

In the name of ALLAH, the Beneficent, the Merciful



**1<sup>st</sup> INTERNATIONAL CONFERENCE ON ADVANCED**  
**STEAM**  
**EDUCATION 2023** Challenges & Opportunities

**ABSTRACT BOOK**



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## Message of Director ORIC

Dear Esteemed Participants,

Welcome to the 1st International Conference on Advance STEAM Eeducation: Challenges & Opportunities 2023, hosted by The University of Faisalabad (TUF). As the Office of Research, Innovation, and Commercialization (ORIC), we proudly spearhead TUF's commitment to advancing knowledge, fostering innovation, and driving transformative progress in the interdisciplinary domains of Science, Technology, Engineering, Arts, and Mathematics (STEAM).

This momentous event stands as a testament to our collective dedication to addressing the challenges and harnessing the vast opportunities within STEAM Education. The conference serves as an intellectual repository, igniting discussions, collaborations, and discoveries at the intersection of diverse disciplines. It offers a platform where pioneering ideas converge, where educators, researchers, industry leaders, and policymakers meet to unravel the intricacies, outline new pathways, and envision the future of STEAM Education.

ORIC at TUF advocates the culture of exploration, innovation, and impact. We are committed to nurturing a culture of research, innovation, and entrepreneurship, empowering our academic community to pioneer cutting-edge research and translate discoveries into tangible solutions that shape our world.

As we embark on this profound journey together, we urge all participants to engage deeply, exchange ideas passionately, and forge connections that surpass boundaries. Let us collectively navigate the challenges and embrace the boundless possibilities that lie ahead in advancing STEAM Education. We extend our heartfelt gratitude to all contributors, participants, and supporters for their unwavering commitment to this transformative pursuit.

Wishing you all an inspiring and fruitful experience at this inaugural conference.

Warm Regards,  
**Prof Dr Aman Ullah Malik**  
Director ORIC

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# **SCIENTIFIC SESSION 1**

## **Computer Sciences**

### **Session Chair:**

Prof Dr Sultan Zia  
NFC, Faisalabad

### **Session Co. Chair:**

Dr Uzair Saeed  
CS Department, TUF

### **Keynote Speaker:**

Dr Syed Hamid Hussain Madni  
University of Southhampton

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# Machine Learning based Data-Driven Approach for Cardiovascular Disease Biomarker Identification and Risk Stratification

Authors: Hina Zafar, Majid Hussain, Amna Iqbal

## Abstract

Cardiovascular disease (CVD) remains a prominent global health issue, demanding the development of more accurate and efficient diagnostic methods and risk assessment tools. Traditional approaches to CVD diagnosis have their limitations, prompting the exploration of alternative solutions. This paper introduces the problem by highlighting the ongoing challenges in CVD diagnosis and underscores the potential of machine learning (ML) to address these issues. Literature reviewed illustrate the need for advanced diagnostic and risk assessment tools. Existing methods have proven less than ideal in terms of accuracy and effectiveness. This paper delves into the inherent limitations of these conventional techniques and illustrates the potential impact of ML in redefining CVD diagnosis and risk assessment. The core of our research revolves around the practical application of ML techniques to classify CVD biomarkers. an array of diverse datasets is involved that encompass genetic and clinical data. ML algorithms, such as logistic regression, decision trees, and support vector machines, play a crucial role in building robust models capable of precise classification. The emphasis on feature selection underlines the commitment to identifying the most informative biomarkers to enhance model performance. convolutional neural networks (CNNs) are majorly used for classification. Beyond classification, the study explores the far-reaching implications of ML in personalizing treatment plans, modeling disease progression, and uncovering novel biomarkers. We believe that proposed holistic approach to CVD management not only represents a significant step forward in diagnosis and risk assessment but also holds the promise of improving patient outcomes and enhancing healthcare practices on a global scale.

**Keywords:** convolutional neural networks, cardio vascular disease, machine learning

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# Determining the Correlation between Google-Play Store Application Icons and Success

Author: Ahmad Bilal

## Abstract

Numeric review rating is crucial for an application's success. Because, it indicates quality and has a noteworthy impact on the user intentions to prefer (download) a certain application over others. A common practice among the developers is to fashion the store listing (titles, icons, descriptions) of their applications in such a manner that portrays a charming initial impression and entices the users to award superior numeric ratings. Among all the variables of the store listing, icons might have the strongest impact on the consumers in terms of depicting an eye-catching and aesthetic first impression. However, to the best of our knowledge, traditional literature which investigated the correlation of application icons with the success is dominated by empirical studies and Machine Learning approaches in this domain are still scarce. Moreover, empirical experiments may only evaluate small datasets. Therefore, this proposed research work is targeted to establish any positive or negative association of Google-Play application icons with the numeric review rating by employing a Machine Learning framework. Such scientific analysis can investigate larger dataset of application icons and extract useful information (insights) those may elude empirical analysis. Whereas, according to the results, there exist certain visual features in icons, such as high variation in colors, complexity and entropy, those are linked with positive numeric rating. Moreover, icons comprised of textual elements have a negative influence on numeric rating.

**Keywords:** Google play store, App store analysis, Feature significance, App icons

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# Enhancing Spam Detection through Linguistic and Spammer Behavior Features

Authors: Amna Iqbal, Muhammad Younas, Hina Zafar

## Abstract

The various types of fake text generation practices make review spam detection challenging. Different marketing firms ask users to write reviews or comments about certain entities like products, services, commodities, etc. The available reviews significantly influence the firm's reputation and serve as a first-hand survey of the firm's goods and services. The online reputation assessment serves as a success factor for many businesses. Recent artificial intelligence advancements allow digital systems to autonomously detect and identify spam reviews. This paper proposes a Framework Review Spam Detection (FRSD). This FRSD framework using spammer behavior and linguistic features using machine learning (ML) and deep learning (DL) techniques. We analyze spammer behavior features for spam detection. Fine-tuned ML algorithms applied such as RF, and SVM, while deep learning methods, including LSTM, Bi-LSTM, GRU, Bi-GRU were evaluated for their performance. It observed that our proposed FRSD framework obtained the highest accuracy of 92.57.

**Keywords:** Machine learning, Deep learning, Spam detection, Linguistic features spammer, behavior features



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# Assessing The Impact of Routing Protocols on TCP Variant Performance Inside a Mobile Ad-Hoc Network

Authors: M. Zubair Tahir, Kainat Rizwan, Muhammad Asif, Mudassar Ahmad

## Abstract

of moving nodes that exist without the assistance of a main/server device. Each device discovers and shares a path with nearby network participants. Congestion is common in these types of mobile connections because nodes have varying processing capacities. The Transmission Control Protocol (TCP) is frequently used in MANET to achieve reliable communication. TCP variants such as High-Speed, Vegas TCP, and TCP Veno have been developed to improve overall communication performance. MANET nodes are linked using various routing protocols such as On-Demand/Reactive and Table-Driven/Proactive Routing Protocol. Other protocols, such as Hybrid, are a hybrid of proactive and reactive protocols. We investigated the effect of two MANET routing protocols (Destination-Sequenced Distance Vector Routing (DSDV) and DSR (Dynamic Source Routing Protocol) on the performance of three TCP variants in this study (TCP Vegase, TCP Veno and TCP High-Speed). We used (Packet Loss Ratio, End-to-End Delay, Data Delivery Ratio, and Throughput) as performance measures and a Random Waypoint mobility model with different node densities of 10, 20, 50, 75, and 100. Conclusions are developed using statistical analysis of results obtained from the NS2 simulation tool.

**Keywords:** MANET, Network Security, Network Protocols, Routing, TCP

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# **An Enhanced Predictive Model for Heart Disease Diagnoses Using Machine Learning Algorithms**

Authors: **Muhammad Usman Javeed, Dr. Waheed Ramay, Shafaqat Maria, Hira Shakeel**

## **Abstract**

Heart disease is the primary reason for death in humans, with cardiovascular disorders being responsible for most cases. Risk factors include unhealthy lifestyle, depression, high blood pressure, and high cholesterol. Despite advancements in expert systems for diagnosing heart disease, accurately predicting the disease remains a challenge. To deal with such challenges, the concepts of Machine Learning, and Artificial Intelligence are investigated to provide an overview of the most often deployed methodologies for diagnosing cardiac disease. Cardiovascular diseases can be predicted by investigating the patient's data. In this paper to attain maximum accuracy, ensemble learning is used. Performing pre-processing techniques such as one hot encoding, normalizing the data, removing outliers, and optimizations of models by hyper-parameter, using ensemble learning led our model to an accuracy of 96.7%. In ensemble learning distinctive algorithm are used as weak learners. Every classifier is trained over the dataset and tested to evaluate the performance of each week's learner. Then the best learner amongst classifiers is selected for the final model for predictions in the future resulting in introspectively accurate outcomes. This model does not only help the medical community in the diagnosis and curing of heart patients but provides the bases for another researcher to adopt the technique and further improve the model.

**Keywords:** Machine Learning, Natural Language Processing, Text Mining

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# Optimizing Urban Mobility: A Signal Request-Driven Virtual Intelligent Parking Lot System for Efficient AGV Management

Authors: Muhammad Yaseen, Dr Majid Hussain

## Abstract

This study introduces the creation and theoretical investigation of an advanced Virtual Intelligent Parking Lot System (VIPLS) designed to tackle basic issues that conventional parking management systems encounter. a signal request technique to address challenges including limited parking space, poor service quality, and Environmental changes low consumer satisfaction.

The essence of this system resides in its inventive methodology for addressing the allocation of parking spaces, planning the paths of Automated Guided Vehicles (AGVs), and resolving deadlocks. The allocation of parking places is optimized using a process that considers proximity, hence improving the efficiency of space allocation. Path planning utilizes Dijkstra's algorithm to calculate the most efficient routes for AGVs, guaranteeing smooth navigation inside the parking infrastructure. The signal request technique is a crucial element in resolving deadlock issues at junction nodes. This approach utilizes a dynamic priority system to efficiently address AGV backlog caused by deadlock conflicts. It takes into account several variables, including job priority, remaining distance, transportation type, waiting time, and peak hours.

This study not only proposes a new concept of a Virtual Intelligent Parking Lot System but also presents a unique method to resolve deadlock conflicts, which greatly enhances the efficiency and responsiveness of parking management systems. The suggested VIPLS framework presents a potential avenue for transforming urban parking infrastructure and improving user experience, in line with the changing requirements of smart cities.



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# **SCIENTIFIC SESSION 2**

## **Computer Sciences**

### **Session Chair:**

**Prof. Dr Ghufran Khan**  
FAST-NU, Faisalabad

### **Session Co. Chair:**

**Dr Mudassar Ahmad**  
CS Department, NTU

### **Keynote Speaker:**

**Prof. Dr Usman Ghani Khan**  
Director, National Centre of Artificial Intelligence,  
Chairman CS Department UET Lahore.

