

MATHEMATICAL  
MONOGRAPHS

7

2014

# Mathematics and Computer Science

Proceedings  
of Annual Workshop  
on Mathematics  
and Computer Science

March 25, 2014  
JOSAI UNIVERSITY

Edited by  
Masatoshi IIDA  
Manabu INUMA  
Kiyoko NISHIZAWA



JOSAI UNIVERSITY  
GRADUATE SCHOOL OF SCIENCE

---

---

## List of Special Issues

SCIENCE BULLETIN OF JOSAI UNIVERSITY

- No.1 Convexity, Chaos and Fractals**  
Proceedings of the Symposium on Nonlinear Analysis (NLA96), Spring 1996
- No.2 Surgery and Geometric Topology**  
Proceedings of the Conference, September 1996
- No.3 Mathematics Applied to Economics and Finance**  
Proceedings of the International Conference, February 1997
- No.4 Complex Dynamical Systems**  
Proceedings of the Symposium on Non-Linear Analysis (NLA97), May 1997
- No.5 Wavelet, Chaos and Nonlinear PDEs**  
Proceedings of the Symposium on Applied Mathematics, September 1997

## JOSAI MATHEMATICAL MONOGRAPHS

- JMM 1. CONVEX ANALYSIS AND CHAOS**  
Proceedings of the Symposium on Nonlinear Analysis (NLA98), July 1998  
Kiyoko NISHIZAWA, editor
- JMM 2. COMPUTER ALGEBRA**  
Proceedings of the Symposium on Nonlinear Analysis (NLA99), September 1999  
Kiyoko NISHIZAWA, Chair and Editor
- JMM 3. DIFFERENTIAL GEOMETRY**  
Proceedings of the Symposium on Differential Geometry, February 2001  
Qing-Ming CHENG, editor
- JMM 4. AN ALGORITHMIC STUDY ON BASIC PLANNING PROBLEMS IN OPERATIONS RESEARCH**  
Kakuzo IWAMURA
- JMM 5. TEICHMÜLLER SPACE AND RELATED TOPICS**  
Proceedings of the Workshop on Geometry, January 2011  
Kiyoko NISHIZAWA, editor
- JMM 6. REPRESENTATION THEORY OF ALGEBRAIC GROUPS AND RELATED TOPICS**  
Proceedings of the Workshop on Representation Theory, September 2012  
Masatoshi IIDA, Takeyoshi KOGISO, Haruko NISHI, editors
- JMM 7. MATHEMATICS AND COMPUTER SCIENCE**  
Proceedings of Annual Workshop on Mathematics and Computer Science, March 2014  
Masatoshi IIDA, Manabu INUMA, Kiyoko NISHIZAWA, editors

**JOSAI  
MATHEMATICAL  
MONOGRAPHS**

**7  
2014**

**Mathematics  
and  
Computer Science**

Proceedings  
of Annual Workshop  
on Mathematics  
and Computer Science

March 25, 2014  
JOSAI UNIVERSITY

Edited by  
Masatoshi IIDA  
Manabu INUMA  
Kiyoko NISHIZAWA

JOSAI UNIVERSITY  
GRADUATE SCHOOL OF SCIENCE  
Keyakidai 1-1, Sakado  
Saitama, Japan 350-0295

# JOSAI MATHEMATICAL MONOGRAPHS

---

## EDITOR – IN – CHIEF

KIYOKO NISHIZAWA

Graduate school of Science

Josai University

## EDITORIAL BOARD

MASATOSHI IIDA (Josai University)

TAKEYOSHI KOGISO (Josai University)

HARUKO NISHI (Josai University)

**JOSAI MATHEMATICAL MONOGRAPHS**  
**JMM 7.(2014) Mathematics and Computer Science**

PUBLISHED BY GRADUATE SCHOOL OF SCIENCE,  
JOSAI UNIVERSITY,  
SAKADO, SAITAMA, 350-0295 JAPAN  
TEL +81-492-71-7690(OFFICE)  
FAX +81-492-71-7685,7689

EDITORIAL BOARD

EDITOR-IN-CHIEF: KIYOKO NISHIZAWA (Josai University)  
EDITOR: MASATOSHI IIDA (Josai University)  
TAKEYOSHI KOGISO (Josai University)  
HARUKO NISHI (Josai University)

PRINTED BY GAITAME PRINTING CO., LTD.  
29-6, ASAKUSA 2-CHOME, TAITO-KU, TOKYO  
111-0032 JAPAN  
TEL 03-3844-3855

Copyright © 2014 Josai University  
All Rights Reserved

## JOSAI MATHEMATICAL MONOGRAPHS

### JMM 7. Mathematics and Computer Science, Manabu Inuma, Chair and Editor

*Annual Workshop on Mathematics and Computer Science  
held at Josai University on March 25 in 2014*

## Contents

<i>Preface</i> .....	iv
<i>Program</i> .....	v
<i>List of Participants</i> .....	vi
DAIGO MURAMATSU, YASUSHI MAKIHARA, AND YASUSHI YAGI, <i>Cross-View Gait Recognition Using View Transformation Framework</i> .....	3
SHIGEFUMI YAMADA AND TAKASHI SHINZAKI, <i>Evaluation of Independence between multiple fingerprints for Multibiometrics</i> .....	15
NARISHIGE ABE AND TAKASHI SHINZAKI, <i>A Survey on Newer Prospective Biometric Authentication Modalities</i> .....	25
HYUNHO KANG AND KEIICHI IWAMURA, <i>Digital Image Watermarking with Robust, Semifragile, and Fragile Properties</i> .....	41
MANABU INUMA, <i>A relation between irreversibility and unlinkability for biometric template protection algorithms</i> .....	55
FUMIHIKO YAMAGUCHI, <i>A Set Theoretical Semantics for a Subsystem of Linear Logic</i> .....	67
KOJI NUIDA, <i>A note on a two-dimensional integer sequence arised from a study of physical random number generation</i> .....	75
TAKENOBU SEITO, YOHEI WATANABE, KAZUYUKI KINOSE, AND JUNJI SHIKATA, <i>Information-Theoretically Secure Anonymous Group Authentication with Arbitration: Formal Definition and Construction</i> .....	85

---

---