

iW-RainboW-G34S

i.MX 8M Mini SBC Embedded Vision Applications

Design compact vision systems

Introduction

In the last few years, the trend toward miniaturization has highly impacted the world of vision technology. A classical machine vision system consisted of an industrial camera and PC, which were expensive and difficult to handle. In contrast, an embedded vision system offered a viable alternative to machine vision systems by replacing them with processing boards with support for board-level cameras.

These two developments - the miniaturized PC and the powerful camera have made it possible to design compact vision systems for specific applications. The benefits of using an embedded vision system include small size, lightweight, low unit costs, and low energy consumption.

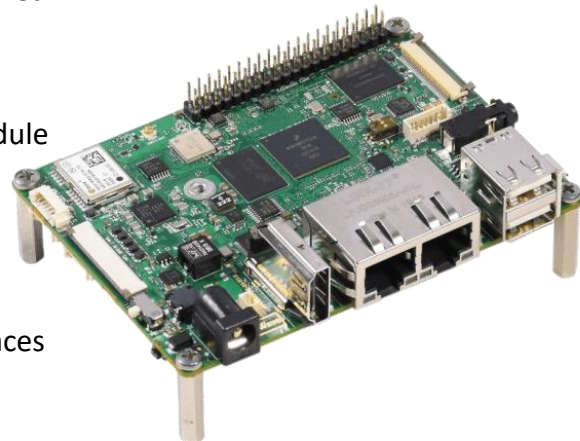
Lately, iWave delivered [i.MX 8M Mini Single Board Computer](#) to a deep tech company to aid them in designing high-quality gemological instruments for testing the quality of gemstones and diamonds. There are multiple testing and characterization procedures involved in gemstone testing. The client required off-the-shelf computing hardware with a wide range of interfaces to speed up their product development time with reduced risk.

Challenges

- Specialized computing hardware that contains interfaces optimized for image processing
- Standard compliance - USB, MIPI-CSI, LVDS interface support
- Required shorter project timeline to improve time to market

Solution Highlights

- Integrated i.MX 8M Mini SBC with MIPI CSI-2 camera module
- High-performance 3D graphics processing unit (GPU)
- 1080p60 video decoding (HEVC/H.264, H.265, VP9, VP8)
- 1080p60 video encoding (H.264, VP8)
- PCIe, Gigabit Ethernet, USB 2.0, and multiple SDIO interfaces
- Supports HDMI, MIPI-DSI, MIPI-CSI, and LVDS connectors



As the technologies used to create fake gemstones become easy, so must the methods used to detect them. Test laboratories have been employing different analytical techniques to distinguish modern-day gems. By leveraging advanced imaging and analysis techniques, embedded vision technology has proven to be an excellent solution for detecting the quality of gemstones.

The embedded vision solution relies on a high-performance processing board supporting various interfaces optimized for image processing, including MIPI, USB, or GigE, allowing connections of different camera types. The i.MX 8M Mini SBC supports MIPI-CSI, LVDS connectors, PCIe, USB, and Gigabit Ethernet, making it ideal for developing vision applications.

The [i.MX 8M Mini SBC](#) features multi-core heterogeneous MPUs and provides high-performance computing, power efficiency, and embedded security for AI, machine vision, and edge node computing applications. The i.MX 8M Mini SBC is an ultra-low-power module with real-time processors integrating four Arm Cortex-A53 cores running up to 1.8GHz and a 400MHz Cortex-M4. It supports 2D and 3D graphics and includes a 1080p video accelerator to support two-way video applications to provide a rich visual experience. The i.MX 8M Mini SBC also offers an extensive selection of high-speed interfaces, enabling broad system connectivity and simplifying industrial qualification.



The i.MX 8M Mini SBC eases installation for system integrators with simplified wiring and extended onboard coverage. Furthermore, an SBC reduces the time required to redesign the end solution, saving time and money.

For more details, contact us at mktg@iwavesystems.com



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