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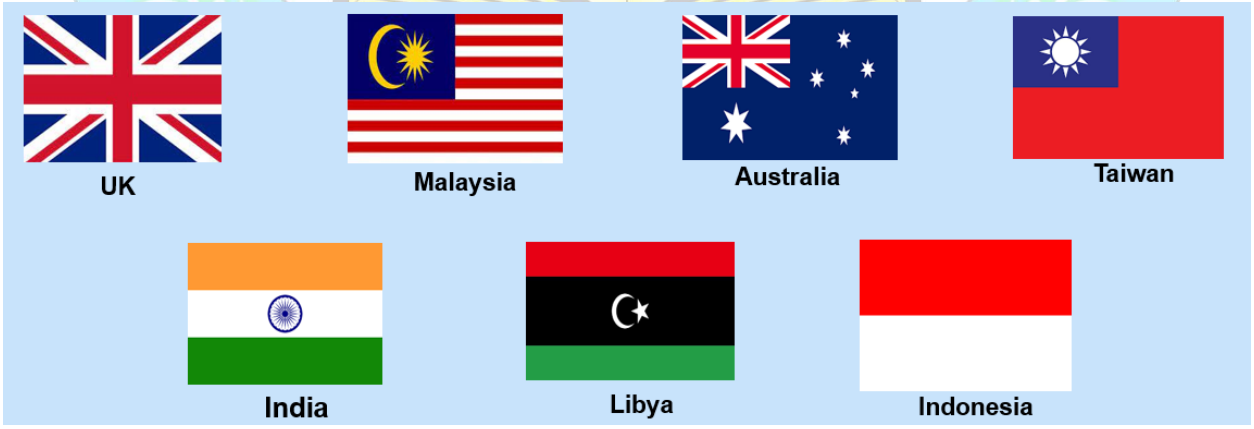

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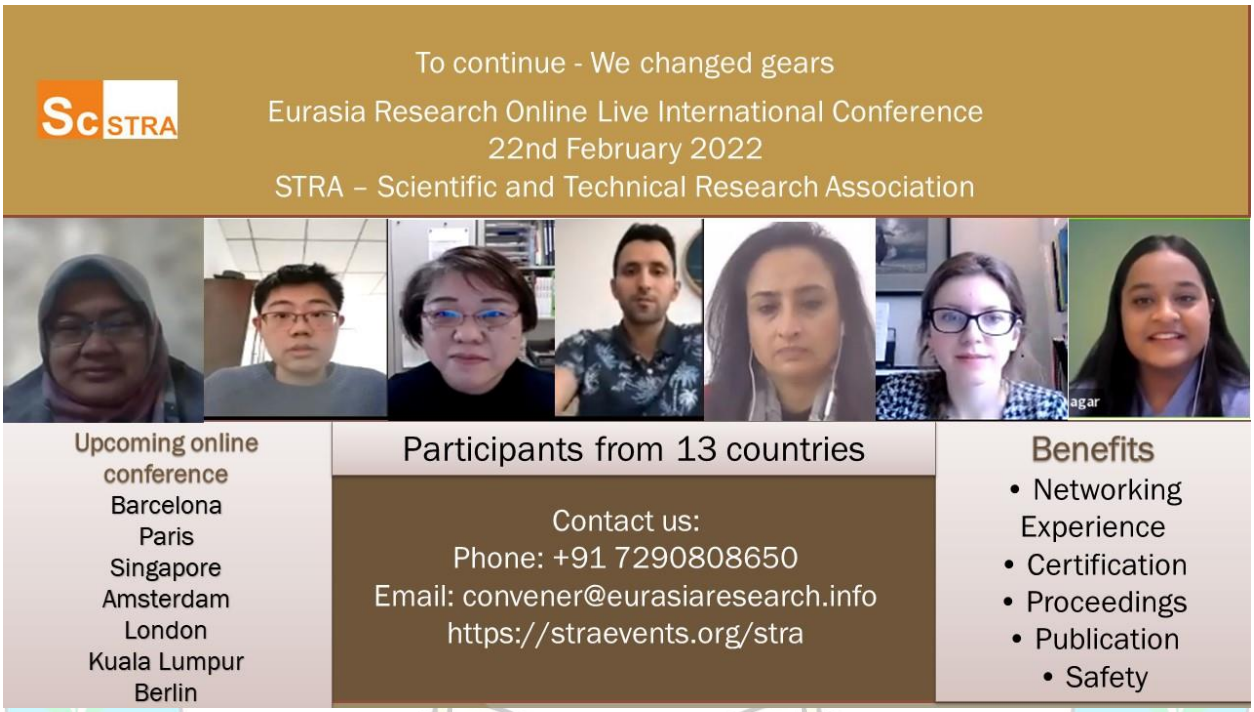

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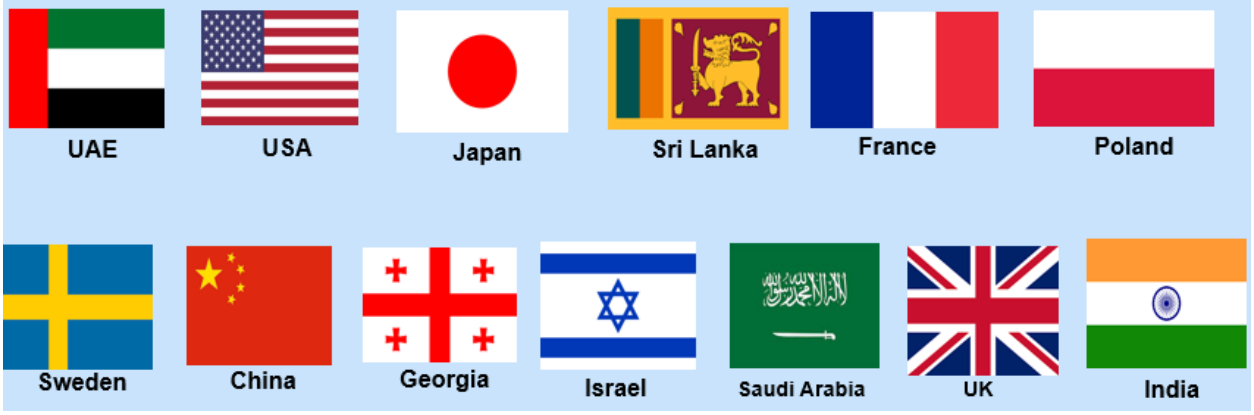

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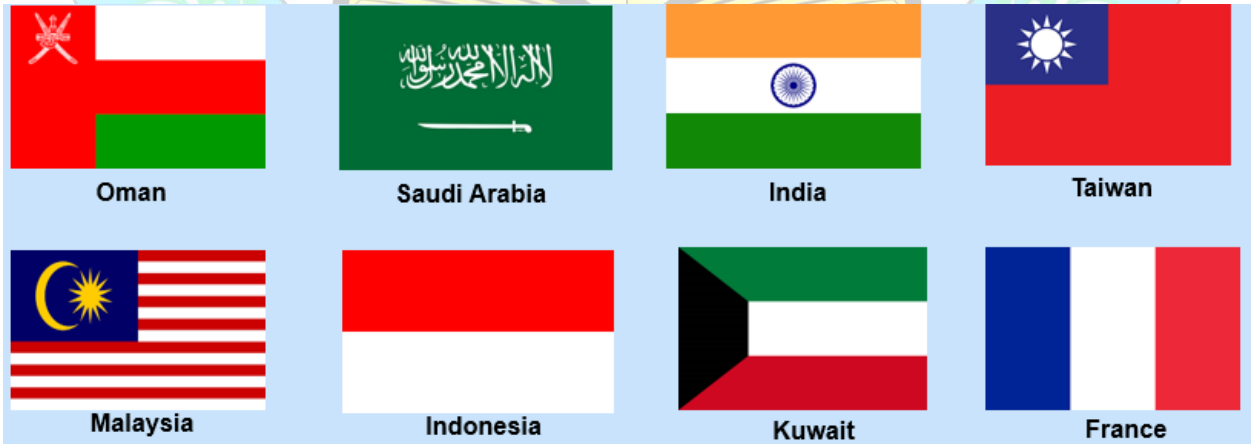

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Scientific and Technical Research Association (STRA) is an international community of researchers, practitioners, students, and educationists for the development and spread of ideas in the field of science and technology.

