
nextchip
Seize the Sight on Time

nextchip

Human Vision to Machine Vision

ON BOARD

Since 1997,
Nextchip has dedicated its time
to develop better vision technologies for over 2 decades.
Nextchip can deliver
the overall technology for processing from Human Vision to Machine Vision
within the vehicle itself.

NEXTCHIP HIGHLIGHTS

GLOBAL SALES NETWORK

#8

EU/US/CN/JP

PATENTS LOCAL & OVERSEAS

#100

IN ISP & AHD™

AUTOMOTIVE CERTIFICATION

#7

CMMI-DEV V2.0 Lv.3
ISO9001/14001
ISO26262
AEC-Q100 Gr.2
A-SPICE Lv2&3

UNRIVALED NEXTCHIP

Continuously Updated MP Records & On-going Projects

24 years Know-how

- Proprietary Image Processing Algorithms
- Tuning Know-how at Various Scenario
- System friendly design
- Specialized in Customer Support

Strong relation

- Close communication with OEMs and Tiers
- Technology Marketing Know-how based on Broad Experience in automotive market

Record Proven Strategy

- Develop and Release New Products Based on Market Requirements
  : Application Bonding Products
- Targeting Affordable Car line-up
  : Securing Sales Volume

RECORD PROVEN

More to be Updated

~ 2019	20.1Q	20.2Q	20.3Q	20.4Q	2021~
 X7	 RX5 / RX5MAX	 AVANTE (Elantra)	 SANTAFE	 BI3(New)	 CARNIVAL	 GENESIS	 G90
 EU5	 CE16	 AVANTE(Elantra) Hybrid	 QY(New)	 K5	 KS(New)	 BN7id(New)
 J6P	 JETOUR	 i20	 MISTRA		 Tucson	 NEc(New)
 星越	 IX25	 SONATA			 Sportage	 NP PE

