

2024 31st National and 9th International Iranian Conference on Biomedical Engineering (ICBME 2024)

**Tehran, Iran
28-29 November 2024**



**IEEE Catalog Number: CFP2418K-POD
ISBN: 979-8-3315-2972-7**

**Copyright © 2024 by the Institute of Electrical and Electronics Engineers, Inc.
All Rights Reserved**

Copyright and Reprint Permissions: Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limit of U.S. copyright law for private use of patrons those articles in this volume that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

For other copying, reprint or republication permission, write to IEEE Copyrights Manager, IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854. All rights reserved.

****** This is a print representation of what appears in the IEEE Digital Library. Some format issues inherent in the e-media version may also appear in this print version.***

IEEE Catalog Number:	CFP2418K-POD
ISBN (Print-On-Demand):	979-8-3315-2972-7
ISBN (Online):	979-8-3315-2971-0

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
E-mail: curran@proceedings.com
Web: www.proceedings.com

CURRAN ASSOCIATES INC.
proceedings
.com

TABLE OF CONTENTS

Effect of Time Window on Static Balance Test Results of Children with Cerebral Palsy	1
<i>Mehrnaz Badrossamay, Farzam Farahmand, Mahya Shojaeefard</i>	
Convolutional Neural Network: Towards Pulmonary Emphysema Detection from Chest X-Ray Images	5
<i>Negin Amirzadeh, Seyed Omid Shahdi</i>	
Wrist Movement Rehabilitation in Hemiparetic Unilateral Cerebral Palsy Children Using Mechanical Stimulation of Skin Mechanoreceptors and Computer Game	13
<i>Sepehr Foroughi, Shahed Salehzehi, Mohammad Ebrahim Hashemi, Parisa Hosseini, Hamid Reza Kobravi, Narges Hashemi, Mehran Beiraghi Toosi, Javad Akhondian</i>	
EEGChain: An Open-Access EEGLAB-based Toolbox for Building, Managing, Automating, and Reproducing Batch EEG Processing Pipelines.....	20
<i>Fardin Afdideh, Mitra Boozari, Ali Ekhlasi, Ali Motie Nasrabadi</i>	
Investigating Effective Connectivity Within the Default Mode Network in Autism Spectrum Disorder: Insights from Dynamic Causal Modeling of Resting-State fMRI	28
<i>Soroor Shafieizadegan, Farzaneh Shayegh, Rassoul Amirfattahi Varnosfaderani</i>	
Characterization and Printability Study of 3D Printed Polyurethane/Polycaprolactone Using IP-3D Printing for Tendon and Ligament.....	36
<i>A. Doroudi, H. Mirzadeh, S. Bagheri-Khoulenjani, Soheil Dariushi</i>	
Effect of Side Channel Configuration of a T-Junction on Droplet Generation: A Computational Study.....	40
<i>Shahin Ataie, Ali Abouei Mehrizi</i>	
Redesign of the Biopsy Needle Notch Cross-Section to Reduce Deflection During Needle Insertion	46
<i>Mobina Zare, Sobhan Dehghan-Navaz, Yekta Ziaei, Nabiollah Abolfathi</i>	
Gelatin/carboxymethyl Carrageenan/halloysites Nanocomposite Bone Tissue Engineering Scaffolds with Enhanced Biomimetic Mineralization	52
<i>Samira Andam, Jhamak Nourmohammadi, Raheleh Mashhadi, Vahideh Mohammadi</i>	
Cardiac Ischemia Detection Using Self-Organizing Map Feature Selection Method.....	57
<i>Ramin Aghili Karampour, Amir Arshia Bakhtiar, Kiarash Hajizamani, Alireza Fallahi, Hamid Soltanian Zadeh</i>	
Improving ALS Diagnosis Based on Human EEG Signal Analysis with Machine Learning	63
<i>Ali Abedi, Gholamreza Moradi, Reza Sarraf Shirazi, Mehran Jahed</i>	
Musculoskeletal Risk Assessment and Interventions in a Lifting Task: A Comparison of Several Biomechanical and Ergonomic Tools.....	69
<i>Reza Khosrozadeh, Babak Tarivirdilouy Asl, Alireza Rouyin, Hamidreza Monjezi, Ali Roosta, Navid Arjmand</i>	
Musculoskeletal Disorders Risk Assessment Using Various Biomechanical and Ergonomics-Based Tools in an Automobile Fuel Tank Installation Workstation.....	77
<i>Ali Jamshidian, Yasamin Shahjavan, Asma Nadeali Jelokhani, Seyede Niloofar Hosseini, Navid Arjmand</i>	

