Accelerating the Development of Intelligent, Vision-Enabled Devices at the Edge

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LATTICE SEMICONDUCTOR

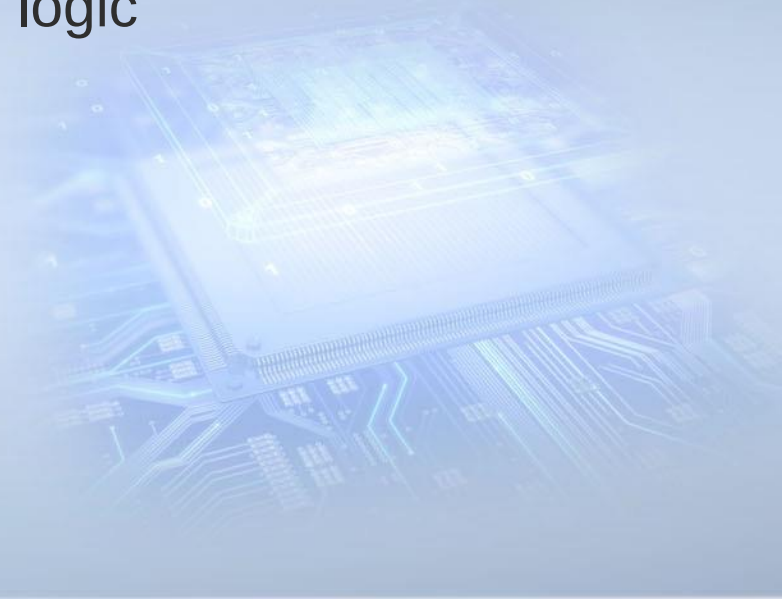
The Evolution of Embedded Vision

- 10 years ago
  - Primarily used in highly specialized applications
- Today
  - Exciting new use cases
    - Industrial
    - Automotive
    - Consumer
  - Advanced robotics
  - Machine learning
  - Industry 4.0

Technological Change

What Happened?

- Many key components and tools emerged
- Processing needs
- Low cost processors & programmable logic
  - Applications Processor (AP)
  - ASIC
  - ASSP
  - FPGA
  - Co-processing
    - Added horsepower



The Three Catalysts

Mobile Influence

- Rapid development of mobile market
  - High performance processor at low power
- Success of Mobile Industry Interface (MIPI)
  - Compliant HW and SW
- Low-cost sensors and cameras
  - High integration at low cost

mipi alliance

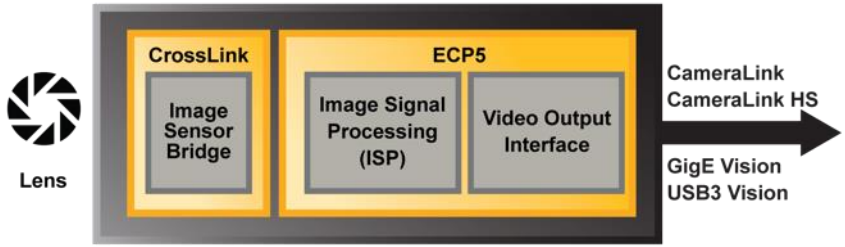
Designer's Challenge

- Addressing connectivity challenges
- Leveraging economies of scale
- Preserving investment in legacy devices
- Creating customized prototypes quickly
  - Cost-effectively
  - Reusing existing designs

Industrial Use Case #1

Machine Vision Smart Camera

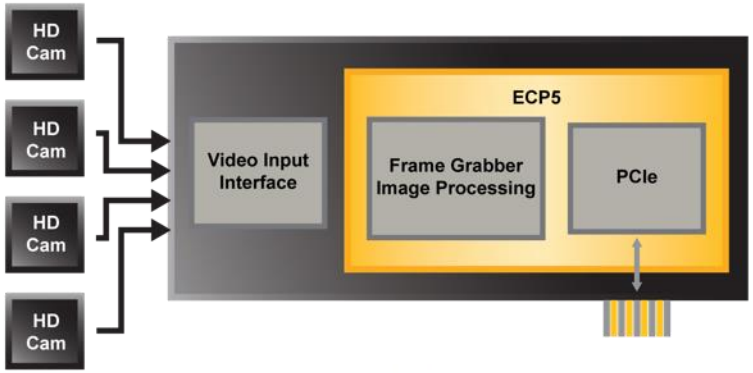
- Manufacturing process monitoring
- Quality management
- Compact vision systems
- Processor module
- FPGA
  - Image Signal Processing pipeline
  - Connectivity
    - USB Vision
    - GigE Vision