STRONG CORRELATION

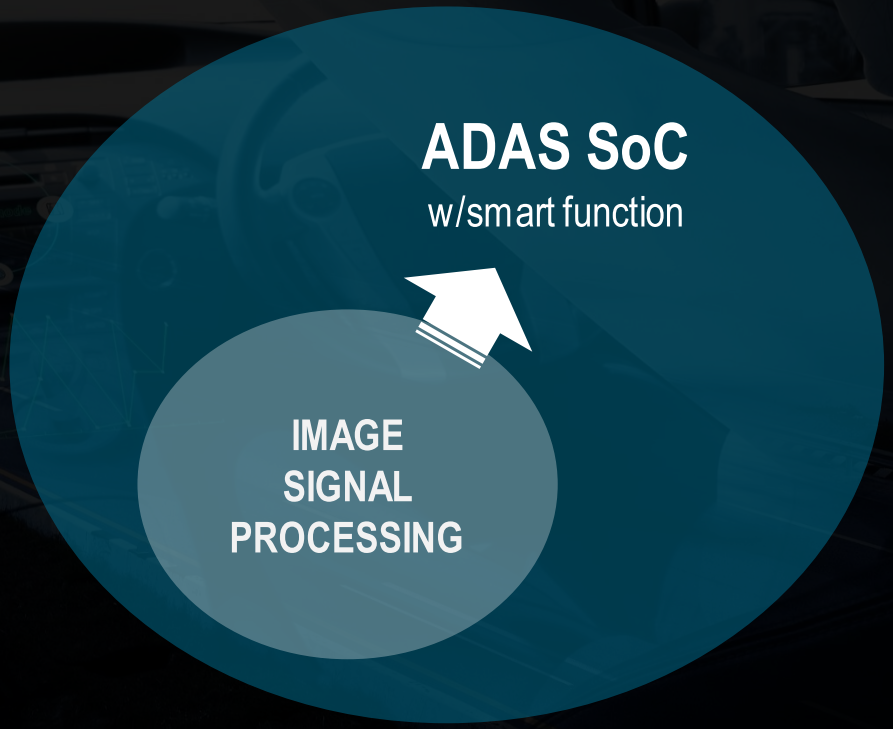
nextchip

HYUNDAI
KIA MOTORS
HYUNDAI MOBIS
北京现代 HYUNDAI
东风悦达·起亚 KIA MOTORS
上海大众汽车 SHANGHAI VOLKSWAGEN
Volkswagen
Mercedes-Benz
mazda
RENAULT NISSAN MITSUBISHI
GM
Ford
SAIC 上汽集团 SAIC MOTOR
DONGFENG DONGFENG MOTOR CORPORATION
SHANGHAI GM
CHERY
吉利汽车 GEELY AUTO
STELLANTIS
SSANGYONG
MARELLI
BYD
TATA
Mando
YURA CORPORATION
LG Innotek
HYUNDAI AUTRON
HUMAX
MCNEX
SEKONIX
ADAYO
SL Corporation
APTIV
Longhorn 豪恩
TTE 同致電子企業股份有限公司 TungThih Electronic Co., Ltd.
ALPINE Driving Mobile Media Innovation
Softec 晟泰克
DESAY SV AUTOMOTIVE
ECARX 亿咖通科技
STEELMATE Automotive
PRIMAX
HIKVISION
HSAE 航盛
LITEON
Zong Mu
上富电技 COLIGEN 汽车驾驶安全解决方案提供商
WHETRON
佳能企業股份有限公司 ABILITY ENTERPRISE CO.,LTD
Baidu 百度
MAGNA
Visteon
GENTEX CORPORATION
SHARP
BOSCH
Continental
Valeo
ZF
ROSCO VISION SYSTEMS
3rd EYE
pony.ai
KYOCERA
JVC
RICOH
FICOSA
SMR TECHNOLOGIES
GENERAL
faurecia clarion
Panasonic
Nidec NIDEC COPAL ELECTRONICS
DENSO TEN
KOSTAL
SMK
NIPPON CHEMI-CON
ARRIVAL
Leopard Imaging
D3 Engineering
multicoreware
ON Semiconductor
SONY
OmniVision
SAMSUNG
maxim integrated
Texas Instruments
PATHPARTNER
NVISO
CEVA
AIMOTIVE
DGIST Daegu Gyeongbuk Institute of Science & Technology
ETRI
KETI
eSOL
MegaChips
POSTECH 포항공과대학교

HUMAN VISION
TO MACHINE VISION

FROM IMAGE PROCESSOR TO ADAS PROCESSOR

Using experience and established ecosystem in automotive market, have expanded market to sensing(ADAS)



WHERE IN ADAS MARKET

FOCUSING ON WHERE VOLUME IS

The Highest ADAS level adopted in the vehicles on the road is LV2+/3, and level 3 only applies to luxury vehicles.
There will be lots of obstacles to produce cars accompanied by ADAS Level 4,5 in the volume market due to regulatory issues or instability of tech's performances, and high cost of the whole system.
Many researchers and market players assume it will take a long time for fully autonomous vehicles to be mass-produced.

HOW TO FIT IN ADAS MARKET

nextchip

Image Edge Processor

Processing capable in the sensor itself

AI Powered Camera

▲ Maximizing Computing Power

▼ Size & Power Consumption suitable to put in camera module

APACHE4

Triple core ARM Cortex R5F & CEVA XM4

APACHE5

Quad core ARM Cortex A53 & Aiware(NPU)