Cell-Substrate Interactions: Finite Element Modeling of Cell Mechanical Responses to Micropillar Substrates	85
<i>Parmida Pourreza, Faezeh Eskandari, Fatemeh Atashgar, Mehdi Shafieian</i>	
Investigating the Effect of Al and Mg Dopedhydroxyapatite Coating on Improving the Corrosion Resistance of Mg Substrates for Implants Application.....	91
<i>H. Heydarinasab, F. Haj Sadeghi, B. Ramezanzadeh, H. Eivaz Mohammadloo</i>	
Synthesis and Fabrication of Metformin-Functionalized Magnetic Hydroxyapatite Scaffold Via Electrospinning for Enhanced Bone Regeneration.....	97
<i>Mahyar Saber, Alireza Shaabani, Roya Sedghi</i>	
Automatic Identification of Spinal Vertebrae in CT Scan Images Using a Hybrid ResNet + U-Net Neural Network	102
<i>Nima Namazi, Reza A. Zoroofi</i>	
Digital Enhancement of Neonatal Fundus Color Photography: Improving RoP Diagnosis Through Image Processing.....	108
<i>Sara Salahi-Mogaddam, Ali Asadi Mohammadi, Hadi Amiri, Afsar Dastjani Farahani, Fatemeh Bazvand, Nooshin Karimi</i>	
A Modification of SynthEnsemble: A Different Approach to the Fusion of Diverse Classifiers for Automated Thoracic Disease Diagnosis	116
<i>Reyhane Vahedi, Behzad Moshiri</i>	
Leveraging Self-Supervision to Bridge the Data Gap in Acetabular Version Estimation.....	124
<i>Nastaran Khakestari, Seyyed Hossein Shafiei, Ata Jodeiri</i>	
Assessment of Transformer-Based Models for Cardiac Systolic Abnormality Segmentation in Cardiac Catheterization X-Ray Images	129
<i>Masoud Noroozi, Hossein Arabi, Ali Reza Karimian</i>	
Finite Element Modeling of Spinal Scoliosis Using X-Ray Images and Biomechanical Factors: Towards Digital Design of Braces.....	135
<i>Ali Bakhshian Talkhoncheh, Asieh Kaihani, Borhan Beigzadeh</i>	
Patient-Specific Anatomical Plate Outperforms Commercial Plate in Finite Element Analysis of Supramalleolar Osteotomy	141
<i>Mohadese Rajaeirad, Moard Karimpour, Mohammad Reza Hairi Yazdi</i>	
Comparative Finite Element Study of Titanium and CFR PEEK HAp Composite Dental Implants	147
<i>Aida Rahmani, Mohadese Rajaeirad, Sandipan Roy, Nima Jamshidi, Mohammad Khorsandi, Alireza Feizkhah</i>	
The Role of Porosity in Improving the Biomechanical Performance of Total Knee Arthroplasty: A Finite Element Perspective	153
<i>Farid Rashidi, Mohadese Rajaeirad, Mohsen Bahrani, Soroush Sadeghnejad</i>	
The Effect of Graying Process on the Mechanical and Chemical Properties of Human Hair: An Experimental Study	159
<i>Farzaneh Eskandari, Elham Rahimtoroghi, Faezeh Eskandari</i>	
Modeling Tumor Growth: The Impact of Nutrient Consumption, and Mechanical Stress	164
<i>Arshia Valipour, Fatemeh Ramezani Kashal, Seyedeh Sarah Salehi</i>	