STRA is promoted by Eurasia Research. STRA aims to bring together worldwide researchers and professionals, encourage intellectual development, and treat opportunities for networking and collaboration. These objectives are achieved through academic networking, meetings, conferences, workshops, projects, research publications, academic awards, and scholarships.

The driving force behind this association is its diverse members and advisory board, who provide inspiration, ideas, efforts and drive collaborations. Scholars, Researchers, Professionals are invited to become a member of STRA and join this ever-growing network, working for benefit of society and research with the spirit of sharing and mutual growth.

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38	Dr. (Mrs) W. G. Samanthi Konarasinghe	Institute of Mathematics and Management, Sri Lanka

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Preface:

Scientific & Technical Research Association (STRA) is a conglomeration of academia and professionals for promotion of research and innovation, creating a global footprint. STRA aims to bring together worldwide researchers and professionals, encourage intellectual development and providing opportunities for networking and collaboration. These objectives are achieved through academic networking, meetings, conferences, workshops, projects, research publications, academic awards and scholarships. STRA strives to enrich from its diverse group of advisory members. Scholars, Researchers, Professionals are invited to freely join STRA and become a part of a diverse academic community, working for benefit of academia and society through research and innovation.

For this conference around 40 Participants from around 11 different countries have submitted their entries for review and presentation.

STRA has now grown to 16,450 followers and 9500 members from 85 countries.

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You can get our conference proceedings at: https://straweb.org/conference/proceedings/

We hope to have an everlasting and long-term friendly relation with you in the future.

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You will be able to freely communicate your queries with us, collaborate and interact with our previous participants, share and browse the conference pictures on the above link.

Our mission is to make continuous efforts in transforming the lives of people around the world through education, application of research & innovative ideas.

Editor: Dr. Anupam Krishna

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KEYNOTE SPEAKER

Dr. (Mrs.) W.G. Samanthi Konarasinghe

Academic Director, Statistical Consultant, Institute of Mathematics and Management, Sri Lanka

Topic: Importance of Econometric Modeling Amidst Covid -19

Dr. (Mrs.) W. G. Samanthi Konarasinghe, an award-winning Scientist has served as a Statistical Consultant and a Lecturer for more than two decades. She has developed various Mathematical and Statistical techniques to the world. The Circular Model (CM) and the Sama Circular Model (SCM) are two of the widely applied techniques whilst the Damped Circular Model (DCM) and Forced Circular Model (FCM) are the recently developed models. Dr. Samanthi has won the Best Paper Award from the International Conference on Advances in Mathematics, Computers & Physical Sciences and the International Conference on Business, Economics, Social Sciences & Humanities for her research findings. She was awarded the "IMRF BEST SCIENTIST AWARD, INDIA" for her invaluable contribution to the field of Statistics. She has been in constant demand due to her new findings, gets invitation from various destinations to share her knowledge as the keynote speaker, invited speaker etc. at international research forums in Thailand, Singapore, Malaysia, India and Australia. Also, she was the guest of honor and the chief guest of many international research forums. Dr. Samanthi is a multi-disciplinarian; has obtained Bachelor of Science Degree in Mathematics; Postgraduate Diploma in Industrial Mathematics; Master of Science in Applied Statistics, Master of Business Administration (MBA) and Doctor of Philosophy in Statistics. Also has the Diploma in Classical Music. She is a member of; American Statistical Association (ASA), Statistical Society Australia (SSA), Institute of Applied Statistics, Sri Lanka (IASSL) and National Science Foundation (NSF), Sri Lanka. She is the Editor in Chief of, Journal of New Frontiers in Mathematics & Statistics; Journal of New Frontiers in Economics & Business; Journal of New Frontiers in Healthcare & Biological Sciences; Journal of New Frontiers in Education & Social Sciences, published by Institute of Mathematics and Management of Sri Lanka. Also, an Editorial board member of American Journal of Theoretical and Applied Statistics (AJTAS). She is an Advisory Member Technical/ Scientific Conference Committee member of Scientific and Technical Research Association (STRA).

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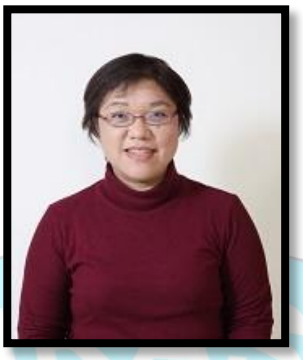
KEYNOTE SPEAKER



Dr. Yoshiko Yamaguchi
Home Care Nursing, Faculty of Nursing, Kwassui Women's University, Japan

Topic: Nurse Retention (E.G., Nurse Turnover, Nurses' Intention to Leave), Nurses' Stress (Work Stress, Family Related Stress, Stress Outcome), Employee's Work-Family Interface (Work-Family Conflict, Work-Family Enrichment)

Dr. Yoshiko Yamaguchi has received her PhD in. Kyushu University during the period of 2013-2016. Currently, she is working as research associate in Home Care Nursing, Faculty of Nursing, Kwassui Women's University, Japan. She has successfully completed her responsibilities as a reviewer of eighty-one research articles of twenty-four Journal from 2016-present. And she has been serving as an editorial board member of two Journal; LIFE: International Journal of Health and Life-Sciences and Journal of Practical and Professional Nursing and has been delegated vice president of Healthcare and Biological Sciences Research Association (HBSRA).

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KEYNOTE SPEAKER

Malini Nair

Co-Curriculum Chair for the Quality Program in the Business Division at Sharjah Women's Campus, United Arab Emirates

Topic: Innovation and lifestyle entrepreneurship: A study of lifestyle enterprises in the UAE

Malini Nair is a Business Faculty at the Higher Colleges of Technology. She teaches classes in Quality, Auditing, Innovation & Entreprenurship, Management and Leadership as well as Economics. She is interested in the use of interventions, technologies, and tools that facilitate group/team processes and lead to better task outcomes through Quality standards. She has developed and taught several courses related to Quality, HR, Innovation, Marketing and Economics to both MBA and undergraduate students. She is currently a member of the Program Advisory Committee for Quality at the University level. She is a Doctoral candidate pursuing her PhD in Business and Management. She has written several research papers and continues do so. She has received a SEED grant for one of her research papers. She is actively involved in Community projects and her forte is mentoring and encouraging her students to actively participate in these initiatives. Prior to her appointment as a faculty she has an immense amount of industry experience especially in the retail sector in the UAE. She studied Economics Honors and attended the prestigious Birla Institute of Technology (BIT) in India where she obtained her Master's degree in Business Administration. She went on to work as a Group HR Manager and continued to teach as she believes in sharing the knowledge gained through the industry. Her initiatives at the college level have been highly commended.

