

Nasir Ganikhodjaev
Farrukh Mukhamedov
Pah Chin Hee

VOLUME 1

$$x' = 2xy$$

$$y' = 2xz$$

INVESTIGATIONS ON PURE MATHEMATICS, FINANCE MATHEMATICS AND OPTICS

Proceedings of the Department of Computational
and Theoretical Sciences Kulliyah of Science, IIUM

$$\varphi_1(x, y, z) = z$$

$$\pi_1 = \begin{pmatrix} x & y & z \\ y & z & x \end{pmatrix}$$

$$z' = x^2 + y^2 + z^2 + 2yz$$

$$\pi_1 \nu_1 \pi_1 = \nu_{17}$$



الجامعة الإسلامية العالمية ماليزيا
INTERNATIONAL ISLAMIC UNIVERSITY MALAYSIA
يُونَيْتِي سَلَامًا اِنْتَارَا اِنْعَسَابًا مَلَيْسِيَا

Investigations on Pure Mathematics, Finance Mathematics and Optics

Nasir Ganikhodjaev
Farrukh Mukhamedov
Pah Chin Hee



IIUM Press

Published by.
IIUM Press
International Islamic University Malaysia

First Edition, 2011
©IIUM Press, IIUM

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without any prior written permission of the publisher.

Perpustakaan Negara Malaysia

Cataloguing-in-Publication Data

Nasir Ganikhodjaev, Farrukh Mukhamedov & Pah Chin Hee. Investigations on Pure Mathematics, Finance Mathematics and Optics

ISBN: 978-967-418-198-7

Member of Majlis Penerbitan Ilmiah Malaysia – MAPIM
(Malaysian Scholarly Publishing Council)

Printed by
IIUM PRINTING SDN.BHD.
No 1, Jalan Industri Batu Caves 1/3
Taman Perindustrian Batu Caves
Batu Caves Centre Point
68100 Batu Caves
Selangor Darul Ehsan

Contents

Preface

Part I Pure Mathematics Concentration

| | | |
|------------|--|-----|
| Chapter 1 | THE BEHAVIOR OF TRAJECTORY OF ξ^s QUADRATIC STOCHASTIC OPERATIONS | 2 |
| Chapter 2 | THEORY OF MARKOV CHAINS IN PEDIATRIC DISEASES | 8 |
| Chapter 3 | ON NONLINEAR DYNAMIC SYSTEMS ARISING IN POTTS MODEL | 14 |
| Chapter 4 | THE FIRST RETURN TIME AND DIMENSION | 22 |
| Chapter 5 | ON AS SOCIATIVE ALGEBRAIC STRUCTURE OF GENETIC INHERITANCE | 31 |
| Chapter 6 | INTERACTING PARTICLE SYSTEM | 37 |
| Chapter 7 | DYNAMICS OF GENERALIZED LOGISTIC MAPS | 43 |
| Chapter 8 | GEOMETRIC BROWNIAN MOTION AND CALCULATION OF OPTION PREMIUM IN BLACK-SCHOLES MODEL | 50 |
| Chapter 9 | ON THE ELEMENTARY CHARACTERIZATION OF PRIMES IN PRIMALITY TESTS: TWO SHORT STUDIES. | 57 |
| Chapter 10 | ON ASSOCIATIVE ALGEBRAIC STRUCTURE OF GENETIC INHERITANCE | 64 |
| Chapter 11 | SOME APPLICATION OF ERGODIC THEORY IN NUMBER THEORY | 70 |
| Chapter 12 | STUDY OF ROLES OF EXTERNAL MAGNETIC FIELD ON ISING AND POTTS MODEL | 76 |
| Chapter 13 | INVESTIGATION OF STABILITY OF FIXED POINTS OF NONLINEAR DISCRETE DYNAMICAL SYSTEMS | 82 |
| Chapter 14 | MARKOV CHAINS AND ITS APPLICATION: THE INVENTORY MODEL | 90 |
| Chapter 15 | PHASE TRANSITION FOR ISING MODEL WITH TWO COMPETING INTERACTION ON CAYLEY TREE OF ORDER 4 | 96 |
| Chapter 16 | LIMIT BEHAVIOR OF DYNAMIC SYSTEMS CORRESPONDING TO LATTICE MODELS WITH COMPETING PROLONGED AND ONE-LEVEL BINARY INTERACTIONS | 101 |
| Chapter 17 | ASSOCIATIVE ALGEBRA IN GENETIC INHERITANCE | 109 |
| Chapter 18 | ON ξ^a -QUADRATIC STOCHASTIC OPERATORS AND THEIR CLASSIFICATIONS | 115 |

Part II Finance Mathematics Concentration

| | | |
|------------|--|-----|
| Chapter 19 | ANALYZING THE PERFORMANCE OF INVESTMENT STRATEGY OF EPF | 123 |
| Chapter 20 | PREDICTION OF STOCK PRICE USING NEURAL NETWORK | 130 |
| Chapter 21 | COMPARISON BETWEEN CONVENTIONAL AND ISLAMIC BOND IN MALAYSIA | 136 |
| Chapter 22 | STOCK PERFORMANCE ANALYSIS BETWEEN MALAYSIAN AIRLINES SYSTEM BERHAD AND AIRASIA BERHAD | 144 |
| Chapter 23 | ISLAMIC PAWNBROKING (AR-RAHNU) AS A MICRO CREDIT INSTRUMENT IN MALAYSIA | 151 |
| Chapter 24 | ANALYSIS OF CRUDE PALM OIL FUTURES PRICES TRADED ON BURSA MALAYSIA | 160 |
| Chapter 25 | AN EMPIRICAL STUDY ON THE EFFICIENCY OF THE TRIM AND FILL METHOD IN CORRECTING PUBLICATION BIAS IN META ANALYSIS | 166 |
| Chapter 26 | PERFORMANCE ANALYSIS OF INSURANCE AND TAKAFUL INDUSTRIES IN MALAYSIA | 171 |
| Chapter 27 | ANALYSIS OF DATA USING MULTILEVEL MODELLING WITH MLwiN | 179 |
| Chapter 28 | FINANCIAL PERFORMANCE OF ISLAMIC BANKING AND CONVENTIONAL BANKING IN MALAYSIA | 186 |
| Chapter 29 | A STUDY ON THE EFFECT OF PUBLICATION BIAS IN META ANALYSIS | 194 |
| Chapter 30 | RATIO ANALYSIS: BANK ISLAM MALAYSIA BERHAD (BIMB) & MALAYAN BANKING BERHAD (MAYBANK) | 201 |
| Chapter 31 | AN ANALYSIS OF MALAYSIAN UNIT TRUST FUNDS: ISLAMIC VS CONVENTIONAL | 207 |

Part III Optics Concentration

| | | |
|------------|---|-----|
| Chapter 32 | QUANTUM TRAJECTORY METHOD USING MPI PARALLEL COMPUTING | 214 |
| Chapter 33 | LINEAR WAVE PROPAGATION IN SINGLE MODE OPTICAL FIBRE | 220 |
| Chapter 34 | THE OPTICAL RAY TRACING TECHNIQUE IN LENS SYSTEM WITHIN AND BEYOND PARAXIAL APPROXIMATION | 226 |
| Chapter 35 | WAVE PROPAGATION IN NONLINEAR AND HOMOGENEOUS MEDIA: KERR MEDIA | 234 |
| Chapter 36 | MATRIX METHODS OF OPTICAL RESONATORS | 240 |