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# An Enhanced Approach for Text Ranking Using BART Model with CrossEntropyLoss

Authors: Ghulam Murtaza, Dr Muhammad Yonus, Dr Mariam

## Abstract

Text ranking is a pivotal task in natural language processing that aims to rank a set of documents or passages according to their relevance to a given query. Recently, pre-trained transformer models, such as BERT, T5, and BART, have shown remarkable performance on various text ranking tasks. However, these models are often fine-tuned with pointwise loss functions that do not directly optimize the ranking performance. In this paper, we propound an enhanced approach for text ranking using a sequence-to-sequence model, namely BART-BASE. We fine-tune the BART-BASE model with a pointwise loss function, namely CrossEntropyLoss, that minimizes the binary cross-entropy loss between the predicted relevance score and the true relevance label. We evaluate our model on the MS Marco Passage ranking dataset, which is a large-scale and challenging benchmark for text ranking. We compare our model with the state-of-the-art model, RankT5, which is a T5-based ranking model that can be fine-tuned with pairwise or listwise ranking losses. We show that our BART-BASE model can outperform the RankT5 model on various metrics, such as accuracy, precision, recall, F1-score, NDCG, and MRR. We also analyze the features and drawbacks of our model and discuss the future directions for text ranking with sequence-to-sequence models.

**Keywords:** Text Ranking, NLP, Transformer, BART, Seq-to-Seq Models, CrossEntropyLoss, RankT5

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# Hybrid Machine Learning Approach for Network Intrusion Detection

Authors: Sunil Ashraf, Hina Zafar

## Abstract

The present era is the modern technology evolving era for cyber security. It boons a dynamic battlefield for cybersecurity concerns and for security experts. A lot of machine learning works regarding intrusion detection have been evolved recently but these methods depict low accuracy. But the machine learning area in the last few years has a lot of improvement in their algorithms to detect and classify the intrusion. Therefore, to cope with the present challenge a hybrid machine learning approach has been proposed to detect and classify the network intrusions. The CICIDS2017 dataset has been growing since its inception attracting researchers for model and algorithm study and development process. We discovered the entire shape of a dataset with 3119345 instances and 83 attributes, each of which contains 15 class labels. We discovered a consolidated dataset of CICIDS2017 with 2830540 instances after eliminating the missing instances. The proposed hybrid machine learning approach almost used the seven classifiers known as decision tree, random forest, naïve bayes, ADA, XGB, KNN and logistic regression. The model evaluation is done on CICIDS2017 dataset for testing and training processes. The model evaluates the accuracies as decision tree: 0.99, random forest: 0.96, naïve bayes: 0.85, ADA: 0.97, XGB: 0.96, KNN: 0.98 and logistic regression: 0.91. The decision tree depicts the highest accuracy which is 0.99 due to its parametric function evaluation and less misclassification error. The language used to implement the proposed model is python with its libraries.

**Keywords:** Hybrid intrusion detection, CICIDS2017 dataset-Nearest Neighbor (KNN), Adaboost (ADA), Extreme Gradient Boosting (XGB), Decision Tree (DT), Machine Learning

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# **A Decentralized and Secure Framework for Information Sharing using Blockchain and Inter Planetary File System (IPFS)**

Author: Muqadsa Jabeen, Majid Hussain

## **Abstract**

In Governmental Organizations, sharing information safely and effectively between multiple departments, agencies, and stakeholders is frequently difficult. Data breaches, unauthorized access, data manipulation, and a lack of transparency created problems with conventional centralized systems. These issues are being solved by creating a decentralized and safe framework for information sharing using blockchain and IPFS. This study suggests a framework of decentralized information-sharing systems for an organization built on the Interplanetary File System (IPFS) and, decentralization, immutability, and consensus properties of blockchain to create a safe and open network for information sharing. The system offers improved security, data integrity, access control, and transparency for information exchange within the governmental organization by utilizing the capabilities of IPFS and blockchain. Sensitive information will be safely saved and transferred, including public records, financial information, and legal documents. Since the files are dispersed over the IPFS network, it is challenging for outsiders to access or alter the data. Blockchain is used to track information-sharing transactions, producing an audit trail that is transparent and immutable. This article offers a strong solution for organizations and individuals looking for safe, transparent, and resilient information-sharing settings by leveraging the capabilities of both technologies. Ethereum platform has been used with solidity language for the implementation of this system. All data was also proved with a mathematical model. The study's findings resolve the issue of extensive data sharing while realizing data decentralization and guaranteeing data storage security.

**Keywords:** Blockchain Technology, IPFS, Security, Privacy, Government Organizations, Data Sharing, Smart Contract



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# **Solution for Cyber Automation Clarifying Real-World Resilience via Reinforcement Learning Malware Image**

Authors: Kainat Rizwan, Mudassar Ahmad, Muhammad Asif

## **Abstract**

Cyber-attacks have been a major concern for the cyber security domain. Every hacker follows a series of cyber-attack stages which are known as cyber kill chain stages. Each stage has its norms and limitations to be deployed. For a decade researcher have been focused on the detection of these attacks. Merely watcher tools are not optimal solutions anymore. Everything is becoming autonomous in the computer science field. This leads to the idea of Autonomous Cyber Resilience Defense algorithm design in this work. Resilience has two aspects: Response and Recovery. Response requires some actions to be performed to mitigate attacks. Recovery is patching of the flawed code or back door vulnerability. Both aspects were performed by human assistance by far in the cybersecurity defense field. Humans were used for recovering and responding to any malicious activity being detected by the tools. This work is aiming to develop an algorithm based on Reinforcement Learning (RL) with Convoluted Neural Network, (CNN) which is far nearer to the human learning process for malware images. RL learns through a reward mechanism against every performed attack. Resilience mitigation with proper autonomous defense architecture with the help of RL techniques and decision processes is the optimal approach to the initial autonomous defense era. RL impact and induction measure for malware images measured and performed to get optimal results. Based on the Maling Image malware, dataset successful automation actions are received. The proposed work has shown 98% accuracy in the classification, detection, and autonomous resilience actions deployment. This Algorithm is a novel autonomous and intelligent approach to take response and recovery actions on image malware correspondingly.

**Keywords:** Autonomous cyber defense, Cyber automation, Cyber resilience, Cyber security, Markov Decision Process, Q-learning, Reinforcement learning, Resilience, Response, Recovery

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# Evaluating Performance of OLSR, DSR, and ZRP Routing Protocols in Application Areas

Authors: Masoom Ul Hassan Rehan, Kainat Rizwan, Muhammad Asif Habib, Mudassar Ahmad

## Abstract

The advancement of technology and need for massive communication infrastructures have ushered in the period of wireless sensor networks. The connectivity of these nodes forms a network known as the wireless sensor network. WSNs are an appealing choice for a variety of applications due to their low cost, ease of implementation, ad hoc nature, and multi-functionality. WSN applications range from environmental monitoring to health care applications, military operations, transportation, security applications, weather forecasting, real-time tracking, and fire detection, among others. A routing protocol is used to transfer data from one point to another. The issue is that we must choose a protocol for transmitting data to the destination. In this study, we examine the performance of OLSR, DSR, and ZRP routing protocols in WSN applications. Based on the results, we can conclude that one routing protocol outperforms the others in terms of throughput, end-to-end delay, average jitter, and packet delivery ratio. The outcomes are run through the NS2 simulator

**Keywords:** DSR, Network Protocols, Network Security, NS2, OLSR, ZRP

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# **SCIENTIFIC SESSION 3**

**Electrical Engineering,  
Civil Engineering,  
Mathematics**

**Session Chair:**

**Dr Aashir Waleed**

UET, Lahore (Faisalabad Campus)

**Session Co. Chair:**

**Dr Muhammad Arshad Shehzad Hassan**

The University of Faisalabad.

**Keynote Speaker:**

**Dr Aashir Waleed**

UET, Lahore (Faisalabad Campus)

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## Development of Smart Tree for Ecofriendly Production of Electricity

Authors: Gulshaan Arshad, Ruqia Rabab, Muhammad Waqar, Dur-e-Kashaf, Muhammad Shahid, Aashir Waleed

### Abstract

Within the last few years wind and sunlight-based energy has emerged as perhaps the most wellspring of environmentally friendly power age. In this work, by utilizing the wind energy, "Smart-Tree" is presented in which various little vertical axis wind turbines (VAWT) are fixed on the tree structure to fulfil the need of society. For this work, savonius shaped leaves have been developed for the smart tree which generate energy on blowing of wind. Moreover, the as developed smart trees can be installed on public places such as parks, housing colonies and highways through which we can empower the low power appliances (such as mobile phones, laptops, and streetlights etc.). This project also presents the idea of generating energy in a better and more proficient way with less cost.

**Keywords:** Wind Energy, Electricity, Renewable, Turbines, Smart Tree

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# Wirelessly Automated Detection, Localization, and Intimation of the Faults in the Power Distribution Network

Authors: Amna Tabassum, Isma Nosheen, Muhammad Kamran, Muhammad Shoaib, Umar Siddique Virk, Aashir Waleed

## Abstract

As the world is progressing day by day, it has become inevitable to synchronize the power systems with advanced technologies. The continuous power flow is an important feature of a power system, but it is still a challenge for the developing countries like Pakistan due to (i) increased incidents of the fault occurrence and (ii) the usage of traditional methods for fault location finding and fault intimation. This work presents an advanced solution for the detection, location search and intimation of the faults in power distribution system through Global System for Mobile (GSM) technology. In this work, the current transformers (CTs) have been used for the current sensing from the distribution lines and the measured current levels are compared with the reference level through a controller for the fault detection. If a fault occurs, the installed GSM modules in the distribution system provide the location of fault along with the fault intimation issuance to the operator through a central control unit (CCU) of distribution network. Additionally, at the same time, the CCU also generates trip signals for relays on fault occurrence in order to provide the required protection to power system from faults. Overall, the proposed work presents a smart and accurate solution for the timely detection, spotting, and the reporting of fault incidents.

**Keywords:** Fault Detection, Fault Location, Power System, Wireless, Central Control Unit

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# NM-Polynomial and Neighborhood Degree Based Topological Indices of Octagonal Grid and Triangular Benzenoid Graphs

Author: Ali Hussain

## Abstract

Chemical graph theory is a field of research in which we use tools of graph theory to solve problems arising in chemistry. Topological index is a numerical number that helps us to understand Chemical compounds, Molecules, etc. With the help of a topological, one can predict various properties of concerned chemical structure without performing experiments in lab. In this research article we present a groundbreaking approach that introduce a new dimension to analysis of structural properties exhibited by an array of triangular and octagonal grid graphs. Our methodology is not only innovative but also addresses the inherent complexities of diverse grid graphs. Specifically, we introduce and explore the concept of neighborhood M-Polynomial across a range of grid graph classes, offering a comprehensive framework for evaluating their structural attributes. By harnessing the potential of neighborhood M-Polynomial, we delve into the intricate calculations of neighborhood degree-based indices for these network types. These indices provide us with a multi-faceted perspective on the networks intricate connectivity patterns and underlying topological features, allowing to extract invaluable insights that go beyond the surface level. As we put our approach to the test the results we obtain underline not only the efficiency but also the adaptability of our proposed technique in addressing the complexity posed by diverse networks. This method goes beyond a simple mathematical exercise. With each calculation and analysis, we advance our comprehension of the intricate web connections that characterize these triangular and octagonal grid graphs.