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KEYNOTE SPEAKER

Thillainathan Sathaananthan
Senior Lecturer attached to Department of Medical Education & Research, Faculty of Health-Care Sciences (FHCS), Eastern University, Sri Lanka

Topic: Consideration of practices of formative feedback

Thillainathan Sathaananthan is a Senior Lecturer attached to the Department of Medical Education & Research, Faculty of Health-Care Sciences (FHCS), Eastern University, Sri Lanka (EUSL), specialized in Chemistry (BSc), Education (MEd), Medical Education (MPhPh.D. PhD) and Criminal Law (LLM, LLB). Since the inception of the functioning of FHCS, he involved in the effective implementation of the modern form of integrated curriculum for MBBS and BSc. Nursing programs of FHCS. He was also titled as "Saiva Pulr' [Hindu Scholar] as he successfully completed a course in Hindu Philosophy and pass the examination. He developed a culturally sensitive blueprint for forma ative assessment called the cSEEFAR model to practice in an ethnically diverse environment when he did his Ph.D. at the University of Dundee, UK.

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KEYNOTE SPEAKER

Dr. Babasaheb Manik More

Professor in Engineering Physics, Dean, Research and Development Cell, Brahmdevdada Mane, Institute of Technology, Solapur, M.S. India

Topic: Variation in Gravitational Pull: New Technique for Aquifers Mapping

Dr. More has completed his M.Sc. in Applied Electronics (Physics)in 1992 and Ph.D. in "Thin Films and Solar Cells" in 1997 from Shivaji University, Kolhapur, India. He has teaching experience of 29 yrs. at Diploma / Engineering Colleges. His interested areas of research are thin films, optoelectronics, solar cells, ground water, gravitation and bio-geo-physics. In these research areas he has published 26 research papers in national / international journals and presented 24 research papers in national / international conferences. Dr. More is Research Guide (Ph.D.) of Solapur University, Solapur in subject of Physics. He is associated with many Journals as Reviewer / Associate Editor / Editor / Executive Editor / Editorial Board Member. He has delivered Invited Talks / plenary speech / Key Note Address at various International Conferences. He worked as Convener of International Conference at BMIT, Solapur, India. He is a member of "World Association for Scientific Research and Technical Innovation (WASRTI), Life member of Indian Society for Technical Education (ISTE) AND Life Member of Institute of Scholar Scholars Dr. More was awarded "The Research Excellence Award 2020 by Institute of Scholar, Bengaluru, India.

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KEYNOTE SPEAKER

Asso. Prof. Shahryar Sorooshian
School of Business, Economics and Law, University of Gothenburg, Sweden

Topic: Science and Technology Performance

Shahryar is a University of Gothenburg Associate Professor. In industrial engineering he obtained his BSc, MSc, and Doctorate. He is a Lean 6-sigma belt holder, graduate technologist, and a certified professional in engineering management. The majority of his work in research and consultation, therefore, concerns the management of engineering, industrial engineering, and management/business engineering. He worked for many industries and universities before joining the University of Gothenburg in 2019. He has published numerous papers in renowned publications and conferences throughout his career. He has been active in overseeing many research efforts.

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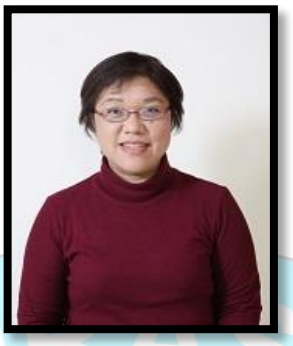
KEYNOTE SPEAKER



Dr. Yoshiko Yamaguchi
Home Care Nursing, Faculty of Nursing, Kwassui Women's University, Japan

Topic: Nurse Retention (E.G., Nurse Turnover, Nurses' Intention to Leave), Nurses' Stress (Work Stress, Family Related Stress, Stress Outcome), Employee's Work-Family Interface (Work-Family Conflict, Work-Family Enrichment)

Dr. Yoshiko Yamaguchi has received her PhD in. Kyushu University during the period of 2013-2016. Currently, she is working as research associate in Home Care Nursing, Faculty of Nursing, Kwassui Women's University, Japan. She has successfully completed her responsibilities as a reviewer of eighty-one research articles of twenty-four Journal from 2016-present. And she has been serving as an editorial board member of two Journal; LIFE: International Journal of Health and Life-Sciences and Journal of Practical and Professional Nursing and has been delegated vice president of Healthcare and Biological Sciences Research Association (HBSRA).

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KEYNOTE SPEAKER

Diena Noviarini
Ministry of Research and Technology, Ministry of Education and Cultural, Indonesia

Topic: The Empowerment of New Banten Island Made of Amounting Lava from the Underwater Mountain

Diena Noviarini is working with the Ministry of Research and Technology as part of the Ministry of Education and Cultural, Indonesia. She is a Lecturer in Public Sector Reform Program assignment which is ISO 9001:2008 and Researcher at State University of Jakarta, Indonesia since 2011. She is also a holder of series Research Intellectual Copyrights from the Ministry of Intellectual and Copyrights at a total of 9 Certificate of Copyrights. Her accomplishments are including – Graduate and Member of Young Leader Programme JICA 2010, the Indonesian Ministry of Research and Technology's Grant Year 2017, the Chair Associate of SICSSAM Korean Conference 2017 & the Keynote Speaker in ICSTR 2018 and ICSTR 2019, the Indonesian Ministry of Research and Technology's Grant Year 2018 and Indonesian Ministry of Education and Cultural in Public Society devotion Grant Year 2020.

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KEYNOTE SPEAKER

Joko Suroso

Faculty of Teacher Training and Education, National Islamic University of Kiai Haji Achmad Shiddiq Jember, East Java Indonesia

Topic: Profile of High Schools Students Science Literacy

Joko Suroso is a member of National Islamic University of Kiai Haji Achmad Shiddiq (UINKHAS) is a national college under the ministry of Religion Republic Indonesia. I currently worked at UINKHAS as the lecturer for science and physic major in faculty of teacher training and education since 2019. Thus, it is my huge responsible to establish such scientific research dealing with the value of Tri Dharma (The three principles) in the college. Since the year of 2019 until 2022 I always active to join international seminars or even to have research held by whether domestic university or abroad. In addition, there are 4 journals I have published in reputable publisher both for domestic and international level.

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KEYNOTE SPEAKER

Dr. Sheryl Grace Colaco
Professor, Dept. of Electrical & Electronics Engineering, St. Joseph Engineering College, Vamanjoor, Mangalore, India

Topic: Lighting for Horticulture

Sheryl Grace Colaco is currently working as Professor in the Dept. of Electrical & Electronics Engineering at St. Joseph Engineering College, Mangalore-India. She is actively engaged in research and has 7 international Q1 Journal publications. Gold Medal in M. Tech. General Electric (GE), USA, Scholarship -2001 for academic excellence and leadership qualities (during M. Tech.). Govt. of India, Science & Technology Grants for the PhD research project. Intellectual Ventures Invention Award-2011 (Inv. ID: 814205) for the PhD research projects she was the principal investigator for Dept. of Science Technology, Govt. of India funded project for her PhD research work in 2009. Recipient of International Society for Optics & Photonics-(SPIE), USA education outreach Grants 2020. IUCEE award for Excellence in Community Outreach Through Projects -January 2022

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PRESENTERS

(Applicants & Participants)

Asmaa Alazmi
ERCICSTR2237056

Develop a Spatial Splitting Strategy on Land Use Data for Systematic Prediction Model Validation

Asmaa Alazmi
Department of Construction Project, Ministry of Public Work in Kuwait, Kuwait

Abstract

Land use regression modeling (LUR) thorough local scale circular modeling domain has been used to characterized air pollution exposure, predict traffic-related pollutants, and define health effects for individuals within urban area. It is based in use land use variables (e.g. road type, traffic count, elevation, etc.) as input variables in regression analysis to build empirical predictive models of the pollutant concentration. Machine learning has gained substantial attention, due to the preponderance of data stemming from the information explosion. Machine learning models are designed to make as much as accurate predictions. This paper introduces new type of split data to train/test set for land use regression model validation purpose. K-mean clustering applied on the spatial land use data to split Blacksburg (VA) area to different set that share the same spatial characteristics rather than split the area by location. The finding of this paper can be used later to test the reliability and stability of the statical prediction models by test the model performance in unseen areas by eliminating locational information in the model training process.

