Precision Measurements with Integrated Optics
### OSSC Combined In-Person & Webinar Event
"Range-Compensating Lens: Application to LIDARs"
By Adam Phenis, MS, CEO, Amp Optics, LLC, and
Jason Mudge, PhD, Principal, Golden Gate Light Optimization, LLC

Abstract: A range-compensating lens (RCL) design used in the return channel for active optical sensors, e.g., range-finders and LiDARs, has been developed by Mudge [Appl. Opt., 58(28), 7921-7928, (2019)]
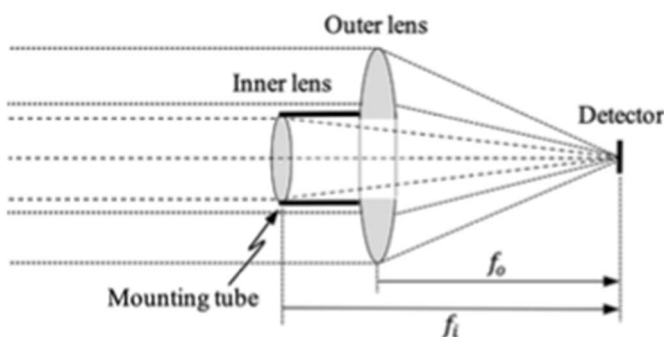
and detailed using raytrace methods by Phenis et al. [Proc. of SPIE, 11125(111250J), (2019)]. The motivation of the lens is to reduce the return signal with targets (objects) relatively near and boost the signal at far range targets by combining lens elements in parallel rather than in series. Using the techniques provided, a designer can develop a lens requiring a detector with less dynamic range and/or extend the far range limit while maintaining the minimum target distance. We provide designs of a two-element RCL, implementation, and a comparison with experimental results. With this foundational step, further flatting of the return signal curve as a function of range can now be done utilizing a three- or multi-element RCL design. This presentation will go into analysis details to analytically design a LiDAR sensor using an RCL to flatten the signal return with respect to range. Further details on the techniques of the optical design modeling will be presented.

About our speakers

Adam Phenis, MS, is the CEO of AMP Optics, LLC with nearly two decades of optical design and analysis experience throughout the optical spectrum (UV through VLWIR). He graduated from the University of California, Davis with a B.S. in Optical Science and Engineering and M.S. from The University of Arizona's James C. Wyant College of Optical Sciences. His expertise lies in making optical systems across a wide variety of applications perform. He has specific experience in the IR with respect to designing and building these optical systems and getting into the fine details to ensure that the systems that he works on are successful. He started his career at Lockheed Martin's Advanced Technology Center in Palo Alto, CA and has worked at various companies on optical systems ranging from LiDAR, IR, free space optical communications, defense, aerospace, and semiconductor. He currently serves as the task force leader of ASC OP TF6 Infrared Materials and SPIE IR Materials Working Group, a Director of OEOSC, and Convener for ISO TC172 SC3 WG2 Coatings. Adam is an SPIE Senior Member (2018).

Dr. Jason Mudge is a principal at Golden Gate Light Optimization, LLC an optical science consulting company located in San Francisco, CA – the heart of Silicon Valley. He has attended Foothill College (AS), University of California, Davis (BS & PhD), Stanford University (MS) and the University of Arizona's James C. Wyant College of Optical Sciences (MS). Jason began his career at Lockheed Martin's Advanced Technology Center in Palo Alto, CA. His expertise lies in optical sensor-level performance simulation, analysis, and data processing. Dr. Mudge has over 25 publications on topics ranging from imaging polarimetry to LiDAR to image quality and currently holds 4 utility patents. He is an SPIE Senior Member (2021).

Registration and Details for Attendance Below.

OSSC Event Wednesday, Oct 12, 2022
Reception: 6:00; Dinner 7:00, Presentation 8:00
Registration Required: http://www.ossc.org
Online Session Open: 7:30 (Zoom link provided on day of meeting)
Online Registration Closes October 11, 2022

	By Oct 7	By Oct 8
Zoom or no Meal	**Free**	**Free**
Students	**$10**	**$30**
Members	**$30**	**$40**
Non-Members	**$40**	**$50**

Max Capacity for the In-Person Attendance is 40.
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