12th International Conference on Applied Physics and Mathematics (ICAPM 2022)

Journal of Physics: Conference Series Volume 2287

Singapore 18-20 February 2022

ISBN: 978-1-7138-5849-2

ISSN: 1742-6588

Printed from e-media with permission by:

Curran Associates, Inc. 57 Morehouse Lane Red Hook, NY 12571



Some format issues inherent in the e-media version may also appear in this print version.

This work is licensed under a Creative Commons Attribution 3.0 International Licence. Licence details: http://creativecommons.org/licenses/by/3.0/.

No changes have been made to the content of these proceedings. There may be changes to pagination and minor adjustments for aesthetics.

Printed with permission by Curran Associates, Inc. (2022)

For permission requests, please contact the Institute of Physics at the address below.

Institute of Physics Dirac House, Temple Back Bristol BS1 6BE UK

Phone: 44 1 17 929 7481 Fax: 44 1 17 920 0979

techtracking@iop.org

Additional copies of this publication are available from:

Curran Associates, Inc. 57 Morehouse Lane Red Hook, NY 12571 USA Phone: 845-758-0400

Fax: 845-758-2633

Email: curran@proceedings.com Web: www.proceedings.com

TABLE OF CONTENTS

Preface

Peer Review Statement

FIINDAN	IENTAI.	MATHEMATICS	AND (COMPIT	ΓΔΤΙΩΝ	JAT. MA	ATHEMA	TICS
T UNDAN	ILITAL	WIATHEWIATIOS	AID		IAIIO			

The Application of GAP Software in Constructing the Non-Normal Subgroup Graphs of	
Alternating Groups	1
A Markov Decision Process Framework for Optimal Cancer Chemotherapy Dose Selection	5
Some Generalizations of Random Broken and Pick-up Stick Problems	12
Application of the Chimera Method to Poisson's Equation with the Homogeneous Dirichlet Boundary Condition	22
Sanskruti Index of some Chemical Trees and Unicyclic Graphs	34
On Finite Subgroups in the General Linear Groups over an Algebraic Number Field	45
Application of WKB Method in Approximating Wave Functions in Square Potential Wells	61
A Direct Proof of the Prime Number Theorem using Riemann's Prime-counting Function	74
MATHEMATICAL MODEL AND CALCULATIONS	
Gradient-induced Model-free Variable Selection Based on Composite Quantile Regression in Reproducing Kernel Hilbert Space	82
A Stochastic Process for Music: The Example of K-pop Music	88
Drug Level Modelling with Difference and Differential Equations	93
Analysis of the Stability and Hopf Bifurcation of a Three-Dimensional System with Delays	101
Mathematical Model for Combined Radiotherapy and Chemotherapy that Fits with Experimental Data	117
Hoda Hellal, Hanaa Elabsy, Hesham Elkaranshawy	

Accelerated failure time models in analyzing duration of employment	124
Numerical Simulation Study of the Water Entry Slamming on Oscillating Buoys with Different Shapes	131
Xuejian Li, Xing Luo, Ruohong Wang, Yanjun Liu	131
Numerical Simulation Study and Analysis of Water Inrush from Floor Concealed Subsidence Column during Mining	149
MATHEMATICS AND ECONOMICS	
Prediction Method of Public Participation in Decision-making Based on Bayes Theorem	156
A Machine Learning Model for Healthcare Stocks Forecasting in the US Stock Market during COVID-19 Period	160
Prapatchon Jariyapan, Jittima Singvejsakul, Chukiat Chaiboonsri	
Deep Neural Network As a Tool for Appraising Housing Prices: A Case Study of Busan, South Korea	169
S An, Y Song, H Jang, K Ahn	107
Information Flow Between Crude Palm Oil and Crude Oil Futures	174
Equilibrium in Complete Market with Jump-Diffusion Processes	179
The Regional Expressions of Secular Stagnation	185
SOLID MECHANICS AND VIBRATION	
Simulation of Meshing of Herringbone Double Circular-Arc Helical Gears using Multibody Dynamic Analysis Software	202
C K Lee, C L Hsieh, J C Ruan, C Y Wang	
Simulation of 2D Acoustic Wave Propagation with Absorbing Boundary Condition	208
Power-based Model for Temperature Prediction in FSW	216
The Structural Design and Analysis of a Symmetrical Twin-tower Conjoined Building with Vibration Absorber	222
PHYSICS THEORY AND ANALYTICAL METHODS	
A Hybridizable Discontinuous Galerkin and Boundary Element coupling method for electromagnetic simulations	232

A Short Review of Deep Tissue Imaging Techniques and Applications	238
The Glauber Model And Flow Analysis with Pb-Pb Collisions at $\sqrt{s_{NN}}$ =2.76 TeV	248
Reconstruction, Analysis of the Process ggH Decay to llvv Monte Carlo with MH=125 GeV and Introduction of the Physical Background	256
Research on Physical Laws Behind Irreversible Cartesian Diver	266
ASTROPHYSICS AND SPACE PHYSICS	
Observing the Development of Two Solar Flares by Monitoring AR 12882 which Produces a Kp6 Geomagnetic Storm in October 2021	275
Moderate Radio Flux Density of Single and Group III Bursts from AR2887 Active Region on 26th October 2021	280
Z S Hamidi, L. Chen Chen, Z. K. D. Nurlisman	
An Analysis of the X1.59 Flare and Associated Events on 3rd July 2021	285
Effects of CME-induced Geomagnetic Storm on Geomagnetic Induced Current at High and Middle Latitudes	290
Research Progress Based on Gaia DR2 and the Comparison of the Gaia Proper Motions to the Galaxia Model of the Milky Way	297
A New Method to Reduce Near-Infrared Data of Palomar Observatory	306
Research on the Galaxy Rotation Model based on 21 cm Hydrogen Spectrum	316
Law of Gravity Blurred by Perturbed Planetary Orbits for Alien Observers	327
APPLIED MECHANICS AND ENGINEERING	
Meshing Simulation of Face-Gear Drives using Multibody Dynamics Software	337
A Survey of the Influence of Air Distribution on Indoor Environment and Building Energy Efficiency	343
A New Risk-based Excavation Inspection Decision-making for Long-distance Pipelines	354

Structural Design for Improving the Strength of Flat Wooden Pallets	364
Development of Particle-fluid Drag Model for Individual Wheat Straw Particle	370
Modelling of a Stilling Basins with Sloping Apron in IBER to Improve Efficiency in High-slope Rivers	380
A TIM-based Method of Automatic Generation of FE Models for Pit Engineering	393
Influence of the P-delta Effect and Stiffness Irregularity on the Structural Behavior of Reinforced Concrete Buildings	399

Author Index