Investigating the Effectiveness of Using the Hip Exoskeleton Assistive Robot (FUM-HEXA) on Endurance, Gait Symmetry, Stride Time and Cadence in Hemiplegic Stroke Patients: A Single-Arm Clinical Trial.....	170
<i>Amir Hojjati, Seyed Ali Hoseini, Hossein Negahban, Ali Moradi, Ebrahim Ghayem Hassankhani, Alireza Akbarzadeh</i>	
Comparison of Symmetry in EMG Activity of Selected Muscles in Response to Increased External Load During Walking in Individuals with and Without Chronic Low Back Pain	176
<i>Raheleh Tajik, Mehdi Khaleghi Tazji, Hamed Fadaei, Raghad Mimar</i>	
Preparation of Injectable Alginate-Based Hydrogel with Enhanced Mechanical Properties	183
<i>Morteza Mirzagoli, Fariba Ganji, Hossein Shaki</i>	
Schizophyllan-Based Hydrogels Characterization for Biomedical Engineering Applications	186
<i>Mohadese Koohialiabadi, Alireza Zarei-Dastgerdi, Sameereh Hahemi-Najafabadi, Seyed Abbas Shoja Sadati</i>	
Anti-Inflammation Drug Delivery System Containing Honey Bee Venom (<i>Apis Mellifera</i> Caucasian Honey Bee)	189
<i>Reyhaneh Nabiyouni, Rana Imani</i>	
Exploring Thigmotaxis and Rheotaxis Mechanisms in Sperm Cell Migration Within Different Microchannels Using Finite Element Method	194
<i>Yousef Mohammadi, Maryam Saadatmand</i>	
Photocrosslinkable GelMA Hydrogel for Antibacterial and Osteogenesis in Osteomyelitis	200
<i>Reihaneh Khademi, Masoumeh Alsadat Hosseini, Mahshid Kharaziha</i>	
Investigating the Migration of Cells with Different Degrees of Metastasis Before and After Treatment with Chemical Drugs Targeting Cytoskeleton Structure, Steroid and Androgen Receptor.	205
<i>Sayed Reza Ramezani, Afsaneh Mojra, Mohammad Tafazzoli-Shadpour</i>	
Sustained Release Drug Delivery System Based on MSNs Dispersed in an Injectable In-Situ Gelling Chitosan Hydrogel.....	211
<i>Mitra Asadian, Fariba Ganji, Ladan Rashidi</i>	
Simulation of Quadriceps Strengthening Exercise Following Total Knee Replacement- Effects on Patellofemoral Contact Mechanics	215
<i>Reyhaneh Salehabadi, Farzam Farahmand</i>	
Computational Simulation of Adolescent Idiopathic Scoliosis in the Spine.....	219
<i>Mohammad Hosein Zadeh-Posti, Zeinab Kamal, Mohadese Rajaeirad, Mohammadjavad Matin Einafshar, Nima Jamshidi</i>	
Evaluation of the Primary Stability of Two Types of Dental Implants Through Computational Modeling of Insertion Process and Pull-Out Test	225
<i>Armin Shanzari, Pedram Akhlaghi, Gholamreza Rouhi</i>	
Comparative Analysis of Blind Source Separation Methods for Biological Signal Processing	230
<i>Sheida Ansarinassab, Farnaz Ghassemi</i>	
Estimating Blood Glucose Levels Using PPG Signals: A Deep Learning Approach with Diverse Patient Profiles	238
<i>Mahdi Zeynali, Khalil Alipour, Bahram Tarvirdizadeh, Mohammad Ghamari</i>	

A Framework of Estimating Connectivity of Multichannel Data Using MVAR-Based Model of Distributed Adaptive Networks	245
<i>Fatemeh Afkhaminia, Mohammad Bagher Shamsollahi</i>	
A Novel Study on Classifying Smokers in Apnea Patients Using Physiological Signals Processing.....	253
<i>Ali Akbari, Zahra Moradi Shahrababak, Mehran Jahed</i>	
Comparison of Methods for Hand Trajectory Estimation in 3D Space Using EEG Signals	261
<i>Radin Khayyam, Mohammad B. Shamsollahi</i>	
Analysis of Learning Confidence Using Multimodal Neurophysiological Data	269
<i>Mohsen Mahmoudi, Fattaneh Taghiyareh</i>	
Comparative Evaluation of Neural Manifolds for Force Decoding from Intracortical Neural Activity.....	277
<i>Mohammadali Ganjali, Alireza Mehrdehnavi, Abed Khorasani</i>	
Temporal Dynamics in Instrumental Learning: Integrating Entropy Measures and Computational Models	282
<i>Zakieh Hassanzadeh, Fariba Bahrami</i>	
Application of Deep Learning Models in Classification of Sagittal Gait Patterns Based on Rodda's Classification System in Patients with Cerebral Palsy	289
<i>Alireza Arjmand Mazidi, Mostafa Banihashemi, Ali Jamshidian, Mahya Shojaeefard, Alireza Taheri, Farzam Farahmand</i>	
Preparation and Physical and Chemical Characterisation of PLA/RGO Composite	296
<i>Amin Dolatabadi, Maryam Poostchi, Aliasghar Behnamghader</i>	
Biological Evaluation of Poly(L-Lactide)-Based Fibrous Coatings for Titanium Implant.....	303
<i>Hamidreza Fotoukian, Masoumeh Haghighi Nazarpak, Atefeh Solouk, Alireza Nouri</i>	
How Psychological Scores Influence Head Motion in Resting-State fMRI	307
<i>Sadeq Mohammadi, Gholam-Ali Hossein-Zadeh, Mohammad Reza Raoufy</i>	
PDDG: Medical Image Fusion Based on Progressive Dual-Discriminator GAN	312
<i>Alireza Fayyazi, Emad Fatemizadeh</i>	
CardioTrackNet: A Hybrid Active Mesh and PWC Model for Enhanced Cardiac MRI Motion Analysis and Visualization	319
<i>Hamed Aghapanah, Reza Rasti, Saeed Kermani</i>	
Clustering Epileptic Spike Waveforms for Predicting Seizure Onset Zone.....	327
<i>M. Mohammadpour, C. Kapeller, M. Korostenskaja, J. Scharinger, C. Guger</i>	
Topological Data Analysis of Resting-State EEG for On/Off Medication Classification of Parkinson's Disease Patients	332
<i>Negar Goodarzi, Abolfazl Yaghmaei, Fariba Bahrami</i>	
Detection of Attention Deficit /Hyperactivity Disorder in Adults Using Complexity-Based Electroencephalography Features	339
<i>Vahid Asayesh, Mehdi Dehghani, Majid Torabi-Nikjeh, Sepideh Akhtari-Khosroshahi, Sebelan Danishvar</i>	
Classification of Schizophrenia Patients by EEG Microstate Features Based on Polarity Sensitivity of EEG Signals	345
<i>Ardalan Gerami, Mohammad Bagher Shamsollahi</i>	