**Keywords:** Chemical Graph, Neighborhood M-Polynomial

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## New Concepts in Fuzzy Soft Graphs

Author: Umair Amin

### Abstract

Fuzzy soft set theory was initiated by Molodtsov as a mapping from a set of parameters to the fuzzy subsets of the universe, which provides a parameterized view for solving problems in various fields such as economics, medical science, environment, and social science. In this paper, we discuss the concepts of bondage and non-bondage sets of fuzzy soft graphs. The bondage and non-bondage numbers of fuzzy soft graphs are also defined. The upper bounds of both bondage and non-bondage are given, and some results are discussed. The exact values of both are determined in fuzzy soft graphs.

**Keywords:** Soft Graphs, Fuzzy Soft Graph

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# Bioconvective Flow of Nanofluid with the Application of Gyrotactic Microbes

Author: Faiz Muhammad

## Abstract

In this study, we investigate the interesting dynamics of a nano fluid in the incidence of gyrotactic microbes, importance their bioconvection behavior through a porous medium. Nano fluids, characterized by the incidence of nanoparticles, have gained significant attention due to their enhanced thermal properties and several applications in various fields. Gyrotactic microorganisms, on the other side, exhibit interesting collective motion patterns below the influence of fluid flow and gradients. Understanding their behavior within nano fluids is essential for both scientific inquiry and practical applications. In order to get better the heat efficiency of several systems, microbe fuel cells as micro-mixers driven by bacteria, micro-volumes like microfluidics devices, enzyme biological sensors, and chip-shaped small devices like bio-microsystems, among others. Another example is the application of microorganisms in microbially improved oil recovery. In arrange to maintain separation between the oil behaviour layers, extra nutrient-rich microorganisms might be added, gyrotactic microorganisms must be added to the nanoparticles. Additionally, porous media is essential for increasing thermal efficiency. The flow of nanoparticles reinforced by gyrotactic microorganisms strengthens heat properties of various thermal systems. The combination of microbes, in nanoparticles not only improves the fluid's heat characteristics but also creates flow stability. The goal of this work be to understand the flow of collection and thermal through a Darcy Forchheimer fluid with pores that simultaneously involve nanoparticles and microorganisms. With this work, we report a unique analysis of heat radiation-induced bioconvection caused by gyrotactic microorganisms in a nanoparticle flow above a nonlinear stretching surface in a porous media. The method of successive over-relaxation is used to address the coupled system with nonlinear equations. The approximated explanation is then discovered by modifying an algorithm in the MATLAB program. The motile bacteria with the bioconvection Peclet number clearly increase the density of microorganisms, while the thermal radiation phenomena raise the temperature, according to numerical results.

**Keywords:** Slip Condition, Gyrotactic Microorganisms, Nanofluids, Bioconvection, Darcy-Forchheimer Flow, Thermal Radiation, Successive Over Relaxation Method



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# **Sustainable Geopolymer Concrete: A Comparative Study of Corn-Cob and Bagasse Ash as Partial Replacements**

Authors: **Muhammad Usman Kharal, Saqib Hussain**

## **Abstract**

Geopolymer concrete is a sustainable and environmentally friendly alternative to traditional Portland cement concrete. This study investigates the workability and strength of geopolymer concrete. Fly ash and slag, which are byproducts of industry, were used to cast the geopolymer concrete. However, the workability of the geopolymer concrete is hard to achieve. To address this issue, various industrial waste byproducts were added to enhance its strength and workability. After 28 days of ambient curing, the specimen was tested in the compression testing machine. The results indicated that increasing the composition of sugarcane bagasse ash in fly ash-based geopolymer concrete leads to high workability and strength up to 15% replacement only. Conversely, increasing the composition of corn cob ash in fly ash geopolymer concrete results in slightly high strength at 5% replacement and low workability. It was also observed that the mixture becomes very dry when increasing the composition of corn cob ash in fly ash-based geopolymer concrete. The findings suggest that sugarcane bagasse ash can be used as a substitute for fly ash to improve the workability and strength of geopolymer concrete. However, corn cob ash should be used in moderation to avoid a decrease in workability. The findings of this study have significant implications for the development of eco-friendly and sustainable geopolymer concrete by using locally available waste materials.

**Keywords:** Geopolymer Concrete, Sustainable Concrete, Bagasse Ash, Corn Cob Ash



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# **SCIENTIFIC SESSION 4**

## **Arabic & Islamic Studies**

### **Session Chair:**

**Dr Sultan Shah**

Dean, Faculty of Languages, Islamic &  
Oriental Learning, GCU, Lahore

### **Session Co. Chair:**

**Prof Dr Matloob Ahmad**

Dean/Head, Department of Islamic &  
Arabic Studies, TUF

### **Keynote Speaker:**

**Prof Dr Shahbaz Manj**

Professor/Chairman, Department of Islamic Studies,  
University of Education, Lahore.

### **Guest Speaker:**

**Dr Rifaat Ali Muhammad**

Professor/Dean, Faculty of Arabic for Higher Studies,  
Al Azhar Assiut/Egypt

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# **Role of Religious teachings of peace for the Establishment of peace in this world**

Author: **Prof. Dr. Muhammad Shahbaz Manj**

## **Abstract**

Religion has been a significant part of human civilization for thousands of years and has played a crucial role in shaping human values, beliefs, and morals. The role of religion in promoting peace and harmony in the world has been a topic of discussion for centuries. In this article, we will explore the relationship between religion and world peace, and how various religions can contribute in promotion of peace and the resolution of conflicts.

**Keywords:** Religion, teachings of peace, establishment of peace

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## **Transgender Law: Reality and Shariah Status**

Author: **Dr. Syed Abdul Ghaffar Bukhari**

### **Abstract**

Pakistan took the lead in enacting the Transgender Persons (Protection of Rights) Act in 2018. This law declares that gender identity belongs to any person. The bill defines the term “transgender” broadly to include intersex individuals, Khwaja Siras and people with a gender expression that differs from social norms and cultural expectations based on gender with which they were born. In Pakistan, the law states that transgender individuals will have the right to be recognized according to their self-defined gender identity. The study explores the Protection Act of 2018, its implementation and current status in Pakistan. It also discovers the challenges faced by transgender after Protection Act 2018.

**Keywords:** Transgender, Act 2018, Protection of Rights, Islam

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## Islamic Lens on Gender Equality

Author: Dr kafait Ullah Hamdani

### Abstract

Gender discrimination is an important problem in today's world. In Islam, men and women are equal as human beings because Islam ultimately establishes that all humans have a common origin. Islam declares that all people have equal status, importance and dignity, but determines the different roles of men and women. This article explores how today's world view gender and gender roles as defined by West. The Western concept of gender roles are affecting Islamic societies as different campaigns run by women demanding equality. This study review contemporary gender roles and how Islam defines gender and gender equality in the light of Quran and Hadiths.

**Keywords:** Gender, Discrimination, Gender roles, Quran, Hadith

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## Function of Religion and Education

Author: Dr Muhammad Waris Ali

### Abstract

Allah has provided the needs to fulfill man's physical requirements as well as arranged for his spiritual education and training after the creation of man.

For this purpose, Allah has sent His chosen prophets and messengers. Allah Almighty crowned man with the crown of prophethood and made him the first teacher so that people would be told the purpose of their creation and they would not follow the path of error. As far as religion is concerned, it is not a separate thing that has entered into human life from some alien world, but with the existence of man, he was also given the consciousness of religion. The purpose of the Prophets of Allah was to strengthen the people religiously and to attract them to the supernatural force that brings all things into existence and governs them. That is why, Allah sent the first man in the world as a prophet to reform the people. This means that religion and man are side by side. Education is the means of transferring the ideas, traditions, culture and customs of human society to the next generation and as soon as the society comes into existence, consciously and unconsciously, education starts to work in one way or the other. The religion is based on the thoughts and ideas of the society about the world and the hereafter and about supernatural forces. And these things are not separate from the society, their existence is also realized with the existence of the society. Every society develops its education on the basis of its ideology and thought. If religion prevails in this thought and ideology, religion will have a deep impression on its education, and if that society is disgusted with religion, then its education is based on religion-averse ideas. In short, education and religion are closely related and cannot be separated. In spite of millions of efforts, human thinking continues to work in one way or another in the educational process.

**Keywords:** education, society, religion, culture,

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## Religion and Gender Studies: Examining the Intersection

Authors: Abdul Qayyum Gondal, Prof. Dr. Matloob Ahmad

### Abstract

Examining Gender and Religion Through Intersectional Analysis

Scholarship exploring the intersection of religion and gender has grown significantly in recent decades. Feminist and intersectional theories provide critical frameworks for analyzing how religious doctrines and institutions shape and are shaped by social constructions of gender, sexuality, race, and other identity factors over time. This emerging field yields valuable insights into complexity surrounding religion's relationship to systems of power and social change.

Key areas of inquiry include critically examining gendered language in sacred texts to understand how certain interpretations may reflect historically dominant masculine perspectives. Scholars reevaluate canonical works through feminist hermeneutics to uncover implicit or explicit biases. Institutional practices are also studied, such as female exclusion from religious leadership roles or modesty requirements denoting patriarchal control.

However, experience of religion is not monolithic and varies greatly based on one's social location. Marginalized groups like LGBTQ+ individuals and unmarried women illustrate how traditional interpretations sometimes conflict with lived realities. Meanwhile, religion remains meaningfully empowering for many seeking to integrate faith authentically with full identity expression.

Moving forward, intersectional analysis must continue prioritizing underrepresented voices. For example, research could explore racialized or disabled experiences of normative gender constructs within faith. Comparative studies evaluate dissimilar developments across religions and regions. Historical contexts must also be considered to avoid presentism.

In summary, the religion and gender field yields critical understanding of complexity within faith-based power dynamics and social change processes over time. As feminist and intersectional frameworks broaden scholarly conceptions, marginalized perspectives will further transform theological and institutional norms regarding religion's relationship to gender locally and globally. Expanded inclusive inquiry remains imperative.

**Key Words:** Gender discrimination, Feminist Theories, Masculine and patriarchal control, inter-sectional analysis, power dynamics, marginalized groups



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## Relationship Between Religion And Science: A Research Study

Authors: Dr. Muhammad Qasim, Pro. Dr. Matloob Ahmad, Muhammad Ashraf

### Abstract

Religion (Islam) has always shown the path of moderation while teaching its followers to pursue scientific knowledge. Religion (Islam) has given a whole system of orders and regulations to man according to human nature and psychology in this work. And by erasing the contradictions of his outer and inner self, he has given him the awareness of the truth of his motto. Pondering and deliberation is the order of Allah Almighty. Because the doors of thought do not open without thinking, and if these doors remain closed, the journey of history stops and the history of the evolution of the human race is lost in darkness. In the early centuries of their journey, Muslims not only made a lot of improvements in scientific knowledge through thought and wisdom. Rather, it also encouraged man to conquer the universe in the light of Quranic orders. Therefore, some surprising inventions were also implemented during this period. And such solid foundations were provided to the scientific sciences. On which the foundation of modern scientific sciences was laid. Of which religion (Islam), science and human creation is also one of the most important topic.