FIT Domain Controller

Purpose Fit-in Processor

High computer power applicable in the ECU

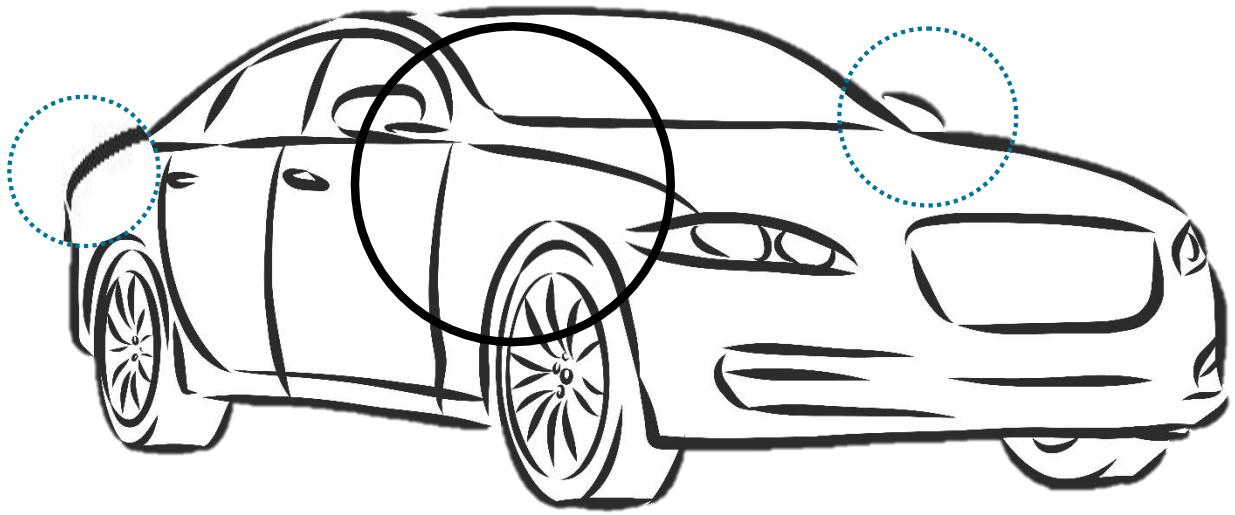
▲ Utilization Rate, Cost Effectiveness

▼ System Complexity, Power Consumption

APACHE6

ARM Cortex-A8 Quad Core 64 bit

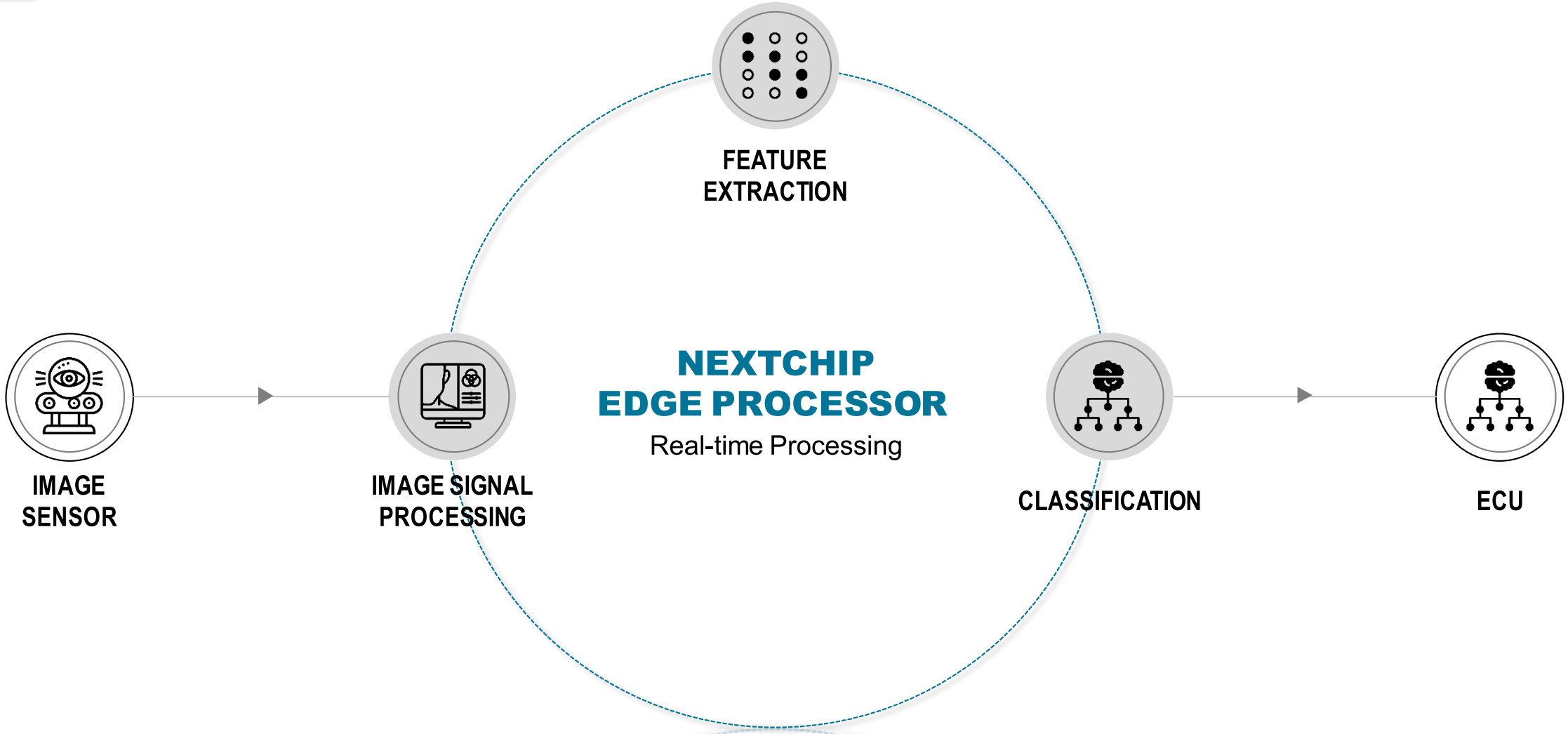
GPU(>85GFLOPS), NPU(8TOPS) embedded



STEP 1. STEP 2.