Detecting Inaccurate Insertion Feed Rate Through Axial Force and Its Effect on Primary Stability of Dental Implants	353
<i>Mahdi Farrokhi Kashtiban, Gholamreza Rouhi</i>	
Potential of Tannic Acid-Zinc Ion Nanoparticles in Biomedicine: Synthesis and Characterization Perspectives	358
<i>Zahra Behrooznia, Jhamak Nourmohammadi, Yasaman Dezvare</i>	
Assessing the Risk of Musculoskeletal Injuries in a Car Seat Assembly Line Using a Novel Pose Estimation Method	365
<i>Milad Hosseini, Koosha Abdollah Fereydani, Matin Khezri, Asma Hallaji, Navid Arjmand</i>	
A Parametric Study on the Geometrical Design of Augmented Cones for Revision Total Knee Arthroplasty	372
<i>Yasamin Shahjavan, Sadegh Naserkhaki, Farzam Farahmand</i>	
Synthesis and Characterization of Chitosan Grafted PNIPAAm Copolymer: A Promising Scaffold for Corneal Regeneration	380
<i>Masoumeh Alsadat Hosseini, Reihaneh Khademi, Mahshid Kharaziha</i>	
Fabrication and Characterization of Agarose/ Poly (Ethylene Glycol) Diacrylate/ Hydroxyapatite Nanocomposite Hydrogel by 3D Printing Method for Cartilage Tissue Engineering	386
<i>Elahe Sartip, Tayebbeh Behzad, Mahshid Kharaziha</i>	
Fast-Dissolving PVA-based Microarray Patch for Wound Healing.....	394
<i>Alireza Koohikar, Hamid Reza Rezaie, Maryam Tajabadi, Rouhollah Mehdiavaz Aghdam, Parsa Ghaemmaghami, Rezvan Jamaledin</i>	
Meta-Learning-Based Classification of Melanoma Types in Dermoscopy Images.....	402
<i>Ali Norouzi Kahnemoei, Ali Mahloojifar</i>	
DCT-HistoTransformer: Efficient Lightweight Vision Transformer with DCT Integration for Histopathological Image Analysis	409
<i>Mahdi Cherakhloo, Mahtab Ranjbar, Mehdi Mohebbi, Bijan Vosoughi. Vahdat</i>	
Comprehensive Hyperparameter Tuning to Enhance Deep Learning Performance for Intracranial Hemorrhage Classification in Head CT Scans	416
<i>Mohammad Hoseyni, Kasra Davoodi, Fatemeh Pakdaman, Amirhossein Nikoofard, Mahdi Aliyari-Shoorehdeli</i>	
MMSSD: Image Registration Via Multiplicative Model Based SSD	424
<i>Roshanak Yazdani, Aboozar Ghaffari</i>	
EEG Emotion Recognition Using Graph-Based CSP.....	430
<i>Sharareh Talaie, Sepideh Hajipour Sardouie</i>	
Left and Right Brain Hemispheres Electrical Activity Correlation During a Visual Continuous Performance Task in ADHD and Normal Children	437
<i>Reyhaneh Amiri, Golnaz Baghdadi, Mohammad Ali Nazari</i>	
Relationship of IQ with Causal Connections Between Brain Salient Network Regions	443
<i>Mina Ghoorchian, Hamid Soltanian-Zadeh, Mir Mohsen Pedram, Mohsen Mir Mohammad Sadeghi</i>	
Mental Work Load Assessment Using Brain Connectivity Based Features of Simultaneous EEG and fNIRS.....	448
<i>Mohaddese Qaremoahmamlou, Mohammad Bagher Shamsollahi</i>	

