PROCEEDINGS OF SPIE

Advanced Photon Counting Techniques XV

Mark A. Itzler
Joshua C. Bienfang
K. Alex McIntosh
Editors

12–16 April 2021
Online Only, United States

Sponsored and Published by
SPIE

Volume 11721

Proceedings of SPIE 0277-786X, V. 11721

SPIE is an international society advancing an interdisciplinary approach to the science and application of light.

Advanced Photon Counting Techniques XV, edited by Mark A. Itzler, Joshua C. Bienfang,
K. Alex McIntosh, Proc. of SPIE Vol. 11721, 1172101 · © 2021 SPIE
CCC code: 0277-786X/21/$21 · doi: 10.1117/12.2598684

The papers in this volume were part of the technical conference cited on the cover and title page. Papers were selected and subject to review by the editors and conference program committee. Some conference presentations may not be available for publication. Additional papers and presentation recordings may be available online in the SPIE Digital Library at SPIEDigitalLibrary.org.

The papers reflect the work and thoughts of the authors and are published herein as submitted. The publisher is not responsible for the validity of the information or for any outcomes resulting from reliance thereon.

Please use the following format to cite material from these proceedings:
Author(s), "Title of Paper," in *Advanced Photon Counting Techniques XV*, edited by Mark A. Itzler, Joshua C. Bienfang, K. Alex McIntosh, Proc. of SPIE 11721, Seven-digit Article CID Number (DD/MM/YYYY); (DOI URL).

ISSN: 0277-786X
ISSN: 1996-756X (electronic)

ISBN: 9781510642799
ISBN: 9781510642805 (electronic)

Published by
SPIE
P.O. Box 10, Bellingham, Washington 98227-0010 USA
Telephone +1 360 676 3290 (Pacific Time)
SPIE.org
Copyright © 2021 Society of Photo-Optical Instrumentation Engineers (SPIE).

Copying of material in this book for internal or personal use, or for the internal or personal use of specific clients, beyond the fair use provisions granted by the U.S. Copyright Law is authorized by SPIE subject to payment of fees. To obtain permission to use and share articles in this volume, visit Copyright Clearance Center at copyright.com. Other copying for republication, resale, advertising or promotion, or any form of systematic or multiple reproduction of any material in this book is prohibited except with permission in writing from the publisher.

Printed in the United States of America by Curran Associates, Inc., under license from SPIE.

Publication of record for individual papers is online in the SPIE Digital Library.

SPIE. DIGITAL LIBRARY
SPIEDigitalLibrary.org

Paper Numbering: A unique citation identifier (CID) number is assigned to each article in the Proceedings of SPIE at the time of publication. Utilization of CIDs allows articles to be fully citable as soon as they are published online, and connects the same identifier to all online and print versions of the publication. SPIE uses a seven-digit CID article numbering system structured as follows:

- The first five digits correspond to the SPIE volume number.
- The last two digits indicate publication order within the volume using a Base 36 numbering system employing both numerals and letters. These two-number sets start with 00, 01, 02, 03, 04, 05, 06, 07, 08, 09, 0A, 0B ... 0Z, followed by 10-1Z, 20-2Z, etc. The CID Number appears on each page of the manuscript.

Contents

SINGLE-PHOTON IMAGING & SYSTEMS

11721 05 **High-speed vision with a 3D-stacked SPAD image sensor (Invited Paper)** [11721-2]

11721 06 **Sub-pixel micro scanning for improved spatial resolution using single-photon LiDAR (Invited Paper)** [11721-3]

SINGLE-PHOTON DETECTOR READOUT AND INSTRUMENTATION

11721 09 **An integrated 256 channel TCSPC camera with sub-70ps single photon timing per channel** [11721-6]

11721 0A **Distributed and dynamic routing logic for high-speed data extraction from single photon avalanche diode arrays** [11721-7]

11721 0B **Fast time-correlated single photon counting system to overcome pile-up limitation with single photon avalanche diodes** [11721-8]

11721 0C **Tests of systematic effects in an n-channel FPGA time-to-digital converter for continuous acquisition with high photon count rate using correlation measurements** [11721-9]

SINGLE-PHOTON AVALANCHE DIODE DEVELOPMENT AND APPLICATIONS

11721 0O **Modeling and verification of capacitive quenching in a single photon avalanche diode (Invited Paper)** [11721-20]

11721 0Q **Evaluation of asynchronous geiger-mode avalanche photodiode arrays for deep-space optical communications (Invited Paper)** [11721-22]

11721 0T **Correction of time-resolved SPAD array measurements for accurate single-photon time-resolved biological imaging (Invited Paper)** [11721-25]