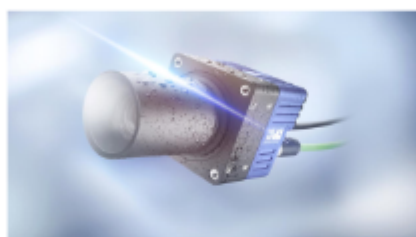


Vision spectra

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Multi-Core Acquisition Optimizer for Fast GigE Vision cameras



Caption: 10GigE camera from MATRIX VISION

Multi-Core Acquisition Optimizer for Fast GigE Vision cameras

MATRIX VISION provides software solutions for distributing the network data processing to several CPU cores.

Imagine that you are using a new 10GigE industrial camera that enables the increase of the clock rate of your application thanks to the high frame rate. You install the new camera and connect it to the computer. The application starts at the maximum frame rate. But when you also run an algorithm for processing the images, you identify that the CPU of the host system is overloaded. This bottleneck when processing the data can lead to losses during the data transmission.

Modern computer architectures generally have several CPU cores in a single chip or even several physical CPUs on a motherboard. For this reason applications often use several threads or processes in order to evenly distribute the generated CPU load to all available processors and thus achieve an optimal performance. Optimal performance generally means obtaining certain results faster than they could be generated by a single thread. It also means that a graphic user interface remains responsive, while certain tasks are run in the background.

With GigE Vision cameras, which stream with bandwidths of 5 GB/s or more, this sometimes causes a bottleneck. Particularly the maintenance of a stable data reception without loss of individual images or parts of images, while large data volumes are processed at the same time, no longer works as reliably as expected.

This is because a network connection related to the operating system is always processed by a certain CPU core. This procedure works well and improves the system performance if several parallel connections from one device transmit similar low volumes of data per time window. However, with GigE Vision devices a single network connection contains all or at least a significant amount of the data that are received from a network card (NIC) in the system. As a result, one CPU core is overloaded with more work than another.

With a 1 GB/s connection the optimized NIC drivers and GigE Vision filter drivers in combination with a high-performance CPU can manage the incoming data. However, 5 GB/s or higher bandwidths, which come from one device via a single connection, pose a much greater challenge for current CPU architectures.

MATRIX VISION provides software solutions for distributing the network data processing to several CPU cores. Imagine that you are using a new 10 GigE industrial camera that enables the increase of the clock rate of your application thanks to the high frame rate. You install the new camera and connect it to the computer. The application starts at the maximum frame rate. But when you also run an algorithm for processing the images, you identify that the CPU of the host system is overloaded. This bottleneck when processing the data can lead to losses during the data transmission.

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