Keywords: Machine Learning, K-Mean Clustering, Land Use Data

Introduction

Spatial data mining is a knowledge discovery process of extracting implicit interesting information, spatial relations, or other spatial pattern not explicitly stored in spatial databases. Apply a spatial data mining approach implies that the dimension of large databases become larger as spatially referenced objects also carry information concerning their representation in space by geometrical and topological properties (Koperski et al., 1996). Spatial clustering is a process of grouping a set of spatial objects into meaningful subclasses so that the members within a cluster are similar as much as possible whereas members of different clusters differ as much as possible from each other (Jiao & Liu, 2001).

The performance of LUR models can be impacted by spatial autocorrelation and non-stationarity, which will increase the model error. The random leave-one out cross-validation approach revealed different model performance outcomes using the LUR model in 36 study areas in Europe (Beelen et al., 2013). The authors indicated a drop in the magnitude of the explained variance when applying cross-validation. The model $R^2$was less than 0.1 higher than the cross-validation R^2 Indicating the existence of model overestimation. Meng et al. (2015) reported that the coefficient of determination R^2 decreased from 0.82 to 0.75 when the leave-one-out-cross-validation was applied. The majority of LUR models are designed for specific cities, limiting their application to other regions (Knibbs et al., 2014).

Machine learning algorithms for use in spatio-temporal data applications that are designed to forecast a specific concentration for unknown locations enable ambient air pollution monitoring. However, the specific validation strategy is important for assessing a given model's performance to avoid model overestimation. Validation strategies have been applied differently in spatio-temporal modeling. For example, researchers have applied both spatial validation and temporal validation to define machine learning model uncertainty of nitrogen dioxide (NO_2) prediction model (Di et al., 2020). Chen et al. (2019) applied both cross-validation and external validation to define the performance of the annual average fine particle matter and nitrogen dioxide concentration prediction models. The coefficient of

determination (R^2) was found to decrease from ~0.63 to ~0.59 for fine particle concentration, and from ~0.59 to 0.50 for nitrogen dioxide. Earlier researchers have applied machine learning toward developing prediction models that have spatial and temporal structure introduce of spatio-temporal autocorrelation (Meyer et al., 2018). Therefore, there is a need to assess prediction model uncertainty with high spatiotemporal resolution.

Methodology

Spatial clustering approaches can be divided into four general categories: partitioning method, hierarchical method, density-based method and grid- based method. The partitioning approach characterized early studies in clustering and remain one of the most cited and used approach. Many algorithms that belong to this method have been developed, all of them can be considered as derivations of three basic algorithms: K-means (McQueen, 1976), K-medoid (Mathematica, 1969) and EM–expectation maximization (Dempster et al., 1977).

Like Han et al (2009) show, the objective criterion used in the K-Mean algorithm is typically the squared error function defined as:

$$E = \sum_{j=1}^{k} \sum_{x \in C_i} |x - m_i| \quad (1)$$

where E is the sum of absolute error for all objects in the data set; x is the point representing a given object in cluster C_i and m_i is the representative object of C_i. In fact, that the K-mean algorithm is efficient in processing large data, but It presents important limitations. The major limitation of this spatial clustering algorithms is that their computational dimension become very costly with large data sets. It is also sensitive to noise and outlier data points (Han et al., 2009).

2.1. Study Area.

The mobile monitoring- bicycle- black carbon measurements was collected in a small college town (Blacksburg, VA). Two routs of 12 miles length were used for the goal of spanning a variety of environments that may impact BC concentrations.

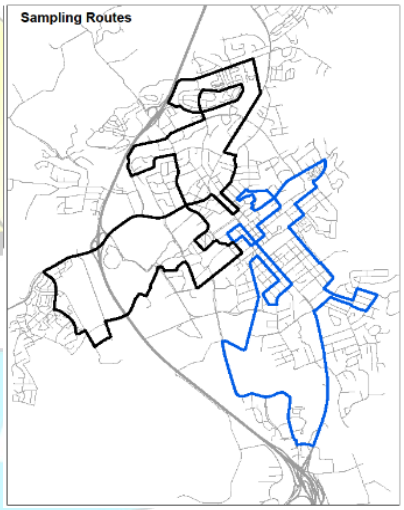

Figure 1: *Site and route distribution in Blacksburg*

Data Description.

This study uses secondary data describing data in the rural location of Blacksburg (VA) (Hankey et al., 2019). With Blacksburg (VA) being a smaller town with somewhat similar spatial features, splitting the datasets based on specific locations within Blacksburg (e.g., according to census tract id number), would not be representative to use for spatial validate the model performance. Instead, I chose to use spatial variables (land use and transportation) to segment observational data and define the resulting spatial-split

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performance. The spatial variable land use, natural environment and traffic variables were collected from publicly available sources except traffic volumes were collected using demand model. All spatial variables were tabulated at 15 buffer sizes (25 – 3,000 meters).

Modeling approach.

The spatial data were clustered using K- mean clustering algorithm in spatial variables. The data should be reduced in order to decrease the complexification of the model. Some data reduction techniques were applied to gain the most important variable for clustering. Apply some data reduction techniques can help to overcome the K-mean clustering draw back. Three approaches were used to define the most critical land use variables; recursive feature elimination, principle component analysis, and principle component analysis after removing correlated features.

The available online library was used to implement the analysis and to define the optimal number of clustering. Anaconda software was used to do the analysis and implement python script.

Result

Land use data will be used to cluster the observation spatially. 330 land use variables was reduced to be used for the K-mean cluster algorithm. The spatial variables different buffer length that used in the clustering process are:

- All road length,
- Building,
- Bus stop points,
- Employment density worker area,
- Freeway,
- Heavy vehicle,
- Household income,
- Industrial area,
- Light duty vehicle,
- Major road (arterial),
- Non building, non-residential address (business), non-tree,
- On street pike,
- Parking,
- Population density,
- Residential address,
- Retail area,
- Off street trail,
- Trees,
- Water.

Unfortunately, there is no general theoretical solution to find the optimal number of clusters for any given data set. A simple approach is to compare the results of multiple runs with different k classes and choose the best one according to a given criterion, but we need to be careful because increasing k results in smaller error function values by definition, but also an increasing risk of overfitting

Three Different approaches were used to define the best clusters. These ways were focused on dimensional reduction to define the number of clusters needed.