**Keywords:** Religion (Islam), Science, Pregnancy, Sex Determination, Creation of Man.

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# **A Study of Religious Tolerance in the Present Age in the light of the Biography of The Prophet (Peace and Blessings of Allah Be Upon Him)**

Authors: Dr. Hafiz Muhammad Sarfraz Ghani, Humaira Khalil

## **Abstract**

Islam is a religion of tolerance, compassion and acceptance. Islam promotes brotherhood, sympathy, kind-heartedness, freedom, equality, Peace and co-existence by providing a complete code of life to the humanity. The last Prophet of Islam, Hazrat Muhammad (PBUH) is the perfect embodiment of great human qualities. Hazrat Muhammad (PBUH) always emphasized on forgiveness and tried his best to bring harmony among other religions. The mission of his life was to spread gentleness, mercy, kindness, benevolence among all other religions. Therefore, being a Muslim it is our moral and religious duty to highlight the teachings of the Holy Prophet, (PBUH) and his Seerah at every forum. This will enable the Muslims to follow the Sunnah and it will also people of other faiths to gain a better understanding of Islam. There are many instances which can be quoted from the Seerah of the Holy Prophet, (PBUH) as a rich lesson of harmony and tolerance. Islamic teachings are based on the principles of peace and compassion. We should understand these bedrock principles of Islam. Our actions based on these important tenets of faith will ensure peace throughout the world.

Today, when intolerance and impatience has taken place every sapphire of society, it has become imperative to know the modeless and norms adopted in such situation by the Holy Prophet, (PBUH). How the Holy Prophet, Hazrat Muhamnmad (PBUH) treated the worst enemies and how he responded against those who cursed him? His outstanding behavior with the he conquered people of Mecca must be observed. It is indeed to be considered that his path must not only be followed in the personal life but the message should be preached for the general good of man-kind.

The contention of this article is that Islam is a religion of tolerance, peace and reconciliation. This paper also provides information regarding the biography of the Holy Prophet, Hazrat Muhamnmad (PBUH) concept of tolerance. In the present age, while the Muslim Ummah is facing the challenges of terrorism was and extremism the teachings of The Holy Prophet are the fountain head of guidance for whole mankind.

### **KEY-WORDS: -**

Al- Quran; Al-Seerah; Tolerance; Mankind; Co-Existence; Reconciliation; Religions.

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## The Role of Teacher in Learning Process

Author: Prof. Dr. Matloob Ahmad

### Abstract

Education is dynamic form in the life of every person because it influences his physical, mental, emotional and ethical development. Historical evidences support the assumption that the rise and fall of any civilization is directly or indirectly linked with the educational philosophy with great hardworking and commitments of its Teachers who themselves are the product of that civilization. No doubt, knowledge may be gained from books but the love, purity, attraction, fondness and enthusiasm for attaining the education is transmitted only by the personal contacts, struggle and attributes of Ideal Teacher. Because Teachers are Nation Builders and construct a stable Society play an important role in learning process. They are those who produce the educated products of Humanity. The Holy Quran says, "Say, Are those who know equal to those who do not know? (Az-Zumar:9) And The Holy Prophet said, "Verily I have been sent as a Teacher" (Sunan Ibn Majah Hadith 229).

It is cleared that education gaining is the most important for any individual but it can only be practiced by Teacher who will have qualities i.e Hardworking, Integrity, Sincerity, Expertness, Communicational Skilled and Committed with goals. So ,it can be said that the teacher is main pillar of learning process and educational building which can never be ignored. Results: 1-Education is the ornament of the Human Being 2-Educated person is not equal to Non-Educated 3-Teacher is the main builder of Nation and Ideal Society 4-Learning Process found incomplete without Teacher Conclusion: Gaining Education is mandatory for each individual. Educated persons established Society and Nation. But Education and knowledge can only be gained through Teachers.

**Keywords:** Dynamic, Ethical Development, Civilization, Enthusiasm, Nation builders.



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# **SCIENTIFIC SESSION 5A**

## **English Language**

### **Session Chair:**

**Dr Sabahat**

University of Education

### **Session Co. Chair:**

**Dr Qasim Shafiq**

Department of English Languages and Literature, TUF

### **Keynote Speaker:**

**Prof. Dr Mazhar Hayat**

Dean Faculty of Social Sciences

Riphah International University, Faisalabad Campus

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## **A Comparative Eco-Theological Study of Gauhar's No Space for Further Burials and Atwood's the Year of the Flood**

Author: Nida Khalid

### **Abstract**

Islam and Christianity, the dominant religions in the world, preach the premises concerning environmental parameters to understand the environmental challenges. The question of how these religions interact with the environment and society helps us understand the relationship between people and their surrounding worlds. This study examines the religious beliefs of people and their environment, and their effects on each other, the geographical locations, religious traditions, and academic fields of different milieus. With Plum Wood's 'value dualism' and Fauconnier and Turner's 'blending theory', this study illustrates how different ecological interpretations of the religions are being put together to create new narratives that address the relationship between religion and the environment in the post-war social order that navigate the effects on the atmospheric conditions of the area, exerting influence on the atmosphere, water networks, animal and human health, bird migration, food production, and agriculture. This study delimits *No Space for Further Burials* (2007) by Feryal Ali Gauhar and *The Year of the Flood* (2010) by Margaret Atwood to examine the relationship between militarism and neo-colonial capitalism, which when combined with the current social and political dualisms, systematically work together to rob third-world countries' natural resources and plunge them into environmental instability, hence, focuses on how the nuances of religious and eco-critical epistemology address environmental deterioration and degradation.

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## **Gendering the Religion: An Islamic Feminist Study of The Holy Woman By Qaisra Shahraz**

Author: **Shazia Ijaz**

### **Abstract**

The current research discusses the genderization of religion and its use as a patriarchal tool to make women submissive in a phallocentric society. In Pakistan, the geographical culture has become dominant over the true nature of Islam which is parental whereas the cultural impact has made it patriarchal. The researcher has analyzed The Holy Woman by Qaisra Shahraz with the application of Norman Fairclough's theory and Jacques Derrida's deconstructionist approach to figure out how the selected novel explores the discourses and influences that help patriarchy use religion to set phallocentric norms. The researcher has figured out through the analysis of The Holy Woman that religion has been used as a tool to make women submissive as Zarri Bano was made Shahzadi Ibadat by force. She wants to marry Sikandar but her father and other male members make her Shahzadi Ibadat against her wishes and desires just to keep their lands and property within their own power. The culture of Pakistan has become dominant over religion due to patriarchy. Theoretical stances of Asma Barlas and Amna Wadud have been applied for the analysis of the selected text. The instruction in The Holy Quran are both for men and women but the interpretations are made by the male authors. Asma Barlas and Amna Wadud have emphasized the importance of interpretations from the point of view of female too. This study has explored how culture of Pakistan has used Islam as a patriarchal religion to get their ends and its parental nature has been removed. The research has explored why Muslim societies are not following true Islam and they are following the Patriarchal setups of their cultures.

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# Hybridity in Twenty First Century: An Analysis of Techno-Human Post Cyberpunk Fiction

Author: Fauzia Amin

## Abstract

Technological advancement of Twenty first century has altered human ontology to an extent that "... technology and humans are no longer so dichotomous" (Bukatman, 1993, p.5-7). Although technology reigns as a new world order, the need of the hour is to avoid technophobia to establish a more democratic outlook to prevent humanity from being relegated. The current scenario requires a middle way to procure humanity a palpable existence in the world reigned by technology. This study identifies in Post Cyberpunk literature a linkage where humans and technology are incorporated to form a new hybrid identity, constituted in the merger of human and technology. The term hybridity propounded by Homi.K.Bhabha has been associated with dual human identity that works to decenter any essentialist ideology. The term has long been associated with the dichotomy of colonizer and colonized. This Study seeks a different outlook towards hybridity that is pertinent to contemporary post human scenario. Here I endeavor to deconstruct the empiricism related to humanism and Technology to mediate both purposefully. In Techno-human post cyberpunk literature this study offers a new merger that paves way to "third space of enunciation" (Bhabha:1994: p.37) projected by Bhabha in his work *The Location Of Culture*(1996). Bhabha's theory fosters the politics of inclusion rather than exclusion that "initiates new signs of identity, and innovative sites of collaboration and contestation." (Bhabha 1994: p.1) Presenting technology more grounded in human reality, post- cyberpunk narratives establish a linkage between technology and humanism which connect both in a very pertinent way to foster new forms of knowledge in posthuman scenario.

**Key Words:** Hybridity, Techno humanism, Post Cyberpunk fiction.



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## Market Realism in World Literature

Teaching at Columbia University over the past quarter-century has not only given me the opportunity to refine ideas on reading world literature; it has brought the world into my classrooms. (David Damrosch)

From New York to Beijing, via Moscow and Vladivostok, you can eat the same junk food, watch the same junk on television, and, increasingly, read the same junk novels . . . instead of 'socialist realism' we have 'market realism'. (Tariq Ali)

Author: **Prof Dr Mazhar Hayat**

### Abstract

Works of world literature have enormous potential to transcend historical and cultural boundaries to pave way for international cultural exchange. They also offer the readers a vast set of aesthetic and cultural experiences and pleasures of the remote past. However, a survey of the historical evolution of the discipline of world literature informs that world literature which commenced as an academic discipline to promote planetarity through literatures of various regions and cultures has virtually become Euro-centric – a tool to project West as a cultural grid and rest of the world as a periphery. For works of literature to seek international reception and access to Western publishing centers, they have to earn western readership by following their tastes and adopting their angle of looking at the non-European societies. Non-European writers in reality indulge in a kind of cultural bargain in return for access to western markets. Consequently, Comprador writers and their works gain international fame even if they are of little cultural significance. So, world literature has become more a source of cultural homogenization and its circulation rather than international cultural exchange. In reality, market realism is more pervasive than socialist and cultural realism. However, in globalised as well as glocalised world of today, literary horizon is increasingly expanding beyond binaric yardsticks. While this research article investigates how Euro-centric circulation of literature has affected the growth of a genuine international cultural exchange in world literature, it also aims to explore the ways in which the works of world literature can best be circulated and read, particularly the representative literary works of non-generic cultures.

**Keywords:** cultural exchange, market realism, glocalisation, comprador writers, binaric



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# **SCIENTIFIC SESSION 5B**

## **Education**

### **Session Chair:**

Dr Syeda Samina Tahira  
Department of Education, UAF

### **Session Co. Chair:**

Dr Dawood Ahmad  
Department of Education, TUF

### **Keynote Speaker:**

Dr Rana Muhammad Dilshad  
Chairman, Department of Education BZU, Multan

### **Guest Speaker:**

Dr. Laila Murtadha Baqer Mohebi  
College of Education, Zayed University, UAE

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## Assessment of integration of STEAM in Teacher Education Programs Offered through Distance Learning

Authors: Ishrat Fatima, Dr Dawood Ahmad

### Abstract

This study focused on how science, technology, engineering, arts and mathematics (STEAM) may be incorporated into courses and provided potential science teachers with information on STEM and distance learning. On the other hand, a research study was carried out that combined online learning with STEAM education. 328 aspiring science teachers who were taking a university course on fourth grade made up the study group for this investigation. Two groups one experimental and the other control of these students were randomly formed. Although the experimental group obtained their teaching via remote learning and STEAM education, the investigation was conducted in the laboratory science course. Regular instruction was given to the control group. Implementing the in question application was supported by a quasi-Experimental investigation. The research was completed in the autumn of 2020–2021. The participants went through a reliable and accurate assessment of their level of learning before to applying. Due to the application, there was a substantial difference between the students in the experimental group and the control group, favoring the experimental group where STEAM Education and Distance Education were applied. These findings added to the research findings that STEAM education and online learning were helpful in raising the achievement of university teacher candidates.

