Measurement, monitoring and testing; new concepts and configurations:

OpenLidar in action -
Integrating a scanner module into a robust lidar in a national funded research project

I. Würth[a], A. Clifton[b], F. Haizmann[a], J. F. Newman[b], S. Raach[a] and N. Vasiljevic[c]

To enable collaboration across the worldwide wind lidar community, the initiative OpenLidar has been proposed by a team of researchers. OpenLidar creates a platform for the open-source design, construction, and operation of wind lidar devices, and enables the exchange of experience in developing of lidar devices within the community. OpenLidar is a combination of a modular lidar architecture (Figure 1), guidelines for documenting modules and their interfaces, and a user-edited website for documentation and software (www.openlidar.net).
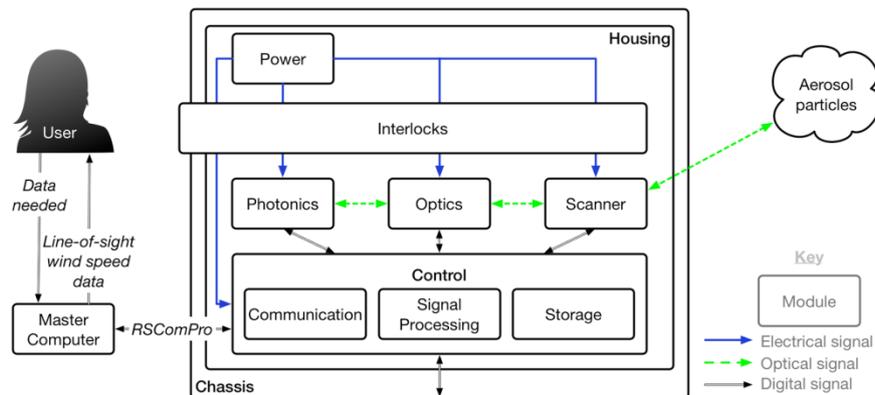

Figure 1: The OpenLidar modular architecture enables collaboration and experimentation.

The OpenLidar system architecture is not intended to be rigid or prescriptive. Instead, the use of modules with defined interfaces is similar to existing lidar designs and allows different groups to collaborate around the design and integration of different modules and technologies. As new modules developed under OpenLidar will have clear interfaces, and power, data, and safety requirements, participants in OpenLidar can customize modules or design new modules knowing that they will work with other modules designed for OpenLidar, or integrate modules to create a lidar for specific use cases. OpenLidar facilitates collaboration and experimentation, and reduces the learning curve involved with developing new lidar designs.

OpenLidar follows a four-stage plan. An initial high-level system architecture and collaboration website has been created. In the near future, we hope that participants will start detailed design work on individual modules. The last two stages include building hardware demonstrators and the mass customization of the modules. The goal at this stage is to get researchers involved in the project. It is clear that work can only be done with new funding or if OpenLidar can be applied to existing and new research projects.

This presentation introduces the OpenLidar initiative and shows how OpenLidar will support the creation of a rugged and compact lidar as part of the German national funded research project ANWIND. In this project, the University of Stuttgart (SWE) will enhance their existing scanner and combine it with the robust Whirlwind lidar, supplied by OpticSense GmbH, a spin-off from the University of Oldenburg. We will apply OpenLidar concepts and terminology such as the modular architecture, the definition of interfaces, the open source documentation of development results, and explore practical issues such as intellectual property rights. These insights will help refine OpenLidar, and show other lidar developers and users the benefits of integrating OpenLidar concepts into their work.

---

[a] Stuttgart Wind Energy @ Institute of Aircraft Design, University of Stuttgart, Germany

[b] National Renewable Energy Laboratory, USA

[c] Danish Technical University, Denmark