3.1. Recursive feature elimination.

The main issue of RFE is that it can be expensive to run. One way to reduce the

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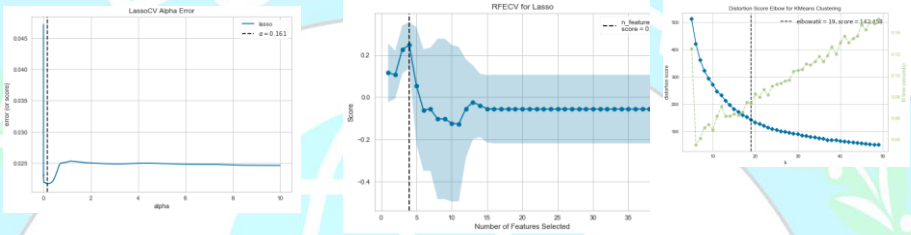
number of features removing correlated features as I don't want highly correlated features in my dataset because they provide the same information. Therefore, I removed the most correlated features from data frame using correlation matrix and remove features have the correlation coefficient above 0.8. This Step end up with the 39 variables. After that, I apply recursive feature elimination using lasso regression. I use AlphaSelection module from yellowbrick.regressor package to find best alpha from a list of choices of values between (-10, 400). This step gives me alpha value of 0.16 (figure 2a). The define alpha value were then used in recursive feature elimination CV RFECV from yellowbrick.model_selection with the defined critical spatial variables. This step ends up with four representative spatial variables (figure 2b). Finally, the four variables presented from the previous step were used as input spatial variable in the elbow K-mean clusters to get the optimal number of clusters. The final number of clusters is 19 clusters (figure 2c).

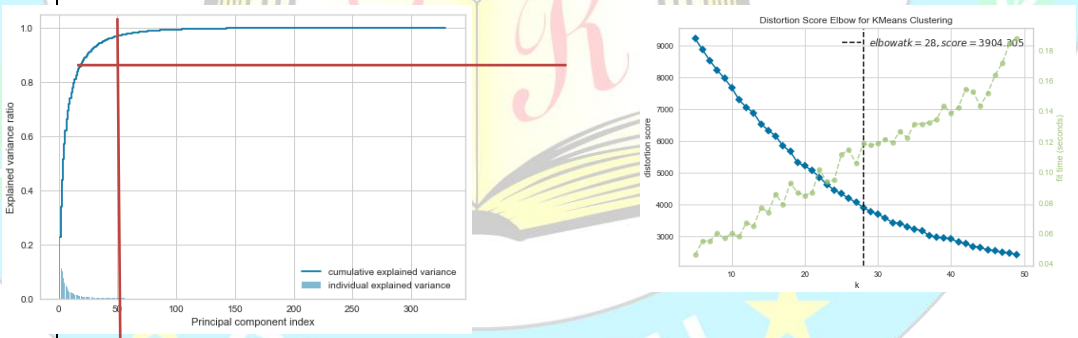


a. Lasso alpha valued provided from the yellowbrick library *b. The number of features defined by the RFE process* *c. The Number of clusters define by the RFE approach*

Figure 2: *Recursive feature elimination approach*

3.2. Principle component analysis.

The singular value decomposition used to extract spatial variables. Figure 3a shows that ninety percentage variances covered by 25 principal components (figure 3a). Theses principal component then were used as input variables in the elbow K-mean clustering algorithm. It shows that the spatial variables can be clustered to 28 spatial clusters (figure 3b).

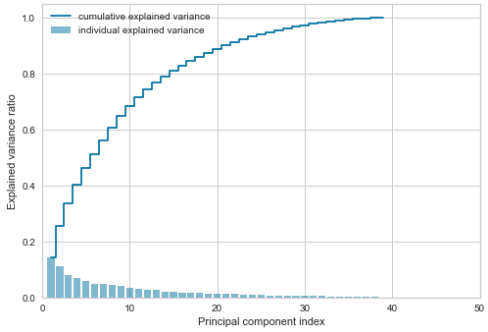


blained variance ratio covered by principal component analysis *b. The Number of clusters define by the PCA approach*

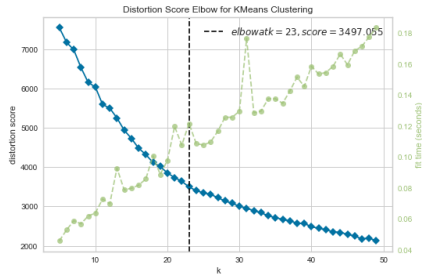
Figure 3: *Principal component analysis approach*

3.3. Principal component analysis after removing correlated features.

In this approach the correlated spatial variables were remove using the correlation matrix (like 3.1 section). The defined 39 variables were then used in apply singular value decomposition to define the number of principle component. Figure 4a shows that ninety percentage variances covered by 21 principal components. The 21 PC were then used in elbow K-mean clustering to get the optimal number of clusters. It shows that the data cluster for 23 clusters (figure 4b)



a. Explained variance ratio covered by principal component analysis



b. The Number of clusters define by the PCA approach after remo the most correlated features

Figure 4: *Principal component analysis after removing correlated features approach*

Conclusion and Future work

The first approach defined from this research will be used in the Machine learning split step in order to define the train and the test set. Many of the land-use studies have applied random validation to test the reliability and uncertainty of the model. However, it has been shown that applying another strategy—namely cross-validation—could help to overcome spatio-temporal autocorrelation (Ceci et al., 2017). Therefore, three types of spatial clustering approaches were applied to introduce new system of splitting the data spatially in small Appalachian area. The systematic cross validation approaches could help to address problems of overestimation that probably occurred in the random cross-validation model. The use of spatial and spatial-temporal cross-validation will help to eliminate the autocorrelation problems caused by autocorrelation variables.

This work could be used as part of applying machine learning algorithms in land use data to systematic split the data for more reliable and stable model. For future work it will be helpful to compare the difference of the performance between random and spatial split model. This can be helping to overcome the model overestimating.

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Seyed Maziar Hosseini Motlagh
ERCICSTR2231058

File to Factory Technology: A Flexible Process for Expanding Capabilities and Accessibility of Customized Architectural Products

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Abstract

This paper addresses the return of regionalism and customization within the realm of Architecture by investigating the reasons for the flourishment of mass-production and its impacts on the built environment. Methodology of this research is based on literature review and case study analysis, indicating how the refinement of digitally driven production process can serve the architectural values, based on a brief comparison of the processes of work in design and build companies with varied approaches in applying the digital technology. As the fundamental elements of digital production, machine and the software controlling it need to link with production strategies to unleash the digital capabilities in order to deliver both customization and economy to architectural projects by transforming the design and construction operations. The ultimate goal of this research is to demonstrate how flexible production systems are becoming available for construction sector by applying 'File to Factory' technology. The unified process of design and construction, delivering superior potential for improvement compared to older methods of prefabrication and industrialized architecture, could result in the formation of a new generation of Architects which is called 'Information master builder'. They have more control over the design and construction process; in addition, automated processes and the precision of digital tools have equipped them with a large capacity to evolve the generation, evaluation and construction of highly complicated forms. This can lead to revival of regionalism and customization of the architectural products while delivering economy. Most of these techniques were initiated by large financial investments and began their presence in