**Keywords:** STEAM, Distance Education Integration, Success, Science Teacher Candidate

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# Analyzing the Diversity and Inclusivity of content available on the Youtube Kids App, Considering Different Cultures Languages and Perspectives

Authors: Muhammad Azeem Sarwar, Dr. Dawood Ahmad

## Abstract

The YouTube Kids App has emerged as a prominent platform for both entertainment and educational purposes, serving as a digital playground specifically designed for children within the context of our contemporary technologically oriented society. The primary objective of this study is to effectively investigate the prevailing research issue by undertaking a comprehensive qualitative examination of the content available on the YouTube Kids App. The research investigates cultural and linguistic representation, evaluates the inclusivity of content for children from diverse backgrounds, and explores the impact of exposure to diverse content on children's cognitive development and social understanding. This study probes the complex relationship between content creation and consumption within the YouTube Kids app, utilising qualitative research methods such as content analysis and in-depth interviews. This study offers valuable insights that can serve as guidance for content creators, parents, and policymakers in fostering a digital media environment that is both diverse and inclusive for young users. This, in turn, will contribute to the promotion of cross-cultural understanding and empathy.

**Keywords:** YouTube Kids App, inclusivity, content analysis, cultural perspectives, linguistic diversity, cross-cultural understanding.

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# Factors Affecting the Integration of Steam Education in Pakisastani Education System

Author: Dr. Qaisar Abbas

## Abstract

STEAM (Science, Technology, Engineering, Arts, and Mathematics) is an educational approach that aims to develop students' STEAM skills in order to meet the global workforce demands. This research was conducted to examine the school leaders' perspectives about the various factors affecting the integration of science, technology, engineering, arts, and mathematics (STEAM) education in the Pakistani education system. The study was descriptive, in which quantitative data were obtained from the respondents. All the leaders of public secondary schools in Shikarpur District were the population. A sample of 100 leaders (50 male and 50 female) was selected through a simple random method. An instrument in the form of a questionnaire based on a five-point Likert scale was developed, and the same was used for data collection. Before the application of the said instrument, its validity was confirmed through experts' opinions, and a pilot study was conducted for the confirmation of reliability. The reliability of the instrument occurred ( $\alpha = .87$ ). The researcher collected data from the respondents, and the same was analyzed in SPSS (version 26) for calculating mean scores, frequencies, and percentages. A t-test was also used to investigate the differences among the leaders. This study revealed that the majority of the school leaders agreed regarding the factors influencing the integration of STEAM education in the Pakistani education system, such as lack of resources and infrastructure, ineffective teacher training, traditional teaching methods, cultural barriers, lack of awareness, lack of budget, traditional testing system, limited collaboration with industry, language barriers, and lack of clear guidance in policy and curriculum. Male leaders were agreed at a higher level as compared to female leaders. This study recommends that policymakers minimize the said factors in order to ensure the effective integration of STEAM education in the Pakistani education system.

**Keywords:** Factors, integration, STEAM education, secondary school leaders, Pakistani education system

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# **SCIENTIFIC SESSION 6A**

## **Biotechnology**

### **Session Chair:**

**Prof Dr Shahid Mehmood Baig**  
Chairman Pakistan Science Foundation

### **Session Co. Chair:**

**Dr Shaista Shafiq**  
PhD (Australia)  
Head- Department of Biotechnology, TUF

### **Keynote Speaker:**

**Dr Fateha Mubeen**  
Deputy Chief Scientist, NIBGE

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# **Production, Isolation and Functional Characterisation of A Recombinant Fibrinolytic Protein 'Lumbrokinase' For Potential use in Cardiovascular Diseases**

Authors: Ghausia Aziz, Ghulam Mustafa, Muhammad Sarwar Khan, Faiz Ahmad Joyia

## **Abstract**

Cardiovascular Diseases (CVDs) are the ailments of blood vessels and heart. The casualties due to CVDs are increasing so rapidly that it has become the most leading cause of deaths throughout the world i.e. 20.5 million in 2021. Certain factors exaggerate the risk of CVDs. These exaggerating issues are smoking, diabetes, lifestyle, high blood cholesterol, socio-economic stress, age, inheritance, gender and race and ethnicity. Different medicines are available in market for the treatment and management of CVDs and related problems. These include blood thinners, Beta blockers, ARBs, vasodilators, Calcium Channel blockers, Cholesterol-lowering drugs and most frequently fibrinolytic agents. Fibrinolytic therapy is mostly devised in the cases of acute Myocardial Infarction (MI) and Stroke. Potent fibrinolytic agents as streptokinase, tissue Plasminogen activator, reteplase, urokinase and nattokinase are being administered in different areas of the world. Number of draw backs are being reported during the use of these drugs as systemic lysis, hypotension, hypertension and high cost. In order to cover up the reported disadvantages, a novel fibrinolytic protein from the intestinal lining of earthworms has been identified and named as Lumbrokinase (LK). It is a group of six protease enzymes exhibiting fibrinolytic activity. Lumbrokinase-6 (LK-6) is the most active of all. Here we report the expression, isolation and functional characterization of recombinant LK-6 from E. coli. For this purpose, codon optimized gene of LK-6 was expressed in bacterial strain BL21. Expression and the molecular size of LK-6 were confirmed by SDS-PAGE that was around 31KDa. The LK-6 was purified using column chromatography and tested for its activity, specific activity and protein contents. Whole blood clot lysis assay showed the fibrinolytic activity of purified LK-6 as 65% as compared to commercial LK. Purified LK-6 remained active over a broad range of temperature (25°C to 50°C) and pH (3-9). In-vivo studies in mice also confirmed the fibrinolytic activity of rLK-6 and showed 64% reduction in clot as compared to non-treated groups. PT, APTT and TT readings also indicated that rLK-6 has increased the blood clotting time.



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# Metabolic Engineering of *Aspergillus niger* by CRISPR-Cas for Enhanced Cellulases Production

Authors: Anam Ijaz, Riffat Seemab, Muhammad Rizwan Javed

## Abstract

Filamentous fungi have immense potential to produce valuable proteins, enzymes, organic acids, and secondary metabolites having significant industrial applications. Among several fungal species, *Aspergillus niger* that is Generally Recognized as Safe (GRAS), has been extensively employed to produce carbohydrate-active enzymes (CAZymes). These enzymes (exo-; endo-glucanases and  $\beta$ -glucosidases) play a crucial role in the breakdown of lignocellulosic biomass and exhibit diverse industrial applications such as in food and feed, pulp and paper, textile, detergents, biochemical and biofuel industries. The CRISPR-Cas9 (Clustered Regularly Interspaced Short Palindromic Repeats/CRISPR-associated nuclease9) system has taken the world of genome editing by storm in recent years. Its popularity as a tool for altering genomes is due to the ability of Cas9 protein to cause double-strand breaks in DNA after binding with short guide RNA molecules, which can be produced with comparatively less effort and expense than classical genome engineering methods. In the current study, the CRISPR-Cas9 genome editing system has been optimized to engineer the genome of *Aspergillus niger* for improving the cellulases enzyme titre by targeting its transcriptional factor. A vector consisting of AMA1-based autonomously replication system, hygromycin (hph) resistance marker, and codon optimized Cas9 gene for *A. niger* was used. Gene specific gRNA for transcriptional factor gene was designed and transformed into *A. niger* protoplasts to introduce mutations/silencing of the repressor gene (transcriptional factor) to inhibit catabolite repression. Successive mutants showed approximately two-fold increase in cellulases production under submerged fermentation on wheat bran as a substrate. The selected mutant ( $\Delta$  repressor gene) was able to yield specific enzyme production with an avicelase activity of 489 IU/mg, a CMCase activity of 113 IU/mg, and a  $\beta$ -glucosidase activity of 3502 IU/mg protein. It is expected that the findings will impact several areas of industrial biotechnology, such as the development of new strains for the expression of heterologous enzymes, discovery, and improvement of metabolic pathways.

**Keywords:** *Aspergillus niger*; GRAS; Repressor gene; CRISPR-Cas9; Cellulases.

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## **Biofertilizers and Biopesticides: Tiny creatures for sustainable agriculture**

Authors: Fathia Mubeen, Sumera Yasmin, Asma Imran, M. Imtiaz, M. Usam Marghoob, Aniq Nawaz, Aysha Ikram, Sumaya Sana, M. Hussnain Azam, M. Nabeel, Abdul Rauf, Anjum Fraz, Sofia Hayat, Subaika Mehmood, Iqra Fatima, Fatima Farooq, Sabahet Jalal, Komal shoukat, Sana Munir, Zia-ul-Qamar

### **Abstract**

Biofertilizers and biopesticides serve as an eco-friendly substitute to toxic chemicals and form an important component of integrated nutrient management system. Efficiency of both biopesticides and biofertilizers can be increased by molecular approaches. This seminar will highlight the role of biofertilizers and biopesticides in crop improvement and hence achievement of sustainable agriculture. Avirulent opportunistic plant symbiotic fungi especially *Trichoderma* spp. are, widely used as plant growth enhancers as well as antagonistic fungal agents against several pests and diseases. The plant-*Trichoderma* symbiotic association leads to the acquisition of plant resistance to pathogens, improves developmental processes, yield, absorption of nutrient and fertilizer use efficiency. *Trichoderma* spp. have widely been used in agriculture and industry for production of many important commercial enzyme. This presentation will sum up the research work carried out for the utilization of *Trichoderma* spp., as biocontrol and growth promoting agent, and the development of a feasible process for the production of ecologically-safe *Trichoderma* based bioformulation for field application.

The foremost inducement of soil salinization in arable lands is climate change and other related factors including technological, industrial, and agricultural advancements and anthropogenic activities. A substantial decrease in crop production is caused by soil salinity, as it contributes significantly to the reduction of plant growth and yield. NIBGE has developed a sustainable Bioinoculant specific for saline soils which is comprised of halotolerant plant growth-promoting rhizobacteria and fungi.

