

# Fast Evolution of ADAS and ADS in Passenger Cars

Fan Ren | 03.15.2023

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## ADS is not ready in passenger car market, and will take a long time

### Automated vehicle will not be infallible

- infinite corner cases
- Measurement Uncertainty
- Unclear Rules
- Imcomplete requirement/ V&V
- etc.

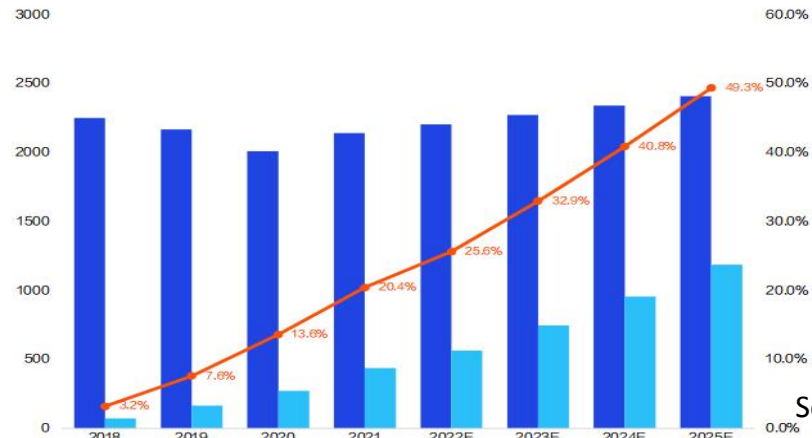
### Evolutionary Adoption of AD

- Low speed → High speed
- Commercial vehicles → passenger vehicles

### Consumers are less open to driving fully AD

- Trust in the safety/Test AD fuction themselves
- willing to pay
- More information from OEM
- More Regulations regarding AVs
- etc.

### Adoption rate of L2/L2+ ADAS grows fast

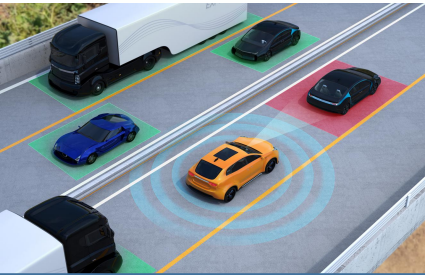


Sourced: Autohome

## OEMs pursue rich features

- ADAS advance from cruising to navigation based A-B chauffeur, expanding the ODD to provide more convenience and efficiency of mobility
- Pre-production L3/L4 system(designed to be) focus on low-speed scenarios

Pre-  
production  
L3/L4

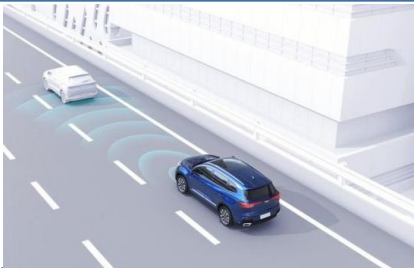


Traffic Jam Pilot  
(eyes-off,hands-off)