	industries as complicated and expensive methods. As a huge step forward towards the democratization of the architectural services, it is desirable for all of these potentials to transform gradually in a way to be accessible by the majority of the population. **Keywords:** File-To-Factory Technology, Mass Customization, Critical Regionalism, Digital Architecture
A. Lachehab **ERCICSTR2233052**	**Carbone Dioxyde Mineral Carbonation of Phosphogypsum Dispersed in a Potash Solution** A. Lachehab Chemical and Biochemical Sciences - Green Process Engineering (CBS - GPE), Mohammed VI Polytechnic University, El Jadida, Morocco R. Benhida Chemical and Biochemical Sciences - Green Process Engineering (CBS - GPE), Mohammed VI Polytechnic University, El Jadida, Morocco H. Hassoune Chemical and Biochemical Sciences - Green Process Engineering (CBS - GPE), Mohammed VI Polytechnic University, El Jadida, Morocco **Abstract** Carbon sequestration by reacting naturally occurring Mg and Ca containing minerals with CO2 to form carbonates has many unique advantages. Most notably is the fact that carbonates have a lower energy state than CO2, which is why mineral carbonation is thermodynamically favorable and occurs naturally (e.g., the weathering of rock over geologic time periods). Secondly, the raw materials such as calcium-based minerals are abundant. Finally, the produced carbonates are unarguably stable and thus re-release of CO2 into the atmosphere is not an issue. However, conventional carbonation pathways are slow under ambient temperatures and pressures. The significant challenge being addressed by this effort is to identify an environmentally viable carbonation route that will allow mineral sequestration to be implemented. A simple method for CO2 mineral sequestration is presented in this work, using phosphogypsum waste (important by-product resulting from the production of phosphoric acid by “wet acid method”) as a calcium source dispersed in a potash solution. After dispersion, the phosphogypsum solution resulted in the precipitation of a whitish solid phase and a supernatant liquid (potassium sulphate) as a co-product. The results showed that the maximum conversion of Ca (OH)2 (>95%) is obtained at the condition that has an optimum amount of these variables. Moreover, the results confirmed that phosphogypsum has high potential to form calcium carbonate (CaCO3) during the process of CO2 mineral carbonation. It was concluded that the mineral carbonation process using phosphogypsum can be considered to be an interesting, applicable, and low-cost method in industry to mitigate a considerable amount of CO2 from the atmosphere, which is the main issue in the current and coming years. **Keywords**: Carbone Dioxide, Carbonation, Phosphogypsum, Calcium Carbonate, Potassium Sulphate.
	Sustainable Water Infrastructure for Adapting to Coastal Climate Change Hassan Davani Civil Engineering, San Diego State University, San Diego, California **Abstract** This project seeks to advance the sustainability and resilience of coastal communities against foreseeable impacts of climate change, such as intensified precipitation, sea-level rise (SLR),

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Hassan Davani **ERCICSTR2201053**	and SLR-driven groundwater rise. The central hypothesis is that sustainable and resilient infrastructure to manage water supply and flooding in coastal areas requires informed decisions aimed at (i) enhancing sustainability by balancing the local water budget through decentralization and (ii) enhancing resilience against compound flooding in which precipitation may coincide with other inundation sources. Projections of SLR impacts increasingly will need to consider the flooding associated with the interconnections between SLR and shallow coastal aquifers, as well as expected compound flooding under typical precipitation events. Therefore, this project will establish a mechanistic framework to analyze important stressors to water infrastructure, with a focus on disadvantaged communities, and it will develop a decentralized model to enhance their sustainability and resilience. The project also aims to systematically understand the impacts of frequent and longer timescale flooding events on water infrastructure systems and explore the sustainability benefits of decentralized infrastructure to mitigate the compound inundation impacts in which precipitation coincides with other inundation sources. The project team will employ a Life Cycle Assessment (LCA) technique and couple it with distributed hydrologic modeling informed by groundwater table observations. A comprehensive LCA framework will be informed by merging approaches from hydrology and data sciences to forecast the response of water infrastructure systems to future climate change stressors. Because the success of decentralized systems heavily relies on understanding barriers that communities face in system implementation and operation, this project seeks to advance sustainability assessment of infrastructure by incorporating the needs of communities
Salah-Eddine Ouldboukhitine **ERCICSTR2201055**	**A Model for Predicting the Hygrothermal Behavior of a Hemp-Concrete Wall Using the Finite-Element Method** Salah-Eddine Ouldboukhitine IUT Clermont Auvergne, Université Clermont Auvergne, Institut Pascal, France Sofiane Amziane Université Clermont Auvergne, Institut Pascal, CNRS, SIGMA Clermont, F-63000 Clermont-Ferrand, France **Abstract** Plant-based concrete is a construction material which, in addition to having a very low environmental impact, exhibits excellent hydrothermal comfort properties. In recent decades, numerous studies have been carried out to develop models to evaluate the hydrothermal behavior of porous building envelopes. Most previous models are based on Luikov's theory, considering mass accumulation, air and total pressure gradient. This study presents a methodology for solving the classical one-dimensional hydrothermal transfer model with an implementation in MATLAB. The resolution uses a discretization of the problem according to the finite-element method. The energy and mass balances are expressed using measurable transfer quantities (temperature, water content, vapor pressure, etc.) and coefficients expressly related to the macroscopic properties of the plant-based concrete (thermal conductivity, specific heat, water vapor permeability, etc.), determined experimentally. The methodology is validated on a test case and the results show that the methodology is robust in handling a rationalization of the model whose parameters are not ranked and not studied by their degree of importance.

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ERCICRLSH2201068

Three-Dimensional Reconstructions of Canal Network Reveal Coral Growth patterns

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Abstract

Coral reefs are the cornerstone of marine ecosystems. Researchers have performed comprehensive studies on reef-building corals including their genomics, polyp metabolism, disease resistance, and adaptation to environmental change. However, the forming regulations of the canal network in coral colonies are still not understood adequately. The non-transparent skeleton influences direct observation of the distribution, parameters, and relationships among canals in coral colonies. Experiments with traditional biological methods have provided very limited structural information of coral skeletons and internal canals. To solve this problem, high-resolution computed tomography (HRCT), which can be used to non-destructively capture the morphology and internal structure of coral colonies, has gained our attention. In this study, we reconstructed 11 coral species using HRCT to investigate coral growth patterns and parameters. Our reconstructions of canal network revealed the characteristics of different coral species, and we further visualized the growth axes and growth rings to understand the coral growth directions. Our reconstructions can visualize the coral growth processes during different physiological states, which reveals the mechanism of calcium transport in coral colonies. In addition, we calculated the coral skeleton void ratios to ascertain the skeletal diversity, devising a method to quantify coral growth. On the basis of the three-dimensional (3D) reconstructions and growth parameters, we investigated the growth strategies of different coral species. This research increases the breadth of knowledge on how reef-building corals grow their colonies, providing information on reef-forming regulations. The data obtained through HRCT and 3D reconstruction contain a large amount of coral growth information, which can be used in further research on reef-forming patterns under different conditions. The method used in this study can also be applied to animals with porous skeletons.