Industrial Use Case #2

Video Grabber

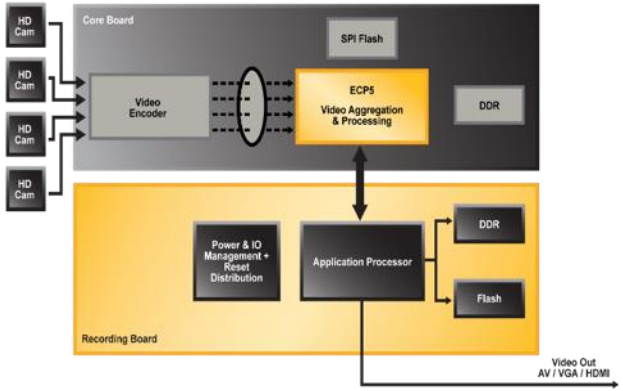
- Data aggregation
  - Multiple cameras
  - Image pre-processing
  - Host processor connectivity
    - PCIe Interface

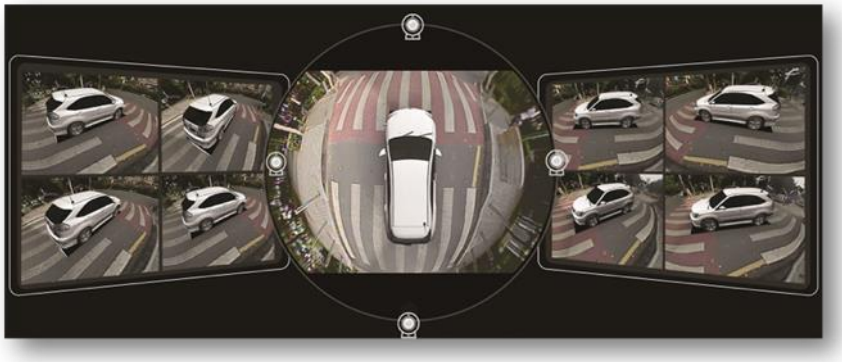


Automotive Use Case #1

Bird’s-eye-view 360 Automotive Camera System

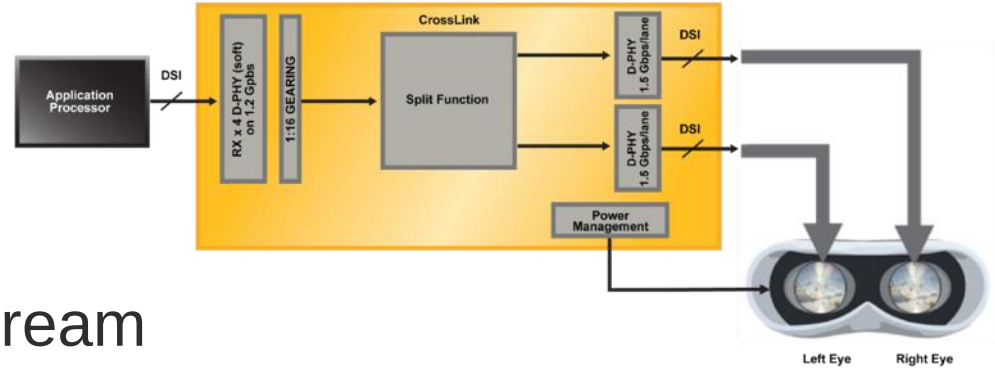
- Advanced Driver Assistance Systems (ADAS)
- Backup cameras
- Lane departure
  - Lane detection algorithm
- Smart camera module
  - Analytics algorithm