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## Transgenic Crops: recent Trends and Future Prospects

Authors: Ghulam Mustafa, Faiz Ahmad Joyia, Aqsa pervaiz, Muhammad Sarwar Khan

### Abstract

Global population is increasing at a high pace, which demands at least 70% increase in food production by 2050. Adoption of innovative technologies and development of high yielding varieties are the only hopes to fulfill these requirements. Transgenic technology has high hopes as is the only way to combine genes across the species. The technology has proved its worth and more that 195 million hectares of the agricultural land in under transgenic crops. The dominant engineered traits are herbicide tolerant and insect resistant crops, The technology has now been extended to improved nutritional values, production of therapeutics, vaccines, enzymes, increased biomass production and even for the and other compounds of industrial importance. In our country crop plants have been engineered for different valuable traits, yet adoption of GMOs is slower and only 2.5 million hectares of the area is under transgenic crops. Recent interventions have addressed the existing limitations in the development and commercialization of GMOs and more than 40 research institutes are working on different crops. Hence, transgenic technology has evolved as the only hope for 2nd green revolution, fulfilling the food demands of 8 billion people worldwide. Genome editing is another emerging innovation of the current millennium that has potential to uplift crop health to great extent. This cutting-edge technology in combination with speed breeding, computational biology, NGS and other scientific interventions have paved way to develop crop plants having potential to meet demands of future generations.

**Keywords:** Transgenic crops, valuable traits, gene revolution, sharply increasing population, food shortage



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# **SCIENTIFIC SESSION 6B**

## **Optometry**

### **Session Chair:**

**Prof Dr Asad Aslam Khan (S.I.)**  
WHO National Coordinator for prevention of blindness

### **Session Co. Chair:**

**Dr Memoona Arshad**  
Phd(Optometry) , FBCLA, FIACLE,  
The University of Faisalabad

### **Guest Speaker:**

**Mr. Ubaidullah Jan**  
HoD Optometry, Superior University, Lahore

### **Invited Speaker:**

**Dr Adnan Khan**  
Weill Cornell Institute, USA / Khyber Medical University

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## **Faculty Development of Allied Health Professionals Regarding Instructional Methods in Medical Education**

Author: **Muhammad Iqbal Javaid**

### **Abstract**

This is important to familiarise the concepts of medical education among AHP's as a need of modern era of medical teaching.

Allied health professionals are crucial part of the health system globally and provide health facilities to the patients in preventive, diagnostic, curative and rehabilitative services. In Pakistan, the subject of medical education is provided with limitations for only for medical doctors and the allied health professionals are deficient regarding teaching methodologies, curriculum development, assessment techniques, learning behaviour, and presentation skills.

Universities / Institutions are offering medical teaching courses (CHPE), (CMT), (PGD), (MME), and (PhD) for faculty development. The courses are necessary now to enter in medical teaching and for promotion also as directed by PMDC and CPSP for medical doctors only, while Allied Health Professionals are not beneficiary for the courses in the absence of additional benefit for promotion or hiring for any senior post. AHP's may be benefitted in teaching skills and professional development as faculty.

This is suggested to gain knowledge of teaching skills, curriculum development, assessment methodologies and presentation skills for AHP's, through these courses. So this is a need to familiarise the importance of medical education as they have to deliver the knowledge along with clinical skills, and latest concepts and ideas are necessary to fulfil the requirement of modern techniques & methodologies in medical teaching.

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# In vitro optimisation of Silicon quantum dots for bioimaging of tear film

Author: Sidra Sarwat

## Abstract

### Background:

Tear film is crucial in dry eye disease (DED). However, the knowledge of tear film dynamics must still be fully understood. Silicon Quantum dots (Si-QDs) can potentially monitor tear film dynamics. QDs are nanocrystals with tunable size (2-10 nm), bright fluorescence, more photostability and reduced quenching in biological systems. These features have increased their application as high-contrast ophthalmic labels. This study outlines the fluorescence and cytotoxicity of Si-QDs for eventual application as a biomarker for studying the tear film dynamics.

### Methods:

Hydrophilic Si-QDs were synthesised and characterised by transmission electron microscopy and a Spectrofluorophotometer. QDs were investigated for fluorescence detection limit by exposing them to artificial tears using a slit lamp biomicroscope combined with Zyla sCOMS camera. Cytotoxicity of QDs (250-1  $\mu\text{g/mL}$ ) was assessed using human corneal epithelial cells with MTT assay after 24 hours of exposure.

### Results:

Si-QDs had an average size of  $2.65 \pm 0.4$  nm, desirable for fluorescence. Si-QDs showed a peak fluorescence emission of  $170.85 \pm 19.5$  RFU for five repeated measures. The fluorescence remained stable even at 0.01  $\mu\text{g/mL}$  ( $p=0.15$ ). However, Si-QDs tend to aggregate and show dispersed fluorescence at 16  $\mu\text{g/mL}$  and above concentration. Si-QDs showed cell viability of  $>97\%$  at 16  $\mu\text{g/mL}$  and below.

### Conclusions:

The optimal size, fluorescence emission and cytotoxicity demonstrate the use of Si-QDs for bioimaging the tear film. This research project will benefit the industry by developing novel drug delivery systems for dry eyes. However, further investigations are required for preclinical in vivo cytotoxicity.

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## Effect of Rgp Lenses and Keratoconus

Author: **Shahid Noor**

### Abstract

**Introduction:** Keratoconus is a chronic, advanced corneal thinning with central or paracentral steepening, causing progressive vision loss. This study aimed to investigate the effect of RGP lens fittings on visual function and quality of life in keratoconus patients.

Rigid gas permeable lenses (RGPs) enhance visual performance in keratoconus by improving visual acuity, contrast sensitivity, and corneal shape stabilization, minimizing the need for more intrusive therapies, hence improving patients' quality of life, visual comfort, and satisfaction.

**Methods:** In an Analytical monocentric observational study, 36 keratoconus patients of both genders aged between 18-36 years with no infectious and inflammatory diseases were enrolled between October 2022-May 2023 at Eye 2 Eye Vision Centre, Lahore. Visual acuity, contrast sensitivity, stereopsis, and colour vision were measured using Logmar, Pelli Robson, and D-15 chart respectively and quality of life score were assessed by the National Eye Institute Visual Function Questionnaire with and without corneal and scleral RGP lenses.

**Results:** Effect of corneal and scleral RGPs was determined in 72 eyes of 36 keratoconus patients. Visual acuity, contrast sensitivity and stereopsis with RGP ( $0.09 \pm 0.105$ ,  $1.68 \pm 0.171$ ,  $2.05 \pm 0.820$ ) was significantly better than without RGPs ( $0.86 \pm 0.105$ ,  $0.77 \pm 0.283$ ,  $1.00 \pm 0.411$ ,  $P < 0.001$ ).

Visual acuity and quality of life with corneal RGPs ( $0.0806 \pm 0.09508$  and  $92.1667 \pm 5.94499$ ) had no significant difference with scleral ( $0.1111 \pm 0.11409$ ,  $90.3333 \pm 8.23234$ ) but contrast sensitivity in corneal RGPs ( $1.7417 \pm 0.18381$ ) was better to scleral ( $1.6292 \pm 0.13958$ ,  $P = 0.005$ ).

**Conclusion:** Corneal and scleral RGPs enhanced visual acuity and stereopsis except for contrast which was better in corneal ( $P = 0.000$ ). Quality of life was better from ascending to descending order as per stages of keratoconus (0,1,2,3,4) as 24,28,14,4,2 respectively.

**Keywords:** Corneal RGPs, Contrast sensitivity, Keratoconus, Visual Acuity, quality of life.



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# Challenges and possibilities in “STEAM” infused optometric practices

Author: Ubaid

## Abstract

Through the incorporation of STEAM (science, technology, engineering, arts, and mathematics) into conventional practices, this talk explores the dynamic environment of optometry. With this integrative approach, optometric specialists are confronted with more and more opportunities and challenges. The swift advancement of technology, obtaining essential education and training, controlling expenses and assets, proficiently conveying technical information to patients, and cultivating interdisciplinary cooperation are among the obstacles to be overcome. On the other hand, the opportunities are equally attractive. Personalized treatment plans result from the accurate identification and management of eye problems made possible by the integration of sophisticated diagnostic tools. Combining technology and the arts creates new ways to engage patients and improve their understanding of eye health and available treatments. By working together on collaborative research initiatives, optometrists may further the field's innovation culture and make significant strides in eye care. Furthermore, the integration of STEAM fosters innovative and artistic approaches to the design of eyewear that take into account both personal taste and functionality.

## Conclusion:

Although there are obstacles to overcome while integrating STEAM into optometry practices, there are significant potential advantages. The proactive approach to continuous education, multidisciplinary cooperation, and the investigation of novel prospects emerging from the convergence of science, technology, engineering, arts, and mathematics in the field of optometry can do miracles in terms of best practices and advancement in the field of optometry.



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# **SCIENTIFIC SESSION 6C**

## **Pharmacy**

### **Session Chair:**

**Dr. Saadullah Malik**

Department of Pharmaceutical Chemistry,  
Faculty of Pharmaceutical Sciences GCUF

### **Session Co. Chair:**

**Dr Aamna Habib**

Principal, Madinah Collage of Pharmacy, TUF

### **Keynote Speaker:**

**Dr Uzma Ali**

Wissenschaftliche Mitarbeiterin,  
Hamburg Medical College Germany

### **Guest Speaker:**

**Dr Muhammad Majid Aziz**

School of Pharmacy, Xi'an Jiaotong University, China

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# Pharmacy profession in Pakistan: Current challenges and mitigations

Authors: Dr. Muhammad Majid Aziz, Muhammad Nafees

## Abstract

The pharmacy profession in Pakistan confronts a myriad of academic and professional challenges, reflecting a transitional stage in its evolution since the country gained independence in 1947. Academically, the sector grapples with an uneven examination system, demanding a centralized approach for uniformity across public and private institutes. Admission criteria discrepancies further exacerbate the situation, necessitating the development of a standardized and transparent system overseen by the Pharmacy Council of Pakistan (PCP) and Higher Education Commission (HEC).

A critical gap in the academic landscape is the absence of a national pharmacy university, emphasizing the need for collaborative initiatives between the government, HEC, and Ministry of Health to establish such an institution. The scarcity of qualified faculty, particularly in pharmacy practice, calls for specialized training programs and the engagement of foreign experts to address the famine of educators. Training facilities, including the integration of clinical training after the Pharm-D degree, face challenges due to economic feasibility concerns.

The proposal to split pharmacy education into two distinct realms, namely Pharm-D (Pharmaceutical Technology) and Pharm-D (Clinical), aims to enhance specialization and productivity in the pharmacy profession. Curriculum stagnation is evident, with revisions occurring infrequently despite a committee's recommendation for a triennial assessment.

On the professional front, pharmacists encounter limited career choices, with government job opportunities being meager. Disparities in salaries across sectors, including pharmaceutical sales and marketing, pharmaceutical industry, and teaching, underscore the need for greater uniformity. The autonomy of pharmacists, especially in community settings, is compromised, with unqualified staff often managing community pharmacies. Furthermore, the shortage of pharmacy technicians relative to community pharmacies suggests a need for additional institutes offering pharmacy technician education to improve service standards.

In essence, the pharmacy profession in Pakistan is at a crossroads, requiring comprehensive reforms in academic structures, faculty development, and professional opportunities to ensure a robust and effective healthcare system. Coordination among regulatory bodies, educational institutions, and the government is imperative to navigate these challenges and elevate the standards of pharmacy practice in the country.

