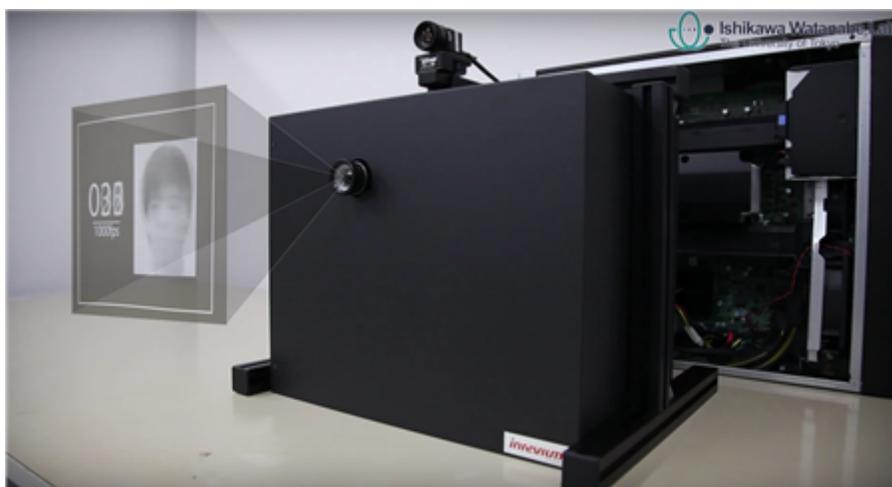


There's More than Meets the Eye When Designing for Industrial Projection



Michael Wang

Many video projectors, like those used in a movie theater, classroom or your business's meeting room, are designed for the human eye. However, not all projectors are meant for human consumption. Many industrial application areas, such as [3D machine vision](#) and dynamic projection mapping, require an industrial projector with higher frame rate and lower latency. This is particularly important in factory automation settings where industrial projection is used to correctly select, position or place objects in their appropriate location.



You might ask why frame rate and latency are important. A frame per second literally means the number of images that can flash across the screen every second. Higher projector frame rates combined with a high speed camera is a means to capture visual information in a shorter period of time, which helps improve accuracy and throughput of machine vision systems. Inline 3D printed circuit board (PCB) inspection is one of the industrial applications that benefit from high frame rate. It is used in the assembly line to inspect appropriate amounts of solder paste and whether components are properly placed, which helps improve PCB production yield.

Latency, meanwhile, is the very slight delay that occurs between the time something is imaged and the time it is projected. Low latency is important for better synchronization between the projected image and camera, which allows for a machine vision system, such as robotic equipment, to react at the right time. Digital projection mapping is an application that benefits from low latency to quickly and accurately follow the projected object.

A new demonstration showing a solution running at 1,000 frames per second with a 3 millisecond delay could be a big advancement in the field. It incorporates the [TI DLP7000](#) XGA chipset with a high speed industrial camera and a personal computer to deliver such high performance. While traditional consumer projectors achieve up to 120 Hz, some high speed chips in TI's DLP Products portfolio are designed specifically for industrial solutions, achieving up to 1,900 Hz at 8 bit-depth.

The demo was created by Tokyo Electron Device Ltd., one of many [DLP Design Network](#) partners, and the University of Tokyo. From dynamic projection mapping to PCB inspection and factory automation, it certainly offers an interesting glimpse into the future of machine vision. Watch the [video](#) to better understand how this technology works.

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