A D A S A D

WHAT
EDGE PROCESSORS DO

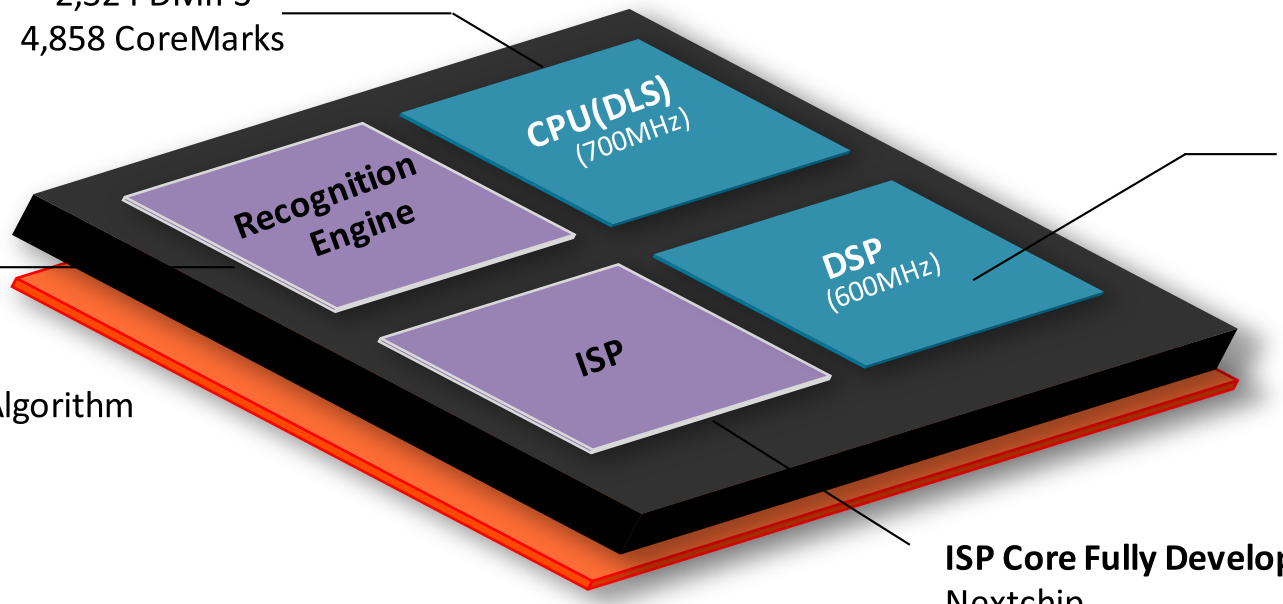


DESIGN
WHAT EVER YOU WANT

APACHE4

Sourced by CEVA

AlexNet Perf. (1000 classes, 227x227)			Tiny YOLO (448x448)		
MC/Image	BW/Image (MB)	ROI/SEC @600MHz	MC/Image	BW/Image (MB)	ROI/SEC @600MHz
23	18	26	75	425	8