An Optimal Control Platform for Simulation of Gait Patterns and Assistive Strategies, Based on “MATLAB-Moco” Co-Simulation	453
<i>Mohadeseh Shafie Tali, Iman Kardan, Alireza Akbarzadeh</i>	
Cell Growth Modelling in a Granular Scaffold in Dynamic and Static Culture	458
<i>Ali Hossein Khosravi, Elaheh Jooybar</i>	
Association Between Gait Deviation Index and Rodda’s Levels of Gait Severity in Children with Cerebral Palsy.....	464
<i>Mohammad Mahdi Davari, Mahya Shojaeefard, Farzam Farahmand</i>	
Improving CCA-Based Methods for SSVEP Classification Using a New Graph Reference Signal.....	468
<i>Nastaran Noori, Sepideh Hajipour Sardouie</i>	
Enhance CCA-Based Method with Modified CP Decomposition for SSVEP Frequency Detection	476
<i>Maryam Farhadnia, Sepideh Hajipour Sardouei, Mohammad Mikaili</i>	
Identifying Motor Tasks from EEG Signals of Planning and Execution Phases by CNNs in a Motor Learning Procedure	482
<i>Ali Darzi Masouleh, Fariba Bahrami, Ahmad Kalhor</i>	
Evaluation of EEG Microstates and Their Correlation with ECG in Major Depressive Disorder in Resting-State	490
<i>Elham Shoaie, Mohammad Bagher Shamsollahi</i>	
Simulation-Based Analysis of Sperm Morphology During Transport Through a Micropore Using Resistive Pulse Sensing	497
<i>Mahdi Aghaei, Ali Mohajeri, Mohammadjavad Bouloorch Tabalvandani, Majid Badieirostami</i>	
Effect of Design and Material on the Biomechanical Performance of Intervertebral Cage.....	502
<i>Koosha Abdollah Fereydani, Hassan Mohammadi, Farzam Farahmand, Kaivan Mohammadi</i>	
Improving U-Shaped Traps in a Microfluidic Chip to Trap Cancer Cells to Form Spheroids Using Simulation	509
<i>Hengameh Zolala, Fahimeh Gholamshahi, Maryam Saadatmand</i>	
Mechanical Characterization of Breast Cancer Cell Lines Based on Cell Culture Experiments.....	514
<i>Arisa Monshizadeh, Afsaneh Mojra</i>	
The Effect of Time-Dependent Prestresses at the Bone-Screw Interface Under Bending Load.....	519
<i>Ahmad Babazadeh Ghazijahani, Mohades Rajaeirad, Alireza Rouyin, Ali Kiapour, Michael Skipper Andersen, Mohammadjavad Matin Einafshar</i>	
SNR-Based Signal Selection Framework for Heart Rate Estimation Using rPPG Signals Extracted from Facial Videos	523
<i>Hamed Alimohammadi, Paniz Sabeghi, Aboozar Ghaffari</i>	
MuReB-Net: Advanced Residual Network with Modified Residual Blocks for Automatic Pain Level Classification.....	530
<i>Mahdi Morsali, Aboozar Ghaffari</i>	
Comparison of Six MRI Sequence Combinations for Brain Tumor Segmentation Using U-Net.....	538
<i>Mahdi Bazargani, Mohammad Javad Heidari, Mehrdad Anvari-Fard, Hamid Soltanian-Zadeh</i>	
Brain Tumor Segmentation Using Parallel U-Net and Multi-View Fusion	544
<i>Mohammad Soltani-Gol, Mehri Mirani, Mahdieh Asadi, Hamid Soltanian-Zadeh</i>	

Author Index