International Conference on Precision Engineering and Mechanical Manufacturing (PEMM 2024)

Steven Y. Liang Editor

1–3 August 2024 Incheon, Korea, Republic of

Organized by Science and Engineering Institute (Hong Kong, China)

Sponsored by Inha University, Incheon (Korea, Republic of) Georgia Institute of Technology (United States)

Published by SPIE

Volume 13285

Proceedings of SPIE 0277-786X, V. 13285

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 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 International Conference on Precision Engineering and Mechanical Manufacturing (PEMM 2024), edited by Steven Y. Liang, Proc. of SPIE 13285, Seven-digit Article CID Number (DD/MM/YYYY); (DOI URL).

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

ISBN: 9781510683129 ISBN: 9781510683136 (electronic)

Published by **SPIE** P.O. Box 10, Bellingham, Washington 98227-0010 USA Telephone +1 360 676 3290 (Pacific Time) SPIE.org Copyright © 2024 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.



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

v Conference Committee

MECHANICAL SYSTEM DESIGN AND RELIABILITY ANALYSIS

- 13285 02 Performance analysis of ducted-fan modules with axial impeller [13285-8]
- 13285 03 Reliability analysis of harmonic gear drive flexspline considering bending fatigue [13285-9]
- 13285 04 Mechanical design and analysis of cable-driven wearable flexible exoskeleton system [13285-20]
- 13285 05 A novel design of compliant bearing for precise linear-rotary positioning systems [13285-21]

SIMULATION AND OPTIMIZATION OF PRECISION MANUFACTURING PROCESS

- 13285 06 Design and simulation optimization of temperature uniformity for well type muffle free heat treatment furnace [13285-3]
- 13285 07 Tensile behaviour prediction of laser powder bed fusion with engineered process parameters using a feedforward neural network [13285-5]
- 13285 08 Analyzing the influence of mesh reduction on CAD model precision in geometric reverse engineering of cylindrical components [13285-6]
- 13285 09 CFD simulation of drying rice paddy in a deep-bed dryer with inclined false floor [13285-13]
- 13285 0A Improved design of dentist's ergonomic chair using finite element simulation to prevent musculoskeletal disorders [13285-18]
- 13285 0B New high-speed precise shearing method of hard-to-cut metal bars with stress concentration [13285-22]

PREPARATION, PROCESSING, AND PROPERTIES OF ADVANCED MATERIALS

- 13285 OC Roll casting of Al-Mg alloy with impurity using vertical type high speed twin roll caster equipped with steel rolls [13285-2]
- 13285 0D Mechanical behavior of UV/O₃ treated tapioca-reinforced polylactic acid (PLA) biocomposites [13285-10]

13285 OE	Analysis of mechanical and physical properties of oil palm shell-reinforced aluminium chips-based composite via hot press forging [13285-11]
13285 OF	Advancing sustainable construction: a comparative analysis of wooden and steel chassis through FEA [13285-14]
13285 0G	Analysis of hardness and residual stresses in high temperature heat treated commercially pure grade 2 titanium alloy plates [13285-15]
13285 OH	Optimizing mechanical properties of synthetic bone implants via three-dimensional printing with PLA/PBS/HA blends: a mixture design approach [13285-16]
13285 OI	Carbon-doped MoS ₂ for ultraviolet (UV) photodetector device [13285-25]

INTERNAL COMBUSTION ENGINE TECHNOLOGY AND THE PERFORMANCE ANALYSIS

- 13285 0J Practical use of ferrography for determining the technical condition of an internal combustion engine [13285-4]
- 13285 0K Effects of load on noise emission level generated by diesel engine including biodiesel application [13285-17]