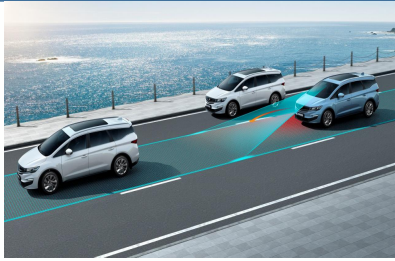


Automated Valet parking

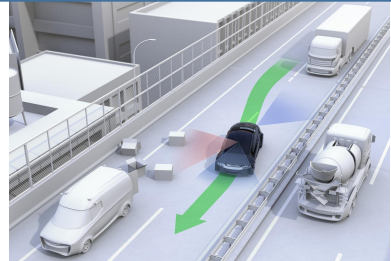
Driving  
Assistance



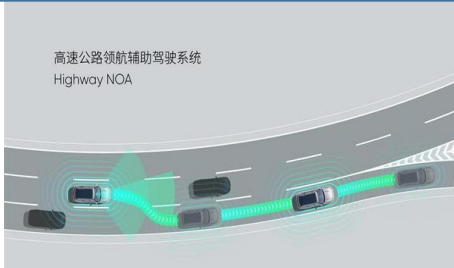
AEB/ACC



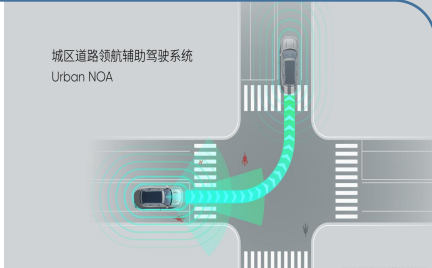
IACC/TJA



UDLC



Highway NOA



City NOA

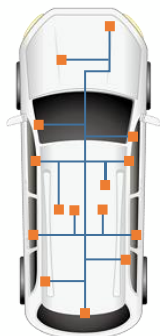
50% adoption rate

growing fast,  
standard configuration in some new car  
companies

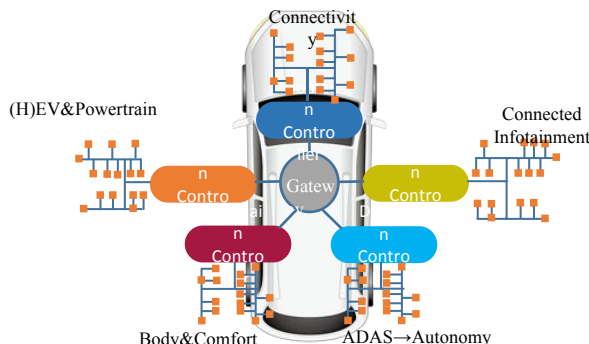
212,000,  
10+ Models,  
in 2022

2 models,  
in specific cities.  
in 2023

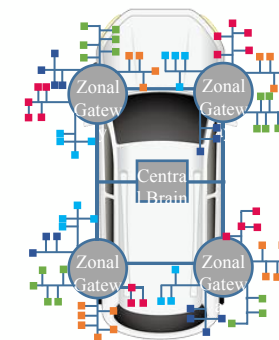
## Products become more integrated along with development of E/E architecture



Distributed E/E architecture

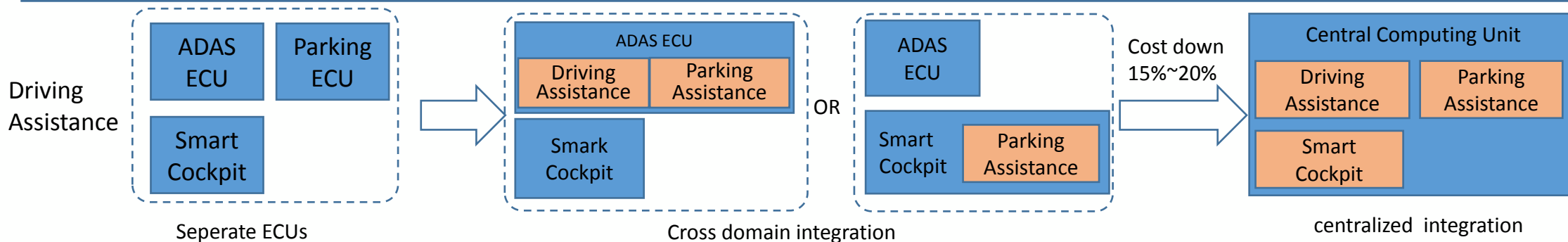


(Cross)Domain Centered E/E architecture

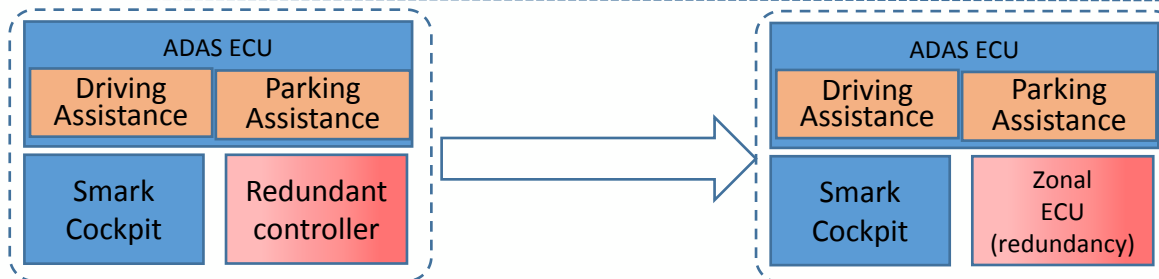


Centralized E/E architecture

Motivation: More Features/ Cost Down/ Complicated software and Hardware/ Fast iteration



