Automotive Cockpit SoC Technology and Application Research Report, 2020

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STUDY GOAL AND OBJECTIVES

This report provides the industry executives with strategically significant competitor information, analysis, insight and projection on the competitive pattern and key companies in the industry, crucial to the development and implementation of effective business, marketing and R&D programs.

REPORT OBJECTIVES

- To establish a comprehensive, factual, annually updated and cost-effective information base on market size, competition patterns, market segments, goals and strategies of the leading players in the market, reviews and forecasts.
- To assist potential market entrants in evaluating prospective acquisition and joint venture candidates.
- To complement the organizations' internal competitor information gathering efforts with strategic analysis, data interpretation and insight.
- To suggest for concerned investors in line with the current development of this industry as well as the development tendency.
- To help company to succeed in a competitive market, and

METHODOLOGY

Both primary and secondary research methodologies were used in preparing this study. Initially, a comprehensive and exhaustive search of the literature on this industry was conducted. These sources included related books and journals, trade literature, marketing literature, other product/promotional literature, annual reports, security analyst reports, and other publications. Subsequently, telephone interviews or email correspondence was conducted with marketing executives etc. Other sources included related magazines, academics, and consulting companies.

INFORMATION SOURCES

The primary information sources include Company Reports, and National Bureau of Statistics of China etc.

Abstract

Cockpit SoC Supports More Displays, Beefs up AI, and Improves Functional Safety

Intelligent vehicle E/E architecture ushers in a period of intra-domain integration to trans-domain convergence and to central computer from the distributed one.

Source: Visteon

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For cockpit domain, the intra-domain integration calls for powerful cockpit SoC which caters to the current cockpits' needs to support more displays, enable more AI features and fuse with ADAS, have safer functionality, among others.

Support for More Displays

Against the trend of one core enabling multiple screens, it remains a decisive factor to being chosen by the user that how many displays a cockpit SoC can support. The third-generation Qualcomm Snapdragon cockpit SoC based on versatile CPU and GPU is an enabler for as many as six to eight displays.

Samsung Exynos Auto V9 processor is in favor of up to six in-vehicle screens and twelve cameras synchronously, which has been already found in Audi smart cockpits.

