

## **CANGO Auto View: The unparalleled value of human-vehicle interaction**

SHANGHAI, July 9, 2021 /[PRNewswire](#)/ -- With the evolving landscape of the global automotive industry, Cango Inc. (NYSE: CANG) ("Cango" or the "Company") is issuing a bi-monthly industry insight called "CANGO Auto View" to bring readers, drivers and passengers up to speed with what's on offer in the automobile market, what trends are emerging, and what holes need to be plugged.

Below is an article from the Company's 3rd edition for February 2021.

Besides mobility, investors have their eyes on another market – one that is even more technology-driven – the onboard system and human-vehicle interaction. Distinct from the PC era and the mobile era, human-vehicle interaction in the auto context introduces disruptive changes. The reason smart vehicle operation is different from the immersion-style operation of a mobile system is that when the onboard system is in use during driving, 95% of the user's focus is on driving behavior and only about 5% of their energy and time can be spared to control the onboard system. Different scenarios will lead to dramatic changes in the information carrier – changing from text to voice, motion and other forms.

Statistics show that a user's sight and attention cannot be focused on the onboard system for more than three seconds. Within those three seconds, if the user fails at the operation or repeats the operation until the task is completed, the behavior is considered very dangerous and the cost of trial and error high. This, therefore, dictates that the functional logic and information layout of the onboard system be presented in the best way in the shortest time. The specific result achieved is that the design of human-vehicle interaction is closely aligned with user needs and interactive behavior rules in real scenarios so as to ensure that information transmission is extremely efficient.

In future, a large number of physical buttons will be replaced by other input methods, especially touch and voice methods. Touch control will improve accuracy, effective feedback mechanisms will be developed, and the application of gesture control will be expanded in middle-to-high-end models. In the meanwhile, because of its convenience and humanization, voice control will become the main interactive method with the advancement of AI technology. And biometric technology will be applied and developed in areas such as fatigue monitoring and eyeball tracking.

Take the voice system for example. At present, human-vehicle interaction is achieved through two types of technology: a speech recognition system and a natural language processing system.

A speech recognition system is mainly used to recognize, distinguish and verify the voice of each speaker, and the representative company is Baidu. With an accuracy rate of 98%, its system has reached a near-mature stage, enabling a voice interaction that can support different languages and dialects.

Natural language processing system, on the other hand, automatically understands human languages and approaches human thinking modes. The representative company is iFLYTEK with an accuracy rate of 70% and room for breakthroughs.

As for facial and gesture recognition system for vehicle owners, it mainly uses computer visual technology to extract facial and graphic information from images. The representative company is SenseTime with an accuracy rate of 99% and capability of delivering near-mature products.

Internet technology giants such as BAT and Huawei are the major providers of the aforementioned applications, while iFLYTEK, SenseTime, AISpeech and Yitu are active players in the AI application field, each with its own strengths. iFLYTEK went IPO more than one decade ago, while SenseTime, Yitu and AISpeech are inching infinitely closer to IPO.

### **Onboard infotainment**

The smart devices and software services "hidden" inside smart vehicles have been attracting serious investment over recent years. At present, the most obvious consumer-related functions smart vehicles are capable of cover five main areas: navigation and positioning, multimedia, vehicle services, consumption and payment, and communication and social networking.

Navigation and positioning at present mainly encompasses synchronous precise positioning, real-time road conditions, best route, 3D route guidance, 3D navigation and precise map navigation.

The second area is multimedia. At present, it mainly encompasses radio, audio playback, video playback, mobile TV, electronic photo album, life information inquiry and games.

The third area is vehicle services. At present, it mainly encompasses surveillance and anti-theft, call service, road assistance, remote diagnosis, assisted driving, vehicle insurance, and seat and air conditioning control.

The fourth area is consumption and payment. At present, it mainly encompasses smart fueling, in-car payment, multiple payment platform, shopping and consumption, movie ticket purchase, food takeout and flight tickets.

Currently, platform-level companies are still emerging in this area. Taking into consideration license payment and other factors, this type of services should mainly be provided by the emerging carmakers and mobile payment giants.