**Key Words:** Pharmacy Practice, Challenges and the Field of Pharmacy

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## **Development and evaluation of pH sensitive semi-interpenetrating networks: assessing the impact of itaconic acid and aloe vera on network swelling and cetirizine release**

Author: Dr Nyla Ajaz

### **Abstract**

Hydrogels are crosslinked three-dimensional networks, and their properties can be easily tuned to target the various segments of the gastrointestinal tract (GIT). Cetirizine HCl (CTZ HCl) is an antihistaminic drug, which when given orally can upset the stomach. Moreover, this molecule has shown maximum absorption in the intestine. To address these issues, we developed a pH-responsive semi-interpenetrating polymer network (semi-IPN) for the delivery of CTZ HCl to the lower part of the GIT. Initially, 10 different formulations of itaconic acid-grafted-poly (acrylamide)/aloe vera [IA-g-poly (AAM)/aloe vera] semi-IPN were developed by varying the concentration of IA and aloe vera using the free radical polymerization technique. Based on swelling and sol-gel analysis, formulation F5 containing 0.3%w/w aloe vera and 6%w/w IA was chosen as the optimum formulation. The solid-state characterization of the optimized formulation (F5) revealed a successful incorporation of CTZ HCl in semi-IPN without any drug-destabilizing interaction. The in vitro drug release from F5 showed limited release in acidic media followed by a controlled release in the intestinal environment for over 72 h. Furthermore, during the in vivo evaluation, formulation F5 did not affect the hematological parameters, kidney, and liver functions. Clinical observations did not reveal any signs of illness in rabbits treated with hydrogels. Histopathological images of vital organs of treated animals showed normal cellular architecture. Thus, the results suggest a non-toxic nature and overall potential of the developed formulation as a targeted drug carrier.

**Key Words:** Hydrogels, Itaconic Acid

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# Exploring the new opinion: A combination of in-vitro and computational effort to utilize soluplus® as mean of solubility enhancement by fabricating solid dispersion for Rosuvastatin Calcium

Authors: Sana Inam, Muhammad Irfan, Rabia Munir, Asma Ashraf

## Abstract

The purpose of this study is to investigate the structure-specific solubilization effect of soluplus on rosuvastatin calcium and to sightsee the experimental relationship with the aid of molecular docking. Rosuvastatin calcium is in a class of drug called HMG-CoA reductase inhibitors (statins). This research seeks to enhance the aqueous solubility and dissolution rate of rosuvastatin calcium (RoCa) by forming solid dispersion with amphiphilic polymer soluplus (SP). Firstly, molecular docking was conducted for the screening of polymer to formulate binary solid dispersion. The optimized amphiphilic polymer soluplus (SP) was used to prepare binary solid dispersion of RoCa in ratios of 1:1, 1:1.5, 1:3 and 1:6 by co-grinding and solvent evaporation methods. All the prepared SDs were characterized for solubility, drug content, in vitro-dissolution with successful achievement of the desired objective. The optimized formulations were further evaluated by solid state characterization such as FTIR, DSC, XRD, SEM and in vitro cytotoxicity. The interaction of RoCa with SP, predicted by molecular docking, was also experimentally evaluated and the results revealed the domineeringly favorable behavior of soluplus for boasting the solubility and dissolution of RoCa. However, the formulation RSE-5 showed remarkable increase of 17.60 folds in solubility and released 70.60% of drug within 5 minutes in contrast to pure RoCa (25.34%).). Additionally, PXRD and SEM suggested the conversion of crystalline drug into amorphous state. The prepared solid dispersion are highly stable in aqueous media, where its biological activity can be enhanced by increasing the solubility of RoCa.

**KeyWords:** Rosuvastatin calcium; soluplus; solid dispersion; Solubility; Docking;

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# **Methylation pattern and mRNA expression of synapse- relevant genes in the MAM model of schizophrenia in the time- course of adolescence**

Authors: Abdul Qayyum Khan, Lukas Thielen, Gwenaëlle Le Pen

## **Abstract**

Schizophrenia is highly heritable and aggregating in families, but genetics alone does not exclusively explain the pathogenesis. Many risk factors, including childhood trauma, viral infections, migration, and the use of cannabis, are associated with schizophrenia. Adolescence seems to be the critical period where symptoms of the disease manifest. This work focuses on studying an epigenetic regulatory mechanism (the role of DNA methylation) and its interaction with mRNA expression during development, with a particular emphasis on adolescence. The presumptions regarding the role of aberrant neurodevelopment in schizophrenia were tested in the Methyl-Azoxy-Methanol (MAM) animal model. MAM treatment induces neurodevelopmental disruptions and behavioural deficits in off-spring so the treated animals reminiscent of those observed in schizophrenia and is thus considered a promising model for studying this pathology. On gestational day-17, adult pregnant rats were treated with the anti mitotic agent MAM. Experimental animals were divided into groups and subgroups according to substance treatment (MAM and vehicle agent [Sham]) and age of analysis (pre-adolescent and post-adolescent). Methylation and mRNA expression analysis of four candidate genes, which are often implicated in schizophrenia, with special emphasis on the Dopamine hypothesis i.e., Dopamine receptor D2 (Drd2), and the “co-factors” Disrupted in schizophrenia 1 (DISC1), Synaptophysin (Syp), and Dystrobrevin-binding protein 1 (Dtnbp1), was performed in the Gyrus cingulum (CING) and prefrontal cortex (PFC). Data were analyzed to observe the effect of substance treatment between groups and the impact of adolescence within-group. We found reduced pre-adolescent expression levels of Drd2 in both brain areas under the application of MAM. The “co-factor genes” did not show high deviations in mRNA expression levels but high alterations of methylation rate under the application of MAM (up to ~20%), which diminished in the further time course, reaching a comparable level like in Sham control animals after adolescence. The pre-adolescent reduction in DRD2 expression might be interpreted as down regulation of the receptor due to hyper dopaminergic signalling from the ventral tegmental area (VTA), eventually even to both investigated brain regions. The notable alterations of methylation rates in the three analyzed co-factor genes might be interpreted as attempt to compensate for the altered dopaminergic neurotransmission.





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# SCIENTIFIC SESSION 7

## Physical Therapy

### Session Chair:

Prof Dr Ashfaq Ahmad

Dean Faculty of Allied Health Sciences, UOL, Lahore

### Session Co. Chair:

Dr Shahid Ahmad Heera; PT

Director Clinics & Allied Health Sciences, TUF

### Keynote Speaker:

Mr Mudassar Ahmad

NHS Specialist Commissioning Team  
(Surrey Heathlands) England UK

### Guest Speaker:

Dr Iqra Ishaq; PT

PhD Physical therapy,  
University of Technology Sydney, Australia

### Invited Talk:

Dr Muhammad Farooq Alvari; PT

Al-Noor Specialist Hospital,  
Holy Makkah, Kingdom of Saudi Arabi

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## **Spinal Cord injury Rehabilitation, (Brainstorming for Pakistan SCI survivors)**

Ahmed M (2023), Spinal Cord injury Rehab, A Brainstorming Exercise among Pakistan population, 05/12/2023.

### **Abstract**

Human Spine: a collection of 33 vertebrae, is commonly known as back bone. Although most adults only have 26 vertebrae, as remaining are fused together as we grow. With its 220 ligaments, 120+ muscles, 100+ joints and 35g weight, the Spine is the bony structure which protects the spinal cord & nerve roots. However, Spinal Cord is the extension of the brain, outside the cranium. Both structures; the Spine as well as the Spinal Cord, ensure stability, flexibility, and movements in human body. Whereas a trauma, disease, or inflammation of any of these, can cause a Spinal Cord Injury (SCI), which is a serious medical condition, often results in severe morbidity and permanent disability.

Pakistan: a South-Asian territory, is the sixth most populous country in the world. It is prone to several types of natural disasters, including earthquakes, floods, droughts, cyclones, and landslides. Most areas of Pakistan (Sindh, Punjab and Azad Jammu & Kashmir provinces) lie on the north-western edge of the Indian geological plate. Earthquakes: falling from height or objects falling from above, are among the major causes of SCI. It requires long term disability management at both an individual level as well as is a huge burden on the society. Loss of functional units in a country; healthy individuals of working age, is a never-ending dilemma for Pakistan. Lack of suitably qualified leadership, scarcity of financial resources, absence of well-equipped SCI rehabilitation centres, Pakistan has always been recognised among international cooperation organisations as well as NGO's. Lack of community education about self-care, disability management and social adaptations is another factor, Pakistan has ever grown list of disabilities among citizens ranging from physical handicap to psychological impairments.

In addition to 2005 Earthquake, the windstorm of 1965 in Pakistan remained the most fatal natural disaster in its history, claiming 10,000+ lives. However, the devastation of 2005, has eclipsed all previous disasters. This was the starting point; SCI awareness began across the country. However, 18 years later, Pakistan only has one specialist SCI disability management rehab centre in Hayatabad Peshawar. Whereas, many disabled individuals cross the country, keep waiting for miracles from out-of-date, non-evidence based, unscientific, fake healing techniques. There is a strong need to develop the quest of knowledge regarding SCI and disability management. This brainstorming should start at the clinicians' level in form of open discussion forums, seminars, awareness lectures, confidence building workshops among both the SCI survivors as well as clinicians providing education, treatment and care.

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# Comparative Effect of Post Isometric Relaxation and Static Stretching on Stride Length and Flexibility in Patients with Hamstrings Tightness

Authors: ALINA TARIQ MANN, RUBINA ZULFIQAR, ZAIN ALI

## Abstract

Flexibility of soft tissues is affected by sitting of longer duration. In hamstring tightness stride length decreases. In PIR by the contraction and relaxation method the lengthening of hamstrings occurs. Static stretching is beneficial in enhancing the hamstring muscles flexibility.

The objective of this study is to determine the comparative effectiveness of Post isometric relaxation and static stretching on stride length in students with hamstrings tightness.

A sample size of 44 with mean age of  $23.91 \pm 1.49$  years was included by simple random sampling. Subjects were included according to set inclusion and exclusion criteria. Data was collected pre and post treatment. Both the static stretching and PIR group were undergone two assessment tests 1) is active knee extension and 2) is straight leg raise (SLR) test. Stride length through pedometer was also measured before giving the treatment. In group A static stretching and in group B Post Isometric Relaxation technique (PIR) was given. In both groups 3 sessions in a week was given to subjects on alternate days and for 3 weeks. And after 3 weeks of session the post treatment readings were measured as same way as in pre-treatment phase. Statistical analysis was done by using SPSS 22 and the conclusion was made accordingly. After 1 month long term effect of treatment was checked.

The results of current study found that within group comparison of AKE test, SLR test and stride length which was done by using repeated measures ANOVA test have shown significant effects with  $p\text{-value} < 0.05$  in both groups with greater difference seen in SS group than PIR group. Between group analysis of AKE, SLR test and stride length has also shown significant results between two groups with  $p\text{-value}$  less than 0.05. Both SS and PIR are effective techniques to improving ROM, stride length and flexibility in hamstrings tightness patients but SS is better and effective technique as compared to PIR.