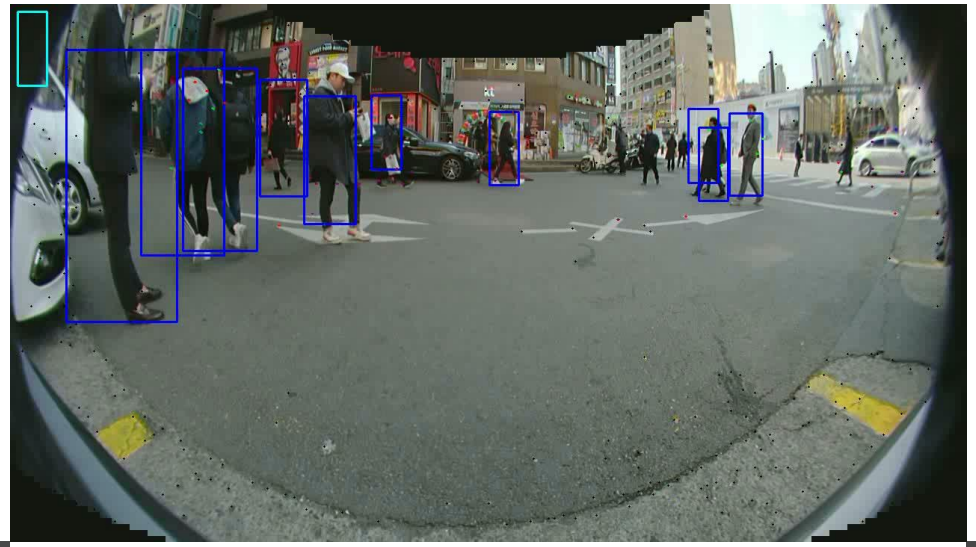
2,324 DMIPS
4,858 CoreMarks

77 GMACS
173 GOPS

mACF
Computer Vision Algorithm
***Hardwired**

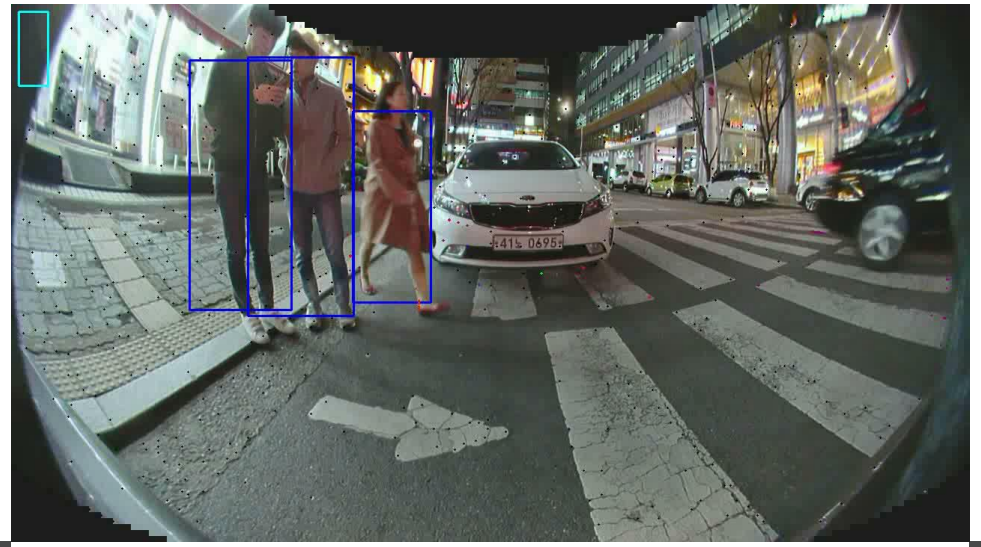
ISP Core Fully Developed by
Nextchip

USECASE
RearAEB



Video Link

PD in High Illumination

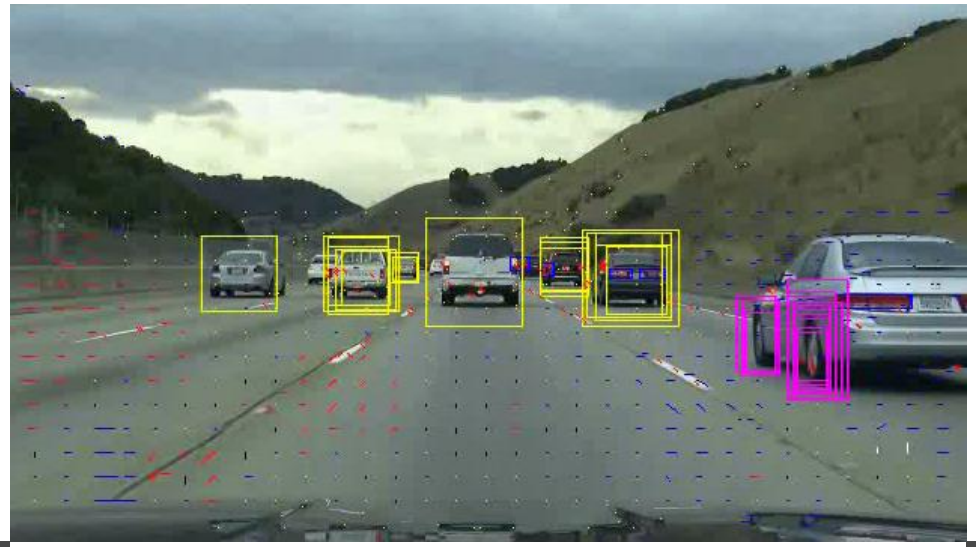


Video Link

PD in Mid Illumination

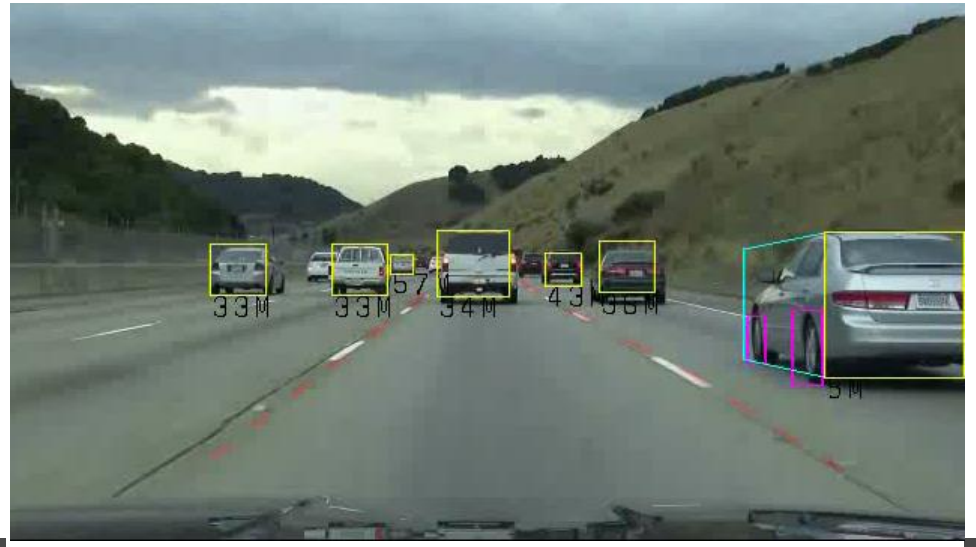
Detection by APACHE4

USECASE
FRONT SENSING



Video Link

LD+ VD + MVD + Tracking



Video Link

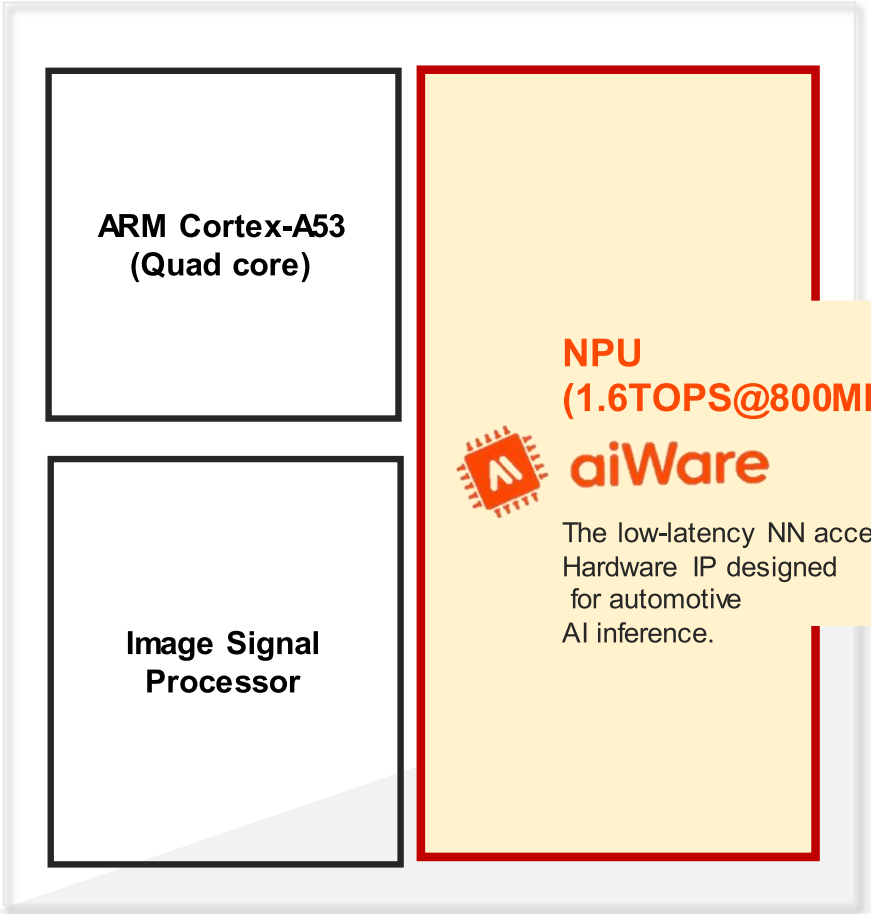
+ Clustering(SW processing)

Detection by APACHE4

RIGHT NPU
FOR EDGE PROCESSOR

APACHE5

APACHE5 Brief Block Diagram



Optimized for Vision NN

Designed right for executing deep CNNs
Appropriate for larger input as high resolution image

Low Latency & Power Consumption

Throughput optimized frame by frame
On-chip SRAM

High Level of Autonomy

Fully executes all operations for compiled NNs
No additional support from the host CPU

Highly Deterministic

No caches or Programmable data-paths
Ideal architecture for ASIL & Safety-related applications