And the fifth area is multimedia. At present, it mainly encompasses Bluetooth communication, mobile wireless network, onboard SMS, email, onboard WeChat and mobile office.

The emerging carmakers have taken the lead in this area, developing APPs capable of vehicle owner authentication and providing socializing platforms for both insiders and strangers. It remains to be seen whether internet giants Tencent and Alibaba can take over socializing in an auto scenario by catering to different scenarios.

### **Onboard camera and radar**

In addition to onboard software, smart vehicles are undergoing tremendous changes in hardware due to the widespread use of driverless technology, and these changes have bred a large number of investment opportunities.

For example, for a smart vehicle in the driving mode, its judgment logic is similar to that of a person walking. The eyes first detect obstacles and routes, then the brain makes analyses and decisions on whether to avoid the obstacles or to go straight. The eyes of a smart vehicle mainly consist of cameras, LiDARs, high-precision maps and GPS positioning. And sensing devices including cameras and radars are mainly responsible for collecting information around the body of the vehicle and determining the location of the vehicle.

At present, Tesla has a relatively comprehensive understanding of sensor systems smart vehicles should be equipped with, while the emerging carmakers in China have been lingering in the learning mode for a long while. Based on what Musk has been saying in public, no big changes will be made to Tesla's onboard sensors in the future. Public information shows that as a standard, Tesla vehicles are equipped with eight cameras, one millimeter-wave radar and twelve ultrasonic radars.

Up till now, the emerging carmakers in China have mostly adopted Tesla's plan. However, information from the official channels of various platforms has pointed at LiDAR being used by multiple auto brands in the future. Xpeng, in fact, has claimed that it will achieve self driving through the fusion method of camera + millimeter-wave radar + ultrasonic radar + LiDAR.

During the 2020 Guangzhou Auto Show, Wang Jun, President of Huawei's Smart Vehicle Solutions BU, said in a media interview that Huawei's LiDAR has become a hot product snapped up by auto companies and that Huawei was considering a release in the near future of its entire array of LiDAR products. At the same time, Huawei revealed through public channels that it is conducting LiDAR studies, hoping to not only enhance LiDAR accuracy but reduce the price to below 200 US dollars.

In other words, accuracy improvement and cost reduction of various radars are highly likely to add crucial competition barriers for the branding of the emerging carmakers.

Due to its unique industry characteristics, the sensor field hasn't triggered wide-ranging discussions in the venture capital field. The main reasons are as follows: One, sensor manufacturers have limited capacities for growth and the return on investment rate is not as high as that of the internet industry. Two, currently there are not many fields requiring sensor applications. And three, R&D teams under OEMs have multiple advantages in terms of team, time and capital.

Nonetheless, the advent of the smart manufacturing era is bound to boost the use of sensors in smart vehicles and other fields, and their market potential is huge indeed.

### **About Cango Inc.**

Cango Inc. (NYSE: CANG) is a leading automotive transaction service platform in China connecting dealers, financial institutions, car buyers, and other industry participants. Founded in 2010 by a group of pioneers in China's automotive finance industry, the Company is headquartered in Shanghai and engages car buyers through a nationwide dealer network. The Company's services primarily consist of automotive financing facilitation, car trading transactions, and after-market services facilitation. By utilizing its competitive

advantages in technology, data insights, and cloud-based infrastructure, Cango is able to connect its platform participants while bringing them a premium user experience. Cango's platform model puts it in a unique position to add value for its platform participants and business partners as the automotive and mobility markets in China continue to grow and evolve. For more information, please visit: [www.cangoonline.com](http://www.cangoonline.com).

**Media Contact:**

Juliet Ye  
Cango Inc.  
Tel: +86 21 3183 5088 ext.5581  
Email: [pr@cangoonline.com](mailto:pr@cangoonline.com)  
Twitter: [https://twitter.com/Cango\\_Group](https://twitter.com/Cango_Group)

SOURCE Cango Inc.

---

<https://ir.cangoonline.com/2021-07-09-CANGO-Auto-View-The-unparalleled-value-of-human-vehicle-interaction>