LIDAR for industrial applications

MSc project
at the
Gisela and Erwin Sick Laboratory of Micro-optics

LIDAR technology, sometimes referred to as "optical radar", is now widely used for distance measurement, in applications ranging from high-resolution medical diagnostics to long-range sensing for autonomous vehicles.

Increasing the utility of LIDAR for a greater range of industrial applications, however, requires designing and optimizing LIDAR technology to achieve:

- measurement ranges between a few tens of centimeters up to three meters;
- range resolutions below one millimeter;
- measurement rates above one million per second; and
- realization using low-cost technologies.

In close collaboration with Cognex in Freiburg, one of the world's industrial leaders in machine vision (www.cognex.com), we are offering an MSc project with the goal of realizing a proof-of-concept for a FMCW (frequency-modulated continuous-wave) LIDAR system which fulfills these requirements.

The project involves the incorporation of a swept laser source into an interferometer with the development of the associated data acquisition techniques for demonstration of a complete LIDAR system. The tasks include optical design, assembly and measurement, using state-of-the-art optical components as well as application of techniques for high-speed data analysis. The project will take place in a joint industrial/university environment with our partner Cognex.

Intrigued? Send email to zappe@imtek.uni-freiburg.de.