AVP
PURPOSE FIT IN PROCESSOR

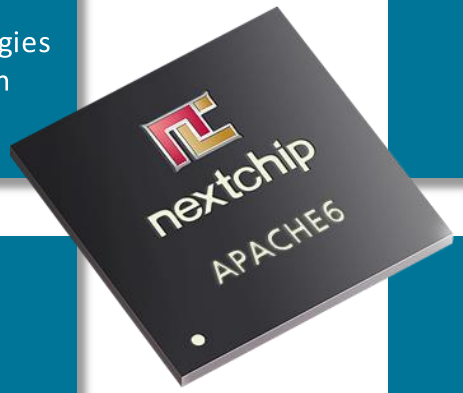
APACHE6

WELL PREPARED S/W

Possess quad core technologies enable full-stack solution for AVP

4~6 CAMERA CH IN SINGLE PRODUCT

4~6 CH
High Resolution
ISP core



FUSION SENSOR DATA

Interface for
USS, Lidar and Radar
processed data

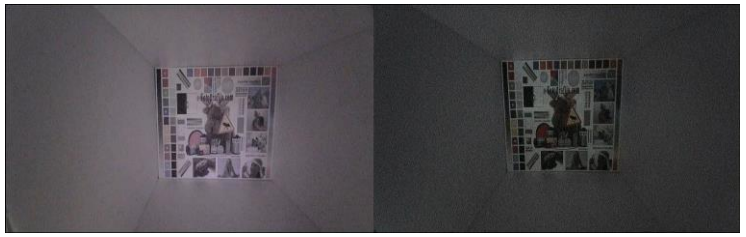
Functional Safety

ASIL Compliant
Right for
Domain Controller

CORE TECHNOLOGY
ISP (IMAGE SIGNAL PROCESSING)

Support Multiple CFA

Color Interpolation of Various CFA
RGB, RCCB, RGBIR, RYYCy, RCCC



RGBIR RGGB

RCCB RGGB

Right Tuning for Sensing

Tuning experience in various scenario even for sensing purpose
AE, AWB, Tone Mapping, HDR, LFM and MORE

ISP tuning X **ISP tuning O**

Video Link

CORE TECHNOLOGY
ISP (IMAGE SIGNAL PROCESSING)

Perfect in Every Environment

High Dynamic Range up to 120dB
Wide Range LED Flicker Mitigation
(Specific Imager Required)

Video Link

HDR Off HDR On

Video Link

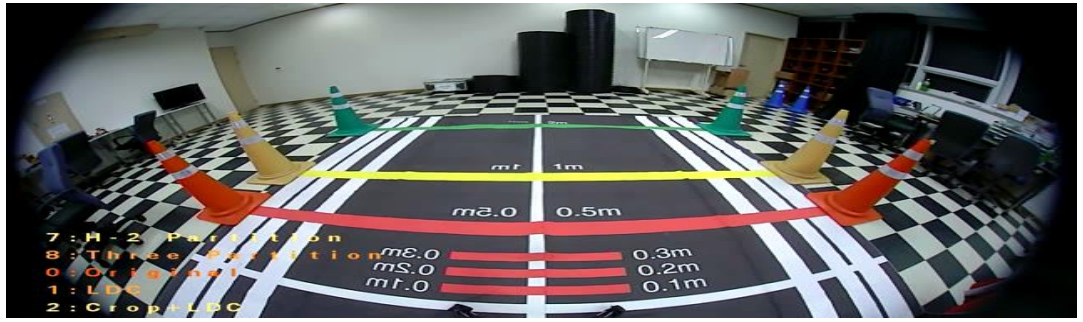
LFM Off LFM On

Special Filters for Better Image Quality

Support Functionality for Each Application/Use Cases
Tuning Capability in Various Scenario

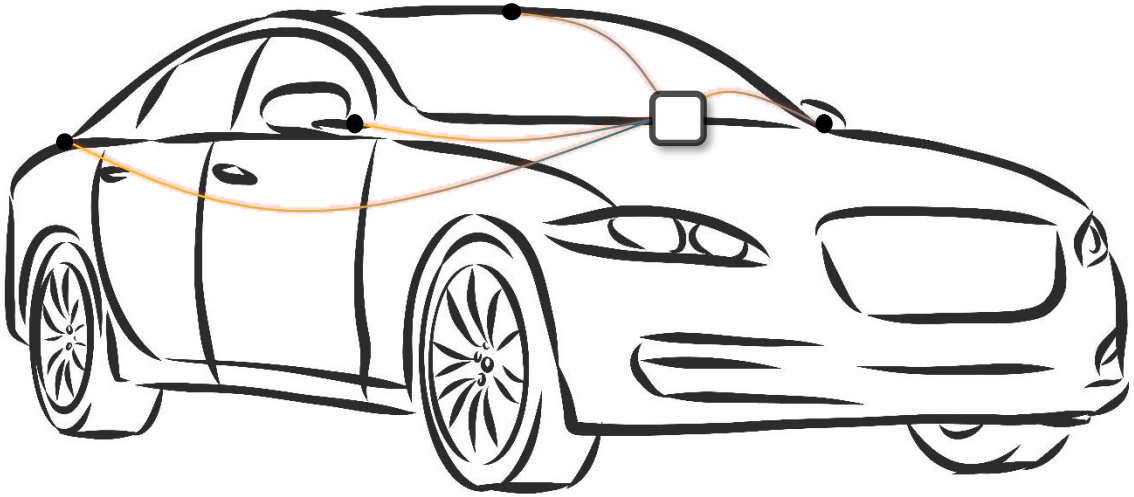
NR Off NR On

Video Link(LDC+PGL)