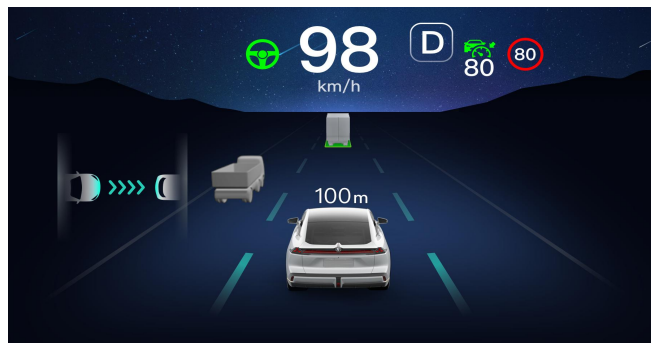
L3/L4  
AD



## Human-machine interaction become more informative and intuitive



Single-lane information



Multiple-lane information

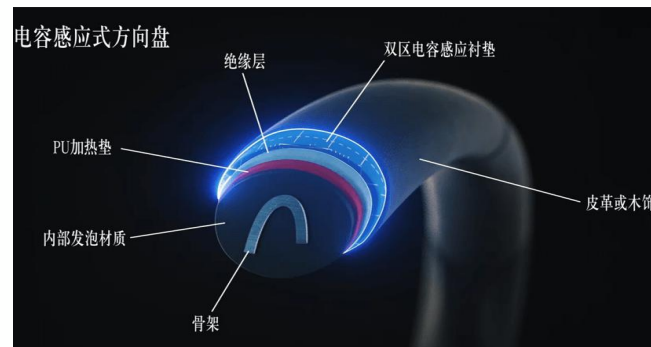


Surround Reality

- Make sure driver is in the loop(Ex: Driver Monitoring System, Hands-on detection)
- Redundant way to alert drivers(Ex: Vibrating seat belt, Vibrating seat)



