State of the art of lidar imaging for autonomous vehicles

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All types of autonomous vehicles have been proposed in the late times, for almost any type of transportation modality. The increase in safety and the push forward of novel models of mobility are turning vehicles into robotic (automobiles, railway, boats…). Such a trend implies additional sensing capabilities on board, which brings on constraints regarding size, cost and performance of the sensors. Lidar imagers are on the spot, as far as there is now a general agreement on the need of a 3D sensor with depth perception to complement cameras and radars in a data fusion environment. In this lecture we will overview the main aspects to be considered in a lidar imager, starting from the typical specifications of sensing in an autonomous vehicle, the different components and measurement strategies involved, and an overlook at which are the key components being used. It will be explained how the limitation and why combining all specifications with the needs of the application ends up being so complex. Some of the approaches known will be discussed, and examples of performance of lidar imagers will be also presented .

Biography

Santiago Royo, PhD, is currently professor at UPC and VP of Business Development of Beamagine S.L (2016, Barcelona), a company devoted to the development and commercialization of novel 3D electrooptic vision systems based on lidar imaging. He is co-founder of two more photonics-based spin-off companies: SnellOptics (2002, Terrassa, Spain), devoted to marketing quality plastic optical components; and ObsTechSpA (2012, Santiago, Chile) commercializing systems for internet-controlled telescopes. He holds 17 patents, 11of them licensed to four different companies, and over 50 refereed publications. He has been Director of the Center for Sensor, Instruments and System Development (CD6), a research and innovation center in Optical Engineeringin Greater Barcelona for the last 10 years, and has participated and led research projects involving different optical metrology techniques for the last 20 years. He is also member of the Board of Stakeholders of Photonics21, and co-secretary of the Spanish Platform for Photonics Fotónica21.

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