

Trends in computer vision

In early December 2015, Jaap van de Loosdrecht delivered his inaugural lecture as professor of Computer Vision at the NHL University of Applied Sciences in Leeuwarden, the Netherlands. He discussed a number of developments/trends in computer vision:

- Product quality demands becoming ever more stringent.
- Costs decreasing, enabling low-budget computer vision solutions.
- Inspections requiring more 3D instead of 2D measurements and increasingly involving multi-spectral analysis.
- Form factor reduction enabling more vision applications in mobile devices.
- New sector-transgressing applications emerging, such as integral security, smart farming, serious gaming, multi-media, care & well-being and unmanned aerial vehicles (UAVs)/drones.
- Sensor fusion, the use of cameras in combination with other sensors, being on the rise.
- Complex quality control calling for data

science (processing big data into sensible information for improving products and services).

- The increase of image resolution and algorithmic complexity demanding for additional processor capacity.



■ Professor Jaap van de Loosdrecht delivering his inaugural lecture.

The NHL Centre of Expertise in Computer Vision conducts research in these subjects. One example is the "Smart Vision for UAVs" RAAK-project. (RAAK is a Dutch government funding programme for applied research projects; it stands for Regional Attention and Action for Knowledge Circulation.) Twelve SME companies and three research institutes, including the NLR (Netherlands Aerospace Centre), are participating in this NHL Computer Vision project. Practical applications that can be explored include wind turbine inspection, fire detection, aerial survey and inspection of small waterways.

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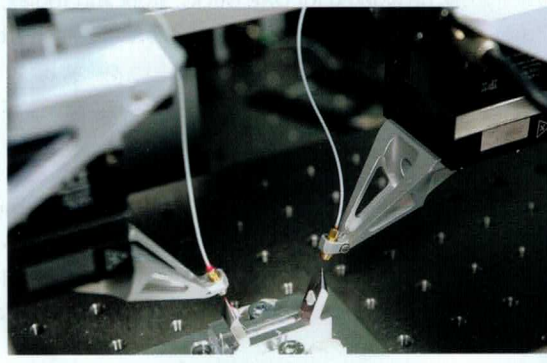
Simultaneous testing of optical components in silicon photonics

Although the test procedure for silicon photonics components is essentially the same as for the familiar electrical process, it is nevertheless more sophisticated as far as precision is concerned. The testing process requires an optical fiber to be adjusted with an accuracy of only a few tenths of a nanometer for each individual input and output. If the alignment process is sequential, it quickly becomes uneconomical due to the time factor. As a result, a solution is required for a simultaneous alignment process on the input and output side that shortens the test duration of the components.

high scanning velocity and are able to perform alignment in several degrees of freedom – simultaneously at the input and output. The travel ranges along the X, Y and Z axis are 25 mm for initial alignment of the fibers and 100 µm for the position-controlled scan. PI's modular E-712 motion controller platform with integrated alignment routines serves as controller, which was specially adapted for this task and can control six motorised and six piezo actuator axes.

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In a demonstration set-up, PI (Physik Instrumente) has shown how fast and precise XYZ stages are able to achieve parallel fiber alignment on the input and output side. For demonstration purposes, a waveguide integrated in the wafer is simulated by a single-mode fiber. Fibers with lenses are coupled at the fiber ends via precision piezo-based XYZ stages, such as PI's NanoCube® XYZ system. The positioning systems have a



■ Demonstration set-up for component testing with two multi-axis position systems for simultaneous fiber alignment.

Pratt & Whitney – KMWE agreement

Pratt & Whitney, a United Technologies Corp. company, and KMWE / DutchAero have signed a long-term contract to manufacture F135 engine components. The F135 engine is the propulsion system for the fifth generation F-35 Lightning II aircraft. Located in Eindhoven, the Netherlands, precision component manufacturer KMWE, together with its subsidiary DutchAero, has received a 10-year procurement agreement for machined engine components. This agreement signals a strengthened relationship between Pratt & Whitney and KMWE / DutchAero and positions KMWE / DutchAero well for follow-on F135 opportunities.

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