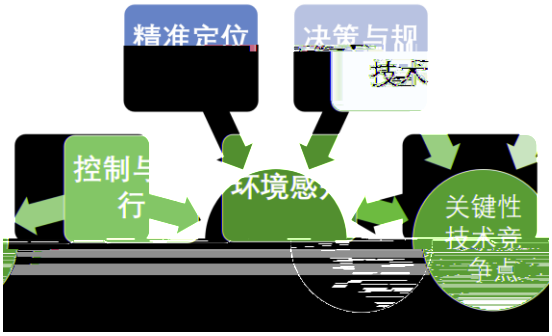
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Waymo				Waymo Waymo
Cruise				Waymo Cruise Waymo Cruise L5 Waymo 2020 Cruise Waymo

Mobileye		L2		Mobileye Mobileye L2 SuperVision 11 2 EyeQ5 L2+
				L2-L5 Constellation Drive OS Driveworks Drive AV Drive IX Xpilot
Luminar				1550nm 2022 Iris Sentinel
Apollo				2013 2015 Apollo Waymo L5
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Artificial Intelligence AI

Artificial Neural Network ANN

Autonomous Land Vehicle ALV

Convolutional Neural Network CNN

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Deep Learning DL

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Self-driving Autonomous vehicle, SdA

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Simultaneous Localization and Mapping بمغي

SLAM

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Waymo Cruise

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zhuysh@pbcsf.tsinghua.edu.cn