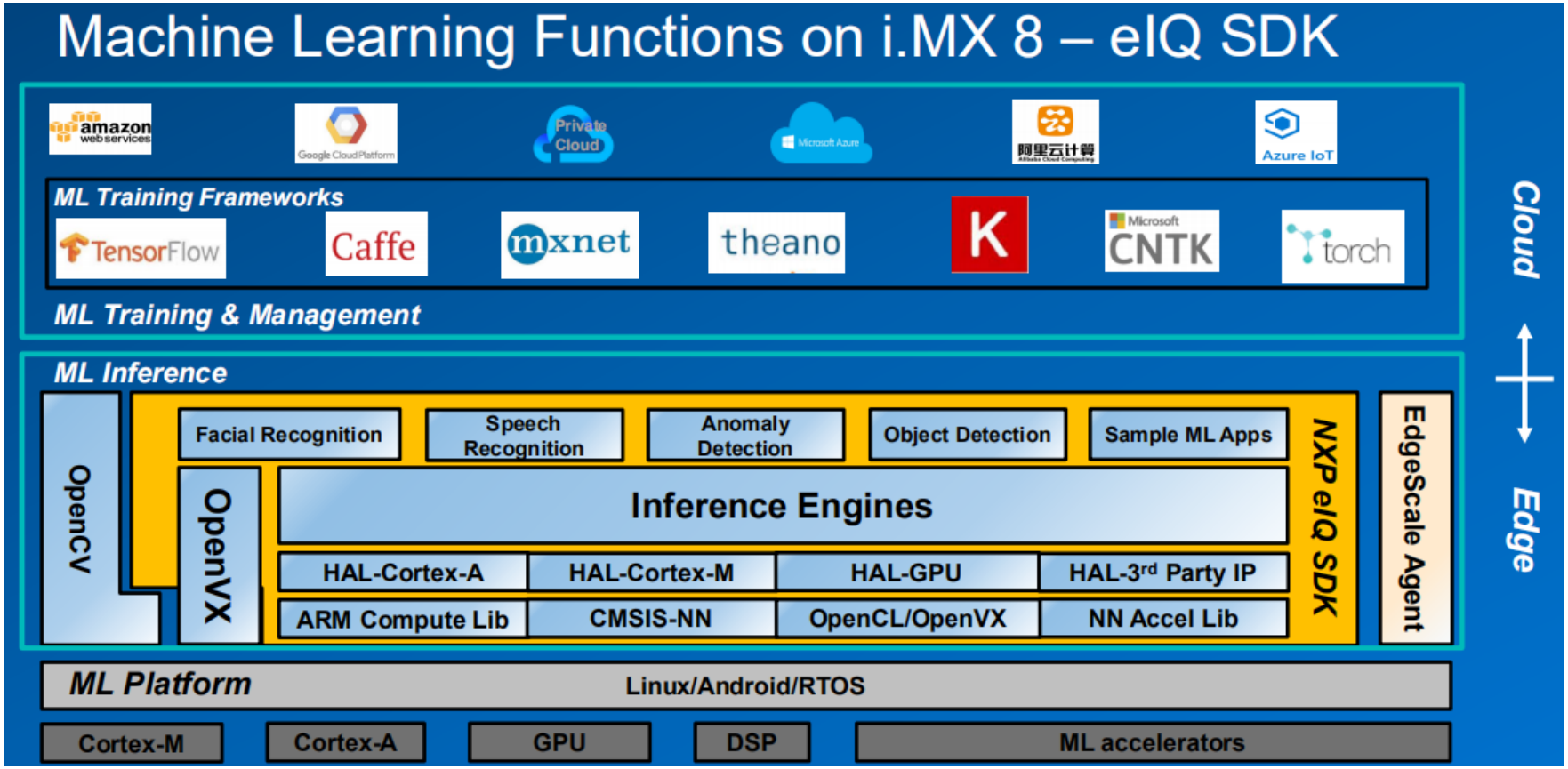
Designed for smart cockpit, SemiDrive X9 series unveiled by Nanjing Semidrive Technology Co., Ltd in 2020 support eight FHD displays and twelve cameras.

At CES2020, NXP showcased its multi-display solution supporting as many as 11 screens that are enabled by dual i.MX 8QuadMax.

Support for AI

Undoubtedly, NVIDIA stays ahead of its peers as concerns support for AI. NVIDIA rolled out CUDA in 2007 and had the idea of fostering an ecosystem via CUDA then, which is helpful to both hardware sales and its superiority in software as well as to user loyalty. Despite its cockpit SoC gets a clear edge in deep learning, NVIDIA enjoys not big a share in the cockpit processor market because of its automotive business focus on autonomous driving chips.

Through acquisition of Freescale, NXP is in possession of a machine learning expert team, i.e., CogniVue, an image recognition IP development team (acquired by Freescale in September 2015) based in Ottawa, Canada. NXP's eIQ automated deep learning (DL) toolkit enables the developer to introduce DL algorithms to application programs, and meets the strict automotive standards.



Apart from its efforts in nurturing AI capabilities, NXP has been paying attention to AI defects. Deep learning employs probabilities to recognize objects and the results are inexplicable, which is disastrous to cars with a high demanding on safety. NXP has been studying a method called “explicable AI (xAI)” that extends the machine learning reasoning and probability computing capabilities through addition of more rational and humanlike decision-making methods and extra deterministic dimensions, and that combines all merits of AI with reasoning mechanism to imitate human reaction.

Fusion with ADAS for Higher Functional Safety

Some ADAS features like surround view parking, pedestrian and obstacle recognition tend to be integrated in the cockpit domain, needing the cockpit SoC to consider ADAS related capabilities.

R-Car H3, for example, gets largely utilized in cockpit and can also cope with complex functions such as obstacle detection, driver status recognition, danger prediction and avoidance.

More and more smart cockpits are added with HUD, especially the latest AR-HUD integrated with ADAS, delivering capabilities like following distance warning, line press warning, traffic lights monitoring, ahead-of-time lane change, pedestrian warning, road mark display, lane departure warning, obstacles ahead, and driver status monitoring.

There will be higher requirements on functional safety once cockpit SoC is added with some ADAS features, which will, beyond doubt, pose greater challenge to the cockpit SoC suppliers.

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