Driver Monitoring System

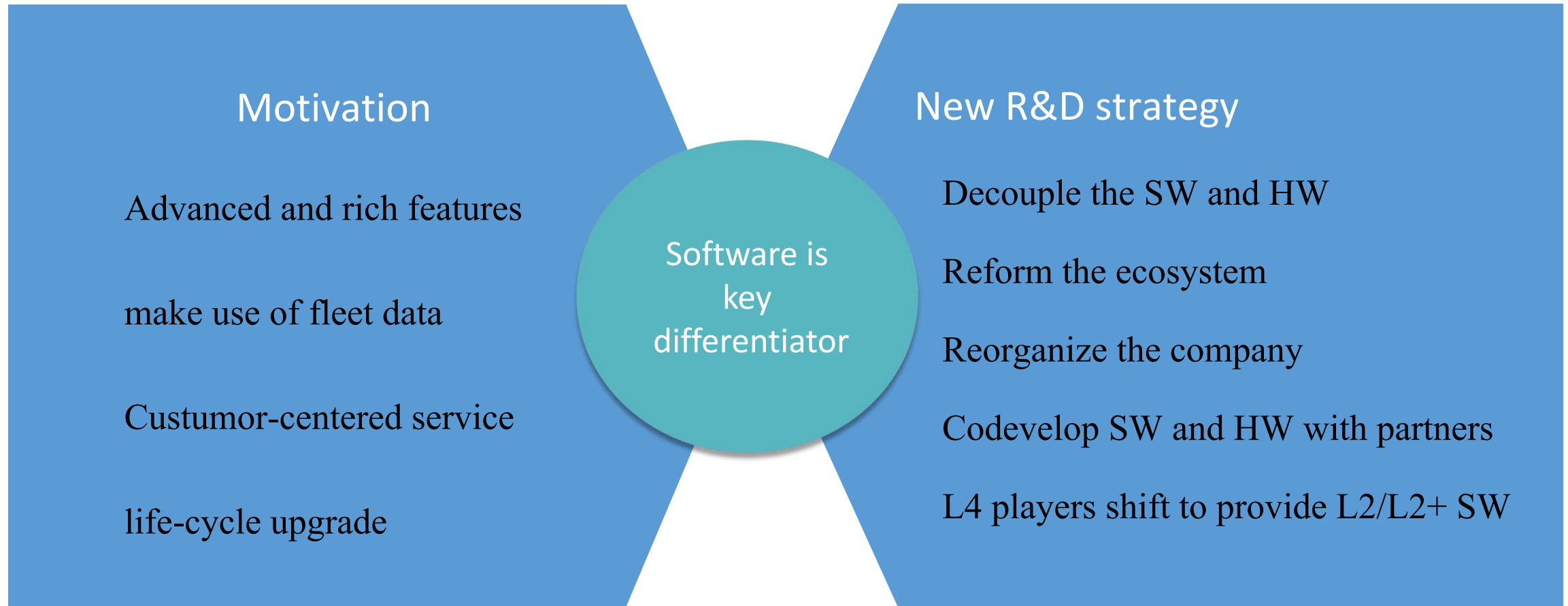


capacitive steering wheel

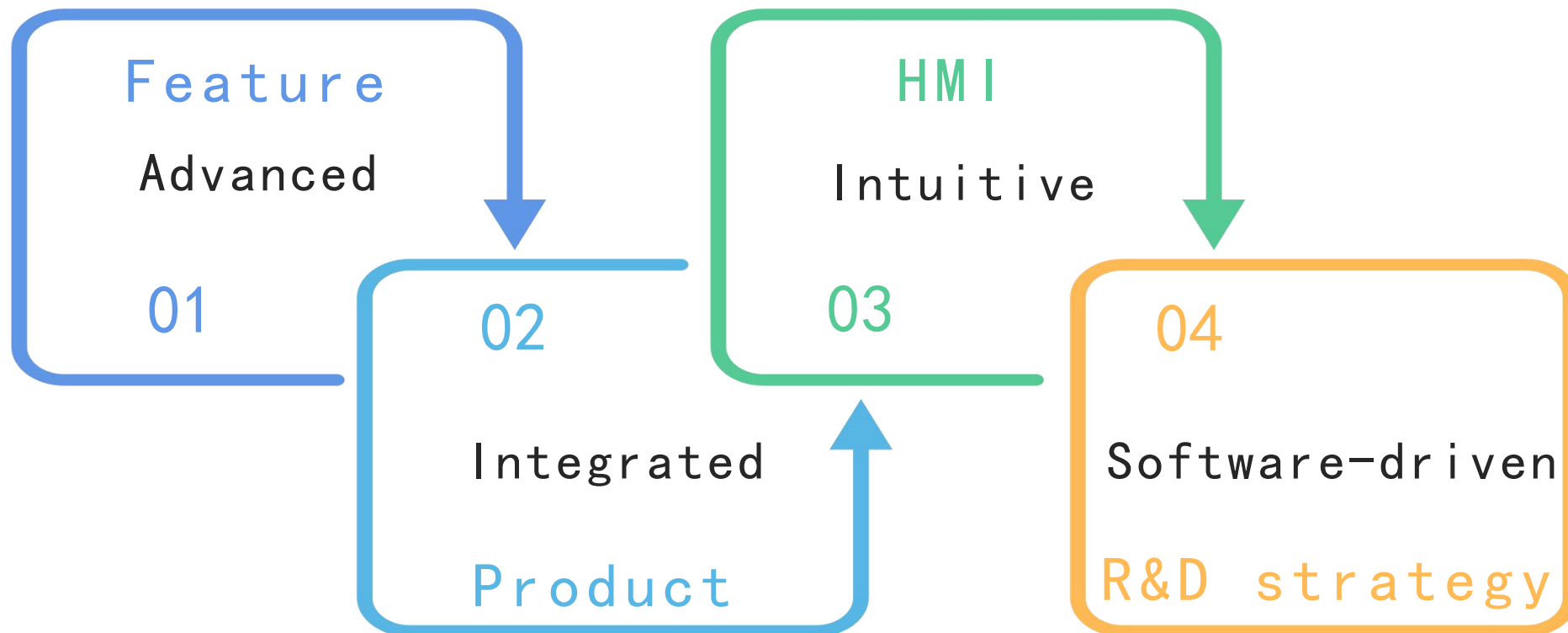


Vibrating seat belt

## New R&D strategy focus on software-driven development process



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