CMS & DMS All-in-One Solution on NXP I.MX 8QM

Overview

Based on NXP I.MX 8QM SoC to make up full functions by the software solution. It could achieve CMS, BSD, BCWS functions based on two 60 degree cameras and one 120 degree camera, and combine DMS function by IR camera to improve driving safety and reduce possibility of accidents. According to lightweight and merging deep learning architectures, computer vision, computer graphics, heterogeneous multi-core scheduling, and memory access optimization technologies to solve challenges in image quality, variable driving environments, and hardware resource requirements. This solution could be the cost-effective purpose, and speed up time to marking, reduce R&D costs, and enhance product differentiation and competitiveness.

Strength

1. Technologies with 100% self-development to support customization and software defined products.
2. Solution working with two 60 degrees cameras and one 120 degrees camera installed to achieve CMS, BCWS, BSD, and DMS by IR camera to identify driver's behavior functions simultaneously.
3. Support production tools to reduce requirements of FAE resources.
4. One model supports multi-camera and multi-function to reduce requirements of computing power and memory.
5. All-in-One box supporting different vehicles, and software update reducing maintenance costs.

Feature

1. CMS supports to show the blind view around vehicle, with changes of view settings to provide the driver with better views based on BSD and BWS detection results.
2. BCWS functions include 4-wheel vehicles, 2-wheel vehicles, pedestrians detection, and is adaptable to different road types and weather, which of vertical distance is up to 15M, and horizontal distance up to 3M, under any self-vehicle's speed.
3. BSD functions include 4-wheel vehicles, 2-wheel vehicles, pedestrians detection, and is adaptable to different road types and weather, which of vertical distance is up to 15M, and horizontal distance up to 3M, under any self-vehicle's speed.
4. DMS functions include detection of turning head, closed eyes, smoking, using mobile phone, and is adaptable to drivers with wearing masks and glasses.

Block Diagram