Keywords: High-Resolution Computed Tomography, Canal Network, Structural Information, Reef-Building Coral, Growth Pattern

Joanna Zelazny
ERCICRLSH2201073

Kinesiotherapy Online Form of Rehabilitation Due to the Pandemic

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Abstract

What to do when the threats of Covid-19 reduce our physical activity? many people stayed at home for long periods. However, their need for exercise is still the same. Many people in need of rehabilitation abandoned them because of fear of the virus. One of the ways to activate people who require rehabilitation without leaving home was the implementation of new technologies. Kinesiotherapy is a well-known field in physiotherapy. However, just a few

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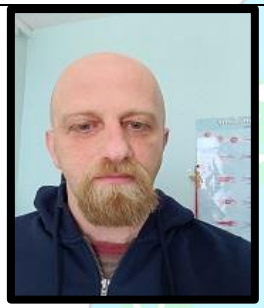
years ago, few people would have thought about conducting this kind of rehabilitation in on-line form. In Poland and probably in other countries around the world, challenges have been taken up. The most difficult thing was to reach the people most in need of this form of rehabilitation - the elderly persons. At the beginning, many of them were afraid of this form of exercises. However, the need for movement and contact with the therapist were stronger than the fears. Many people from the gym exercises switched to virtual reality. Less than 2 years ago the pandemic was announced. Nowadays it can be seen how the online kinesiotherapy exercises affected people who took advantage of this opportunity. In Poland, many classes are now held stationary. The vast majority of people, however, like online classes. For many people it is the dominant form of rehabilitation activity, for others it is only a supplement. Cameras and the Internet will never replace a personal meeting with a therapist, but the pandemic has opened up new possibilities in rehabilitation. This task brought with it many opportunities and threats, it brought advantages and disadvantages, which will be discussed during the presentation



Giorgi Zaalishvili1
ERCICRLSH2201075

Zebrafish as a Model for Genotoxic Anticancer Drug Research

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Abstract

Poly (ADP-ribose) polymerase-1 (PARP-1), as well as topoisomerases (Top) nowadays serve as a target for cancer therapy and have been extensively studied in mammalian model systems, however in other vertebrate models remain less characterized. Zebrafish is emerging as an alternative vertebrate model for recapitulation of numerous human diseases including cancer due to its cost effectiveness, high fecundity, transparency of embryos and homology of major organs and cell types to that of mammals. Our studies have shown that Top 2 poisons (doxorubicin and etoposide) do not cause death in 1-day post fertilization (dpf) embryos, however they induce DNA damage as observed by alkaline comet assay. After the detailed examination of this phenomenon, it was shown by fluorescence microscopy that DOX uptake depends on the stage of embryonic development and differs in in vivo and ex vivo systems. We have also revealed some similarities of response towards genotoxic stress induced by Top 1 poisons (rubitecan and irinotecan) and PARP-1 inhibitor olaparib between mammalian and zebrafish systems. It was shown that Top 1 poisons increase mortality of 1 dpf zebrafish embryos and induce DNA damage. It was also demonstrated that PARP-1 inhibitor – olaparib, significantly increased the mortality of rubitecan treated embryos as well DNA damage level. Interestingly, chemical inhibition of tyrosyl-DNA phosphodiesterase -1 (TDP1), the main player in Top 1 cleavage complex repair in mammalian system, did not show any effect on embryo mortality and DNA damage level. On the next step we evaluated the effect of Top 1 poisoning and PARP inhibition on caspase-dependent apoptosis in zebrafish embryos. We have shown PARP-1 apoptotic fragmentation in 5-hour rubitecan treated zebrafish embryos by Western Blotting. For in situ detection of apoptotic cells, whole mount immunofluorescence using anti-activated caspase-3 Abs has been performed. Caspase-3 positive cells were observed predominantly in the brain, eye and notochord area. The amount of caspase-3 positive cells was significantly reduced in rubitecan treated embryos in the presence of olaparib. Collectively, our data introduces zebrafish as a valuable model for anticancer drug research.

Keywords: Zebrafish, Embryo, Topoisomerase, PARP-1, Apoptosis

Bhanupriya Periaswamy
ERCICSTR2202053

A Novel Deep Learning Model Based Vehicle Data Offloading and Optimal Resource Allocation for Vehicular Networks with Blockchain Technology

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Abstract

As people are accustomed to getting information in vehicles, mobile data offloading through Vehicular Networks becomes prevalent nowadays. However, the impacts caused by vehicle mobility (such as the relative speed and direction between vehicles) have great effects on mobile data offloading. In this paper, a novel deep learning algorithm namely Improved Deep Neural Network (IDNN) is proposed for vehicle data offloading and an optimal algorithm namely Quasi Opposition based Chicken Swarm Optimization (QOCSO) is proposed for efficient vehicle resource allocation. Initially, the vehicles in the vehicular networks are clustered with the help of the Cosine Similarity-based K-means Algorithm (CSKMA) for transmitting the data in an energy-aware manner. Then Cluster Heads (CHs) are optimally selected for the generated clusters using Boltzmann Selection Probability-based Earth Warm Algorithm (BSPEWA). The selected CHs are responsible for collecting the data from the cluster members and that is forwarded to the RSU. Then the suitable Mobile Edge Servers are selected according to the IDNN algorithm that offloads the data from the CHs to the appropriate server. These received tasks of the vehicles are stored as a blockchain for providing security to the vehicular network and finally, the resource allocation of the incoming tasks to the vehicles is performed using the QOCSO algorithm. Experimental results show that both offloading and resource scheduling schemes work better than the other state-of-the-art algorithms for vehicular networks.

Keywords: Vehicular Networks, Block Chain, Vehicle Clustering, Cluster Head Selection, Data Offloading, Resource Allocation, Vehicular Security

Darshan Mahajan
ERCICSTR2202055

Dynamic Group Allocation Framework for IRCTC

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Abstract

The Indian Railway Catering and Tourism Corporation (IRCTC) is one of the most popular and largest organizations in India and contributing in the development of the country substantially. Millions of passengers are traveling per day through Indian railways and avail the facilities and services provided by IRCTC. The IRCTC has well developed mechanism to provide services usng web technologies and is in process of enhancing the technological development to provide efficient and effective service in future. However, some common problems in relation with pantry services may be resolved by applying simple technical changes. The common problems faced by the passenger are taken under consideration particularly in relation with pantry service during long journey. After studying real time problems faced by passenger during journey such as ordering food, order modification, order cancellation etc. The technical collaborative model framework has been suggested. This frame work is unique concept and will help in reducing passenger problems through dynamic grouping.

Keywords: Technical Framework, Dynamic Grouping, Pantry Services, Passenger

Bienvenu Gael Mbanga
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Synthesis and Characterization of Carbon Dots Coated Al2O3 Nanofibers Nanocomposite for Pb2+ ion Adsorption and Reuse for Latent Fingerprint Detection

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Abstract

This study reports a new approach of preparation of carbon dots coated aluminum oxide nanofibers (CDs/Al2O3NFs) nanocomposite and reusing the spent adsorbent of Pb2+-CDs/Al2O3NFs nanocomposite for latent fingerprint detection (LFP) after removing Pb2+ ions from aqueous solution. CDs/Al2O3NFs nanocomposite was prepared by using CDs and Al2O3NFs with adsorption processes. The prepared nanocomposite was then characterized by using UV-visible spectroscopy (UV-visible), Fourier transforms infrared spectroscopy (FTIR), Fluorescence, X-ray diffraction pattern (XRD), scanning electron microscope (SEM), Transmission electron microscopy (TEM), Energy-dispersive X-ray spectroscopy (EDS), Zeta potential, X-ray photoelectron spectroscopy (XPS). The size of the CDs average was 51.18 nm. The synthesized CDs/Al2O3NFs nanocomposite has proven to be a good adsorbent in Pb2+ removal from water with optimum pH 6, dosage 0. 2 g / L. The results were suited by Freundlich models rather than the Langmuir, which was indicated the linear fit of Freundlich models with (R2 = 0.9896). This adsorption was related to the multilayer adsorption processes of Pb2+ ions on the CDs/Al2O3NFs nanocomposite surface. The adsorption capacity of CDs/Al2O3NFs nanocomposite showed the best removal of Pb2+ ions with qm = (177. 83 mg/g), when compared to the previous reports. This adsorption followed the pspseudo-second-orderinetics and intra particle diffusion processes. ΔG and ΔH values indicated spontaneity and the endothermic nature of the adsorption process. CDs/Al2O3NFs nanocomposite, therefore, showed potential as an effective adsorbent. Furthermore, the metal loaded on the adsorbent Pb2+-CDs/Al2O3NFs has proven to be sensitive and selective for LFP detection on various porous substrates. Hence Pb2+-CDs/Al2O3NFs nanocomposite can be reused as a good fingerprint labeling agent in LFP detection so as to avoid secondary environmental pollution by disposal of the spent adsorbent.

