

Special Section Guest Editorial: MEMS Lidar

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Lidar has been considered to be one of the key enablers of the Advanced Driver Assistance System for autonomous self-driving cars. In contrast to lidar systems for industrial and science applications, automotive lidar, as a consumer product, faces various challenges, including a large field of view and beam area product (etendue) and reliability as part of a system that ensures safety. MEMS mirrors and those variants are key components for such reliable lidar being implemented in a quasi-solid-state manner. In this special section, we have six papers, including one invited to give an overview of the state of the art of the MEMS devices for lidar in aspects of lidar systems, devices, and processes. [Spector](#) gives an overview of research on an optics-assisted beam-steering system. [Burkard et al.](#) give an overview of statistical aspects of MEMS lidar employing SPAD. [Sandner et al.](#) report on a large aperture MEMS scanner system which is essential to support large etendue in lidar transmitter and receiver. [Ruotsalainen et al.](#) report on a MEMS mirror device employing AIN films. Robustness of MEMS lidar is reported by [Yoo et al.](#) Finally, enhancement of lidar signal by Ge/BaF₂ thin film stack is reported by [Gill et al.](#) As the diversity of topics covered in this special section shows, MEMS lidar involves not only MEMS mirrors but also a variety of aspects in system, device, and fabrication process. Hope this section stimulates and fosters collaborations among researchers in those fields. Finally, I am thankful to Editor-in-Chief Prof. Hans Zappe for his continuous support of the special section.

Yuzuru Takashima is an associate professor at James C. Wyant College of Optical Sciences at the University of Arizona. His research focus is MEMS-based lidar for automobiles and AR displays for Metaverse, as well as optical design in general, including space optics. Prior to joining to the University of Arizona, he was a research staff member at Stanford University, where he conducted research and development of high density holographic data storage systems and nanophotonic electron beam generators. He was employed as an optical engineer at Toshiba Corporation in Japan and developed ultra-precision manufacturing process for optical components. He is a senior member of Optica and SPIE, serving as a co-chair of a conference, Industrial Optical Systems and Devices (iODS). He received his BS in physics from Kyoto University in Japan, and his MS and PhD in electrical engineering from Stanford University.