Consumer Use Case

FPGA-based Virtual Reality System

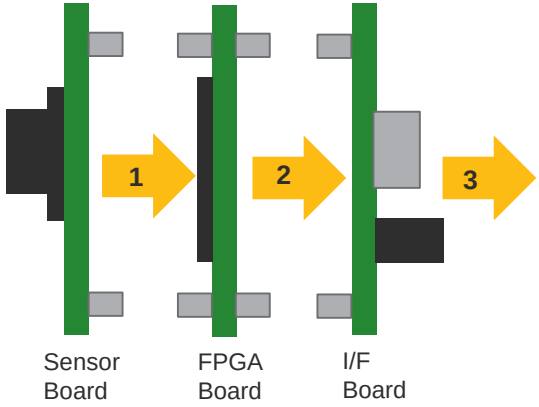


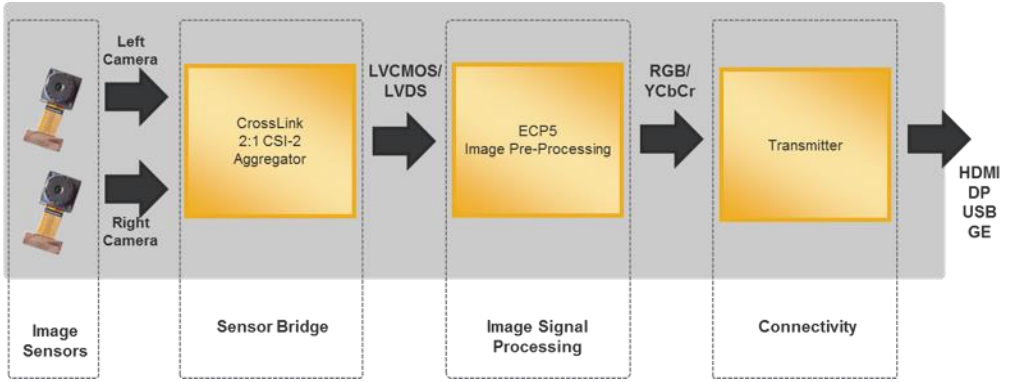
- Augmented reality (AR)
- Virtual reality (VR)
- Converting single video stream
  - By splitting the content to a dual display
- Low cost mobile MIPI DSI displays
  - Low latency
  - Minimal power consumption

Master the Challenge

Rapid Prototyping with an Embedded Vision Development Kit

- Use a modular approach
- Fast product development cycle
- Lowest cost
- Lowest power
- Customizable prototyping system
- Based on existing hardware and software
- Reuse existing element
- Sensor bridging
- Image processing
- Connectivity





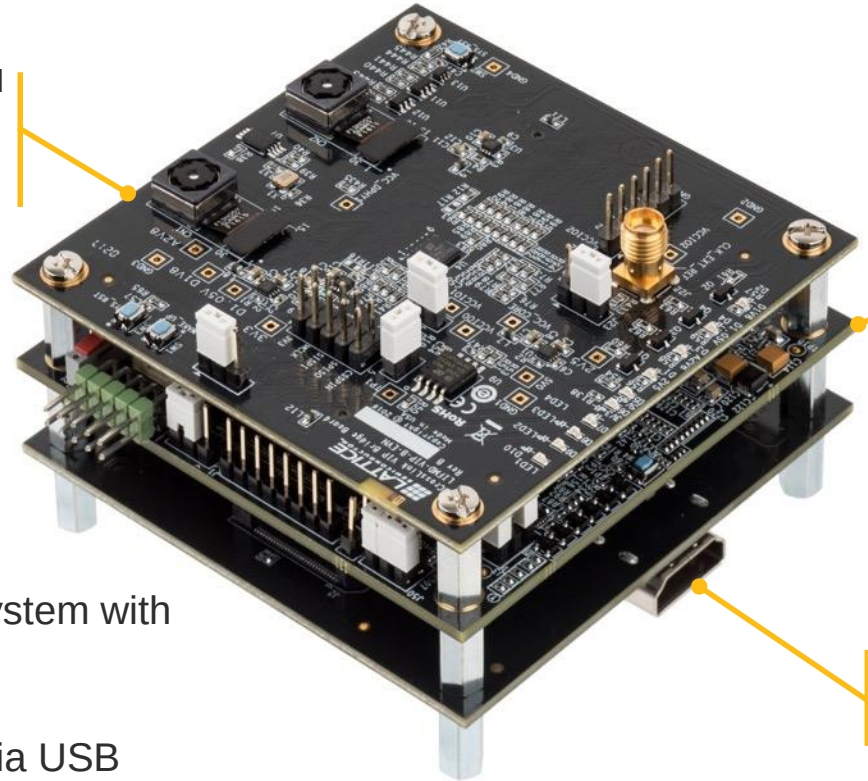
Lattice's Embedded Vision Development Kit