**Keywords:** Hamstring Tightness, PIR, Post Isometric Relaxation Technique, Static Stretching, Stride Length, Pedometer, Active Knee Extension Test, SLR Test

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# Comparative Effects of Instrument Assisted Soft Tissue Mobilization and Deep Transverse Friction Massage on Pain and Gait Parameters of Iliotibial Band Syndrome

Authors: MUHAMMAD HANAN ABDULLAH, MARIAM MEHMOOD, ASMA BAIG

## Abstract

Iliotibial band syndrome is frequently observed in healthy subjects with prolonged sitting (6 to 7 hours). Patients with the condition describe lateral knee pain brought on by activities. Diagnosis is primarily centred on a characteristic physical examination and history. ITBS occurs as a result of weak hip and gluteus muscles, loss of flexibility, excessive sitting, unbalanced leg lengths or any other inflammatory cause near lateral epicondyle. It can be primarily treated non-surgically; nevertheless, surgical intervention including release or excision of the distal part of iliotibial band is necessary in situations that are persistent or chronic.

The aim of the study was to compare the effects of instrument assisted soft tissue mobilization (ERGON) and deep transverse friction massage on pain and gait parameter among patients with Iliotibial band syndrome.

This randomized control trial study included a sample size of 24 patients with IT band syndrome. Subjects were obtained via clinical setup. After complete history, physical examination, determining the inclusion and exclusion criteria, informed consent was obtained from each subject. Subjects were divided in two groups IASTM group and DTFM group by purposive sampling technique by using lottery method. Pre and post treatment readings were taken from each subject for pain using numerical pain rating scale (NPRS), hip range of motion (abduction) and Q angle using universal goniometer respectively.

The findings of current study showed that within group comparison of NPRS, Hip abduction and flexion ROM and Q-angle shown significant effects in both groups with greater difference seen in IASTM group than DTFM group with p-value <0.05. Between group analysis of NPRS, Hip abduction and flexion ROM Q-angle have also shown significant results between two groups with p-value less than 0.05.

Conclusion of study was that both IASTM and DTFM are effective techniques to decrease pain, improving ROM and flexibility in iliotibial band syndrome patients but IASTM is better and effective technique as compared to DFM.

**Keywords:** Instrument assisted soft tissue mobilization, IASTM, Deep transverse friction massage, DTFM, iliotibial band syndrome, ERGON

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## Comparative Effects of Neuromuscular Retraining and Mime Therapy to Treat Synkinesis in Bells Palsy

Authors: AMINA MEHAK HASNAT, ANBREENA RASOOL, AYESHA NIAZ

### Abstract

Bell's palsy is an unexpectedly lower motor neuron damage of the facial nerve that causes asymmetry around the mouth, loss of the ability to close the eye, elimination of the nasolabial fold, and destruction of skin creases on the opposite side of the forehead. Bell palsy has a prevalence rate of 15 to 30 per 100,000 people. The study objective was to determine the Comparative effects of neuromuscular retraining and mime therapy to treat synkinesis in Bell's palsy. It was a Randomized clinical trial study conducted in 3 clinical hospitals of Faisalabad. 64 participants enrolled in the study by considering the inclusion and exclusion criteria were randomly allocated in two groups by lottery method. Group A received the electrical stimulation and Mime therapy while group B received the electrical stimulation and neuromuscular retaining. Outcome measures of this study were Synkinesis assessment questionnaire and House Brackmann facial grading scale that measured the synkinesis and paresis severity in Bell's palsy patients. Total treatment was of 4 weeks. Data was collected at baseline, after 2nd week and end of treatment at 4th week. Data was be analyzed by using SPSS. The mean age of participants was  $37.03 \pm 6.85$ . There was 28 male and 36 female in study. There was significant difference in effect of neuromuscular retraining along with electrical stimulation and mime therapy along with electrical stimulation at end of 4 week of treatment in reducing synkinesis ( $21.14 \pm 2.0$  mean rank 14.52 versus  $37 \pm 10.22$  mean rank 41  $P = 0.000$ ) and improve facial symmetry ( $1.07 \pm .267$  mean rank 17.93 versus  $1.89 \pm .567$   $P = .000$ ). Therefore neuromuscular retraining was more effective in reducing synkinesis and improving facial function in Bell's palsy patients. This study stated that neuromuscular re-training and electrical muscle stimulation had more beneficial effects as compared to mime therapy in decreasing synkinesis and return to normal, symmetrical facial function in Bell's palsy patients after 4 weeks of treatment.

**Keywords:** Neuromuscular Retraining, Neuromuscular Re-education, Mime Therapy, Bell's palsy

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# Effect of Kaltenborn Joint Mobilization along with Graston Technique on Pain and Gait in Patients with Plantar Fasciitis

Authors: SARWAT MEHMOOD, SUNDAS FAROOQ, ZAIN ALI

## Abstract

The foremost reason of heel discomfort, plantar fasciitis is thought to impact general population about 10% at certain point in the lives. In Pakistan, there is a 2.5% to 10% prevalence rate for plantar fasciitis, and 83% of patients are working full-time. Additionally, the recommended mode of intervention is variable, and PF therapeutic alternatives are still disputed.

The main intention of this clinical research was to evaluate the influence of the Graston technique in conjunction with Kaltenborn joint mobilization on range of motion, gait and pain, within the PF patients. The secondary aim of this research was to provide updated and high-quality treatment approaches for the management of Plantar Fasciitis to both healthcare professionals and patients.

The design was a randomized clinical trial. Screening was done conferring to the defined exclusion and inclusion criteria. The sample size of 42 patients with PF were included. Participants were divided arbitrarily by lottery method into 2 sets. The group A (baseline treatment) and group B (baseline treatment with Kaltenborn joint mobilization), 21 participants in each group. The data was collected with the aid of three investigation tools Visual analogue scale for pain intensity, Rivermead visual gait assessment (RVGA) and goniometer for range of motion.

Between the group difference is significant for pain, ROM and gait  $p$  value  $<0.05$ . The study concluded that although Graston technique and Kalterborn joint mobilization both are effective techniques to decrease pain in patients with plantar fasciitis. But Graston technique along with Kalterborn joint mobilization is better and effective techniques in improving pain, ROM, and gait problems in patients with plantar fasciitis.

**Keywords:** Plantar Fasciitis, Graston Technique, Kaltenborn Joint Mobilization, Pain, Rivermead Visual Gait Assessment, Goniometer

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# **Comparative Effects of Carlo Perfetti Method and Proprioceptive Neuromuscular Facilitation Technique on Upper Limb Motor Function in Patients with Subacute Stroke**

Authors: HAFSA NAZ, SIDRA MAJEED, ANBREENA RASOOL

## **Abstract**

Stroke also known as CVA has caused many serious problems worldwide which includes: disability. Now a day's stroke has become the fourth leading cause of death. Treating stroke is a major area for many physiotherapists to work. Many different neurorehabilitation programs have been developed including Bobath, Proprioceptive neuromuscular facilitation and cognitive therapeutic exercises etc. The objective of this study was to evaluate the effectiveness of Carlo Perfetti method on improving motor function of upper extremity in subacute stroke patients. The study design was Randomized clinical trial. Total number of participants in this study were 32 patients of subacute stroke and taken from Allied hospital, DHQ and Faisal Hospital Faisalabad. Participants were screened out based on the inclusion and exclusion criteria. Participants were assigned into two groups, group A and group B by purposive sampling technique. Both groups treatment lasted for 30 minutes, and 3 times in week for 2.5 months and to reduce the biasness all the assessments done were blinded. Baseline treatment for both groups was electrical muscular stimulation. Group A was given Carlo Perfetti method, while Group B was given PNF. Data was calculated through SPSS 20. Friedman test was used to measure the difference within the groups with repeated measurements. Within group analysis showed significant relationship in both groups, A and B. Between group's analyses also showed the significant relationship in both groups. It was concluded that both Carlo Perfetti and PNF are effective treatments in treating upper extremity motor function but Carlo perfetti is better and effective method as compared to PNF.

**Keywords:** Carlo Perfetti method, stroke, cognitive therapeutic exercises, PNF, Neurorehabilitation, EMS

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# Effectiveness of Abdominal Activation on Motor Control in Spastic Diaplegic Cerebral Palsy

Authors: Lieza Iftikhar, Mariuam Zafar

## Abstract

CP is the disorder of nervous system manifested in movement, posture, muscle tone and functional activity. Spasticity is the most common problem related to CP. Neuro-developmental techniques is facilitation techniques were used to activate muscles and to reduce spasticity.

The aim of the study was to determine the influence of the effects of abdominal activation for correcting posture in spastic diaplegic CP children as well as to determine the change in gross motor function and reduction in muscle tone.

A quantitative, randomize clinical trial was conducted allocating patients randomly into two groups however; randomization of the patients in two groups was done.

One is control and other is the treatment group. Baseline treatment was given to the control group which included lower limb passive stretching exercises and interrupted direct current. However, baseline treatment with Neuro-developmental technique was given to the treatment group. The measuring tool use to for assessment was trunk control measurement scale to check postural correction and stability, GMFS 88 to check motor functions of lower limb, GMFS (level 1,2,3) for gross motor function, modified Ashworth scale to analyze spasticity

The study showed significant improvement in postural control, gross motor functions and spasticity of lower limb in children with cerebral palsy.

**Key words:** Cerebral palsy (CP), Neuro-developmental techniques NDT, Gross motor function measures, (IDC).



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# Comparing the Effects of Muscle Energy Techniques (Post Isometric Relaxation and Reciprocal Inhibition) On Hamstring Tightness and Anterior Pelvic Tilt with Knee Osteoarthritis: A Randomized Clinical Trial

Authors: Dr. Iqra Tahir, Dr. Marium Zafar

## Abstract

**Background:** Osteoarthritis is a degenerative chronic disease characterized by subchondral sclerosis, articular cartilage loss, marginal bone hypertrophy, and morphological and biochemical alterations in the joint capsules and synovium with a complex origin. This issue causes many complications among patients.

**Objective:** The objective of this recent study was to compare and evaluate the effects of two different muscle energy techniques (post-isometric relaxation and reciprocal inhibition) in improving hamstring flexibility, anterior pelvic tilt, functional status and pain reduction.

**Materials and Methods:** A single blinded, randomized clinical design was conducted. Patients from Madinah Teaching Hospital, District Headquarter, Allied and Aziz Fatima hospital were screened and 32 patients were allocated by convenient sampling into two groups. One group received baseline treatment (moist heat) and post isometric relaxation second group received baseline (moist heat) and reciprocal inhibition. Hamstring flexibility was checked by AKET, anterior pelvic was measured by calipers based inclinometer, functional status assessed by using WOMAC and pain was measured by visual analogue scale. Treatment was given for 4 weeks, 3 sessions per week. Pre, mid and post treatment. Data was analyzed through SPSS 20.

**Results:** PIR-MET and RI-MET group were significantly effective ( $p < 0.05$ ) in improving hamstring flexibility, anterior pelvic tilt, functional status and reducing pain. PIR-MET group was more effective compare to RI-MET.

**Conclusion:** In osteoarthritis patients, post isometric relaxation muscle energy technique was found to be more effective than reciprocal inhibition muscular energy technique in improving knee extension movement, anterior pelvic tilt, functional activities, and reducing pain.

**Keywords:** Knee Osteoarthritis, post isometric relaxation, reciprocal inhibition, hamstring flexibility, anterior pelvic tilt.

