



Visionary

Interview with Terry Arden, CEO LMI Technologies

INSPECT: Market studies of the industry associations from both sides of the Atlantic point this out: Optical 3D technologies are clearly on the rise. For LMI, global manufacturer of 3D Sensor Technology for more than 30 years now, this is nothing new, right?

T. Arden: Indeed – this is nothing new. With 3D measurement as our business focus we continually see the interest increase. Significant is that LMI remained profitable in 2008 when the overall industry for machine vision felt the downturn which I believe reflects the interest in this technology and its benefits.

What have been, from your point of view, the main technological breakthroughs leading to a much higher interest in 3D machine vision and inline 3D metrology on the customer side today?

T. Arden: Looking at the technology - it is primarily driven by the success of the CMOS imager where sensitivity, noise level, and frame rate improvements have delivered high performance yet low cost 3D solutions. This is also supported by a healthy selection of faster embedded processors and the standardization toward Ethernet. All of this has provided a backbone of technology that drives solutions with higher accuracy and higher speeds to solve 3D vision problems.

I also believe that the 2D world has come to a level of maturity such that future advances in algorithm development may come in smaller incremental improvements. Attempts to use 2D cameras and algorithms for 3D applications can

become very complex and may be less robust than what can be a simple 3D solution. Whenever there is an attempt to solve a problem with complex algorithms to translate data from one realm (2D) into another (3D), the results may not be as robust or predictable. In other words, 2D provides many, many great solutions for the flat domain it was intended but 3D provides many, many better solutions for the real world.

I believe that the vision industry is realizing that 3D is the right solution for many inspection problems that 2D can't effectively solve – specifically where edges cannot be generated by simple illumination from which measurements are driven. 3D provides another dimension from which to create edges and therefore measurement features where 2D fails.

What will be the main application areas for 3D machine vision in the future?

T. Arden: Measurement, inspection, and error proofing for factory automation. Measurement to determine how to process the raw material based on size or shape at the input to a process or to provide a quality check to determine size or shape at the output of a process. Measurement requires cross-sectional tools to calculate values such as width, height, angle, area or compare to golden profiles.

Inspection for examining part surfaces to identify flaws. Smart 3D sensors such as Gocator (our latest innovation), self-trigger to scan whole parts (built from a series of cross-section profiles), then ori-

ent scans to a golden template and perform part surface comparisons to identify manufacturing flaws.

Error proofing to monitor tool wear and position involved in part manufacturing. Tools that pierce, drill, insert, or remove material degrade over time. With 3D monitoring of tool tip position or shape, maintenance can intervene to prevent part non-conformance.

LMI, being OEM supplier of customized solution for many many years could be considered a true "hidden champion". Recently, however, with the Gocator product line you also started offering end customer products. Is this a paradigm change for the company?

T. Arden: This is a good question. Thank you for recognizing our years of experience and position in the market place for 3D technology.

The Gocator is not a paradigm shift. It is taking all of our product and application experience and applying it towards factory automation – an end user market that demands simplicity for success. The main shift, if you want to call it that, is to make this an accessible and versatile 3D sensor for all users from the factory floor technician through to the system integrators and equipment manufacturers.

What the Gocator specifically targets is to create a great user experience. All too often, companies think their mission is to deliver technology and they often guess at customer pains and needs. What people really want, I believe, is to purchase a result or experience that technology helps us deliver based on identifying

