

*Medical Imaging 2023*

---

# ***Imaging Informatics for Healthcare, Research, and Applications***

**Brian J. Park**  
**Hiroyuki Yoshida**  
*Editors*

**19–21 February 2023**  
**San Diego, California, United States**

*Sponsored by*  
SPIE

*Cooperating Organizations*  
American Association of Physicists in Medicine (United States)  
Radiological Society of North America  
World Molecular Imaging Society  
Society for Imaging Informatics in Medicine (United States)  
International Foundation for Computer Assisted Radiology and Surgery  
Medical Image Perception Society (United States)

*Published by*  
SPIE

**Volume 12469**

Proceedings of SPIE, 1605-7422, V. 12469

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

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 [SPIDigitalLibrary.org](http://SPIDigitalLibrary.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 *Medical Imaging 2023: Imaging Informatics for Healthcare, Research, and Applications*, edited by Brian J. Park, Hiroyuki Yoshida, Proc. of SPIE 12469, Seven-digit Article CID Number (DD/MM/YYYY); (DOI URL).

ISSN: 1605-7422

ISSN: 2410-9045 (electronic)

ISBN: 9781510660434

ISBN: 9781510660441 (electronic)

Published by

**SPIE**

P.O. Box 10, Bellingham, Washington 98227-0010 USA

Telephone +1 360 676 3290 (Pacific Time)

[SPIE.org](http://SPIE.org)

Copyright © 2023 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](http://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**

[SPIDigitalLibrary.org](http://SPIDigitalLibrary.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

vii *Conference Committee*

---

## AI MODELS AND PLATFORMS

---

- 12469 04 **User experience evaluation for MIDRC AI interface** [12469-2]
- 12469 05 **Mendability index: a new metric for estimating the effort required for manually editing auto-segmentations of objects of interest** [12469-3]
- 12469 06 **Utilizing data mining and deep learning methods on retrospective head and neck radiation therapy cases for decision support of individualized treatment planning** [12469-4]

---

## AI BIASES AND DATA SECURITIES

---

- 12469 08 **A robust two-step adversarial debiasing with partial learning: medical image case studies** [12469-6]
- 12469 09 **Sequestration methodology in practice through evaluation of joint demographic distributions of 54,185 patients in the Medical Imaging and Data Resource Center (MIDRC) data commons** [12469-7]
- 12469 0A **Anonymization and validation of 3-dimensional volumetric renderings of Computed Tomography (CT) data using commercially available T1W MRI-based algorithms** [12469-8]
- 12469 0B **A standard informatics system and workflow to standardize DICOM data preprocessing at scale** [12469-9]

---

## MULTIMEDIA DATA AND HYBRID SYSTEMS

---

- 12469 0C **Video health monitoring for cardiac arrhythmia detection in a real hospital scenario** [12469-10]
- 12469 0D **Respiration extraction and atrial fibrillation detection from clinical data based on single RGB camera** [12469-11]
- 12469 0E **Reliability estimation of armchair-based capacitive ECG using video-based pose estimation** [12469-12]
- 12469 0F **Development of decision support tools for biomechanics research utilizing the Integrated Biomechanics Informatics System (IBIS)** [12469-13]
- 12469 0G **Development of information system on occupational exposure** [12469-14]

12469 OH **A hybrid framework of traditional and deep learning segmentation methods with feature detection for Optical Coherence Tomography (OCT) images** [12469-15]

---

#### **AUGMENTED REALITY AND THE DIGITAL OPERATING ROOM**

---

12469 OJ **Comparison of video capture cards for streaming real-time procedural imaging onto mixed reality headset** [12469-17]

12469 OK **A proposal for communication of intraoperative contextual information via DICOM unified procedure steps** [12469-18]

---

#### **RADIOMICS**

---

12469 OL **A pipeline for multivariate genome-wide associations studies with morphological brain features** [12469-19]

12469 OM **Predicting left/right lung volumes, thoracic cavity volume, and heart volume from subject demographics to improve lung transplant** [12469-21]

12469 ON **Deep-learning-based end-to-end scan-type classification, pre-processing, and segmentation of clinical neuro-oncology studies** [12469-22]

---

#### **RADIOLOGY REPORTING**

---

12469 OO **Radiology report generation using transformers conditioned with non-imaging data** [12469-23]

12469 OP **A generative-discriminative deep learning approach to classify radiology reports based on the presence of follow up recommendations** [12469-24]

---

#### **POSTER SESSION**

---

12469 OQ **Three-dimensional video of facial surface synchronized with videofluoroscopic swallowing study** [12469-25]

12469 OR **Machine-learning-based bpMRI radiomics for differentiation of prostate cancer in PSA gray zone cases** [12469-26]

12469 OS **Integrating deep learning algorithms for the lung segmentation and body-part-specific anatomical classification with Medical Imaging and Data Resource Center (MIDRC)** [12469-27]

12469 OT **Automated detection of colorectal polyps in photon-counting CT colonography (Cum Laude Poster Award)** [12469-29]

- 12469 0U     **Electronic cleansing in photon-counting CT colonography by use of self-supervised 3D-GAN**  
[12469-30]
- 12469 0V     **Video-based in-vehicle action recognition for continuous health monitoring** [12469-31]
- 12469 0W     **A web-based radiomics module for image feature extraction for tumor characterization**  
[12469-32]

---

**DIGITAL POSTER SESSION**

---

- 12469 0X     **Micro-nodule analysis by severity of pneumoconiosis using 3D CT images.** [12469-20]