LDC(Dewarp) + PGL+Viewmode

THE FIRST ANALOG VIDEO TRANSMISSION AHD™



Indistinguishable to Digital transmission

World's 1st Adopted Analog HD Transmission Technology to Mass Produced Vehicle

- TX in ISP → RX on Display

Reliability : EMC Test Approved
High Image Quality
Expandability : Longer Distance
Compatibility : Cable Independency
Cost Leadership

Mass Production Started From Nov.2019 !

THE NEXT STEP OF AHD™

WHAT'S NEXT

AHD™ SECOND GENERATION

Substitutable LVDS Fully
But added more value on it

Bi-directional Comm.

Support Upstream Communication
for transferring bigger data size
+ Signal/Cable Diagnosis Available

Higher Resolution

Upto 8M@15fps
as Automotive grade chipset

Bayer Transmission

AHD™ TX standalone Chip Available
Transfer raw data from sensor to ECU

ROADMAP

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PRODUCT LINE UP
AVAILABLE NOW

		HD	FHD	QHD	UHD
ISP	Rear View	NVP2631 : 2M@60fps (RGB) Input: Parallel, Sub-LVDS / Output: AHD™, Parallel			
		NVS2632/5 : 2M@60fps (RGB, RCCB) Input: MIPI/ Output: AHD™, MIPI, Parallel			
		NVS2633 : 2M@30fps (RGB) Input: Parallel, Sub-LVDS / Output: AHD™, Parallel			
	CMS, E-mirror, SVM	NVP2650 : 2M@60fps (RGB, RCCB) Input: MIPI / Output: AHD™, MIPI, Parallel			
		NVP2650D : 2M@30fps (RGB, RCCB), Dual ISP Input: MIPI / Output: MIPI			
	Front View	NVP2670 : 5M@30fps (RGB, RCCB) Input: MIPI / Output: MIPI, Parallel			
ADAS SoC		APACHE4 : 5M@30fps (RGB, RCCB) Input: MIPI, Parallel / Output: MIPI, Parallel Hardwired Detection Engine (ex) PD, VD, LD, MVD etc) DSP / ISP Core embedded			

AHD™ RX

NVP6321
- 1CH RX
- Up to 2M@30fps
- Output: Parallel

NVP6324
- 4CH RX
- Up to 2M@30fps
- Output: MIPI, Parallel

※ All AEC-Q100 Gr.2 Qualified

✓ Functional Safety

PRODUCT ROADMAP ALL

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2021 | 2022 | 2023

1Q 2Q 3Q 4Q | 1Q 2Q 3Q 4Q | 1Q 2Q 3Q 4Q

ISP &AHD™

APACHE_U
8M@30fps(RGB, RCCB, RGBIR, RYYCy)
Input: MIPI/ Output: MIPI

APACHE_M
Multi CH ISP (4-CH)
Input: MIPI / Output: MIPI

PHOENIX
5M@30fps(RGB, RCCB, RGBIR)
Input: MIPI
Output: MIPI

AHD TX
1CH TX
Up to 2M@60fps
Input: MIPI (Bayer Transmission)

AHD RX
4CH RX
Up to 2M@60fps
Output: MIPI
(Bayer Transmission)

AHD RX
1CH RX
Up to 2M@60fps
Output: MIPI (Bayer Transmission)

ADAS SoC

APACHE4
Computer Vision Based
Edge Processor
5.7M@30fps(RGB, RCCB)
Input&Output: MIPI, Parallel
Hardwired Detection Engine
ex) PD, VD, LD, MVD etc
ISP/DSP embedded

APACHE5
CNN Based
Edge Processor
5.7M@30fps(RGB)
Input: MIPI
Output: MIPI, Ethernet
1.6TOPS recognition IP
ISP/ NPU embedded

APACHE6
AVP Fit-in Processor
(Sensor Fusion)
8M@30fps(RGB, RCCB, RGBIR)
Input: MIPI
Output: MIPI, Ethernet, USB3.0
GPU(>85GFLOPS), NPU(8TOPS) embedded
VSLAM Accelerator

AHD™

※ All AEC-Q100 Gr.2 Qualified

Functional Safety

nextchip

Thank You