Stackable Modular Video Interface Platform (VIP)

NOW
$199*

CrossLink Input Bridge Board
- LIF-MD6000 pASSP
- Two Sony IMX 214 Cameras
- 2:1 CSI-2 MUX

Sensor Interface



ECP5 Processor Board
- ECP5-85 FPGA
- Image Signal Processing

IONOS ISP Pipeline

HDMI Output Bridge Board
- SiI1136 HDMI ASSP
- Non-HDCP Output

- All-inclusive demo system with video sources
- Prototyping header
- Easy programming via USB interface

*Through December 31, 2018

Video Interface Platform (VIP)

Smart Modular Solution for Embedded Session Prototyping

Seamlessly interconnect

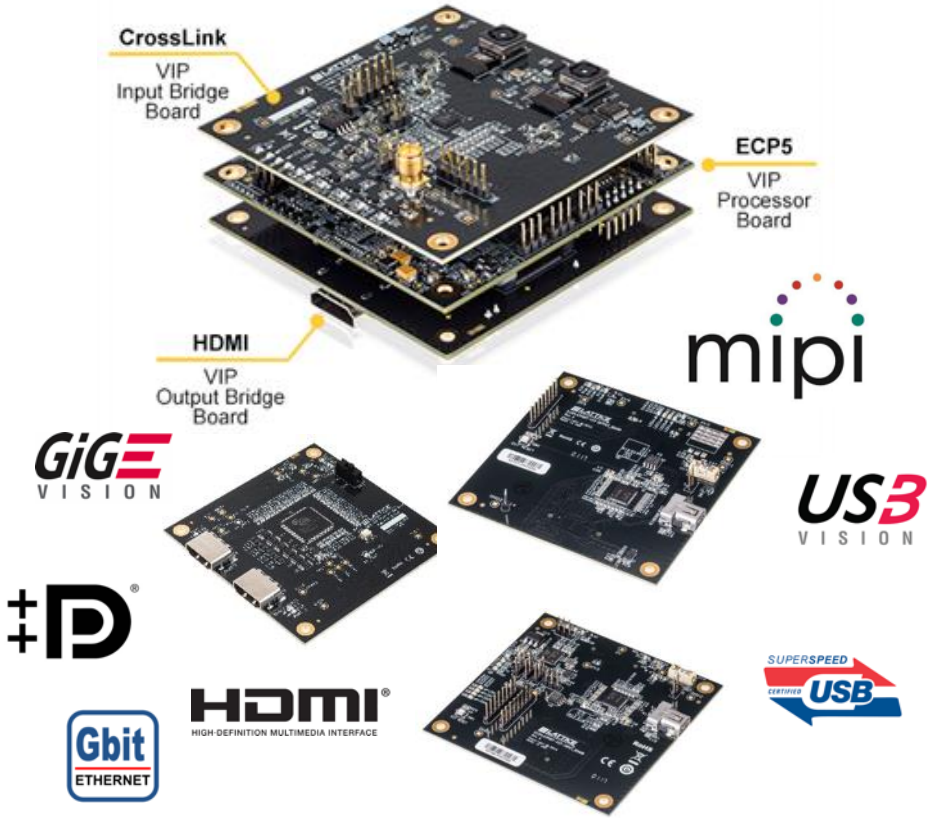
- Highly flexible
- Cost efficient

Supports multiple I/O standards

- USB
- GE
- DP
- HDMI®
- MIPI

Mobile influenced platform for

- Industrial
- Automotive
- Consumer



Summary

- Use a modular approach
- Consider mobile influenced technology
- Take advantage of existing hardware building blocks
- Lattice’s Embedded Vision Development Kit offers modular solution

Thank you!

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