Keywords: CDs/Al2O3NFs Nanocomposite, Lead Adsorption, Isotherm, Kinetics, Thermodynamics, Reusable for Latent Fingerprint Detection

Diamond Uchenna Osemene
ERCICSTR2235053

Traditional Methods of Conflict Management and Resolutions: The Case of Old Oyo Empire

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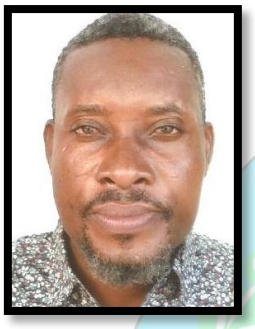
Abstract

This study examined the mechanism for conflict resolution in traditional African societies with particular reference to Old Oyo Empire in Yoruba speaking societies of the western part of Nigeria. The paper notes that conflict resolution in Old Oyo Empire provides opportunity to interact with the parties concerned, it promotes consensus-building, social bridge reconstructions and enactment of order in the society. The paper submits further that the western world placed superiority on the judicial system presided over by council of elders,

kings' courts, people , and for dispute settlement and justice dispensation, posit that traditional conflict resolution techniques such as mediation, adjudication, reconciliation, and negotiation as well as cross examination which were employed by the Old Oyo Empire in the past, offer great prospects for peaceful co-existence and harmonious relationships in post-conflict periods than the modern method of litigation settlements in law courts. Therefore, recommend reverting back to the traditional method of conflict management and resolution because it is cheaper and friendlier.

Keywords: Old Oyo Empire, Mediation, Reconciliation, Adjudication, Negotiation, Adjudication, Negotiation



Olalekan Ezekiel Ajayi
ERCICSTR2235055

Change Management

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Abstract

Every organization that is engaged in technological as well as non-technological innovation will transform itself into an organization. At the extreme ends of the innovation process – generation and implementation of ideas – organizations and their managers need to develop an effective and effective Change Management Strategy to be effective and effective in managing that change. Professionals and stakeholders are frequently asked to develop attitudes and personal skills for change implementation, as well as a technical understanding of how to use change management as tools. This article will discuss the challenges that Organizations and owners of businesses face when implementing change. Well-known theories and literature will also be discussed to shed light on the importance of change management in organizations. Many organizations face a need for change in their daily operations, but their outlook for change differs. The main purpose of this research is to critically evaluate the effect on corporate goals and objectives from the organizational viewpoint of view of change and change management. It focuses on a factor that can cause internal or external changes, which determines the kind of change and the performance of organizations in different countries. It also sheds light on the concepts and applications of change management and different models of change. From 2019 to date all the countries of the world experience a great change to the hand of pandemic that leads to depression and economic meltdown but many still find a way to get out of this and when many designs strategies to be out of this, this is a simple analogy of change both in the private and public sector of the world.

Keywords: Corporate Goals, Change Management, Organizational Change, Organizational Performance

Adeola Eunice Adeyemi
ERCICSTR2235061

Impact of The Strategic Management Planning on The Organizational Performance

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Abstract

Regardless of the relevance and applicability of strategic planning practice to business organisation, the literature indicates very few studies have attempted to investigate the effect of strategic planning practice on the performance of enterprises mainly the relationship between strategic planning practice and performance of entrepreneurs. The literature suggests that there is not only limited information on the strategic planning practice of Enterprises but also little research in this important area of study. By using

structural questionnaires, the data for the study were collected from 52 Enterprises. The findings of the study indicate a significant positive relationship between strategic planning practice and performance of Enterprises. The result of the study seems to demonstrate that the practice of strategic planning in Enterprises will not only be to improve their financial performance but also to increase its non-performance as well.

Keywords: Strategic planning, Enterprises, Performance.

Abiodun Gbenga Giwa
ERCICSTR2235062

Development of A Mathematical Model to Study the Impact of State of Change Dependent Exchange Current Density on The Generated Voltage Hysteresis of Silicon Anode-Based Lithium Half Cells

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Abstract

In this work, three different types of Silicon (porous, nano and bulk) anode-based coin cells are manufactured and lithiation-delithiation battery cycling tests are conducted. During the experiment, a capacity difference is witnessed at the beginning and the endpoint of the battery cycling loop. This capacity difference during battery cycling is reduced by implementing a side-reaction correction technique on the exchange current density using the Tafel kinetics formula. A huge voltage gap known as voltage hysteresis is generated during the battery cycling experiment of all three types of cells. Here, a physics-based mathematical model is developed to identify the main reason behind this voltage hysteresis generation. The impact of hydrostatic stress is checked on this generated voltage hysteresis. The stress-induced voltage values are found significantly low to have an impact on voltage hysteresis. Next, key parameters are identified which can control this stress. Then, new sets of exchange current density equations (average, linear and logarithmic) as a function of State of Charge (SOC) are developed. It is observed that, with the application of logarithmic SOC dependent exchange current density equation, the voltage curve is fitted the best with the experimental result and the generated hysteresis can be minimized by controlling this SOC based exchange current density equation. Details of this study will provide more explanation.

Keywords: Hysteresis, State of Charge, Tafel, Model, Battery, Parameters

Habeeb Oladimeji Adejumo
ERCICSTR2235063

S-Transform with a Compact Support Kernel and Classification Model Based Power Quality Recognition

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Abstract

In this paper, a novel method for power quality (PQ) events recognition is presented. Nine types of PQ events consisting of single and multi-stage disturbances are considered for the study. For this task, features observed in the time-frequency (t, f) plane have been used. Synthetic PQ events are generated using mathematical models. These signals are then projected in the time-frequency plane via the ST with a Compact Support Kernel (ST-CSK) providing the time-frequency resolution, energy concentration and robustness to noise. In this plane, PQ events are localized and characterized. The extracted features are then classified using several technics. The achieved results show than overall accuracy of 100%

has been obtained with Support Vector Machines and Random Forest classifiers even with signals embedded in high Additive White Gaussian Noise level (SNR=5dBSNR=5dB). In the same conditions, XGboost classifier accurately detects 99.72% of PQ events.

Olanrewaju Suleiman Ajibade
ERCICSTR2235064

The Demand for External Audit Quality: The Contribution of Agency Theory in the Contex of Nigeria

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Abstract
Financial statement audits are mandated in most countries, thus making it difficult to distinguish between auditing driven by private incentives versus that driven by regulation. Who would ask for an audit, and how would its quality be assessed in the absence of regulation? Many private companies in Nigeria get their financial statements audited even though the law does not require it. In this field study, we conduct interviews to discover reasons for demanding an audit, and criteria used to assess their quality. Our study reveals that both internal stakeholders (management, boards, and employees) as well as external stakeholders (customers, banks, and private equity firms) request audits. Users evaluate audit quality based on a variety of criteria such as the auditor's accounting expertise, the absence of errors, the fees involved, risk assessments offered, allocation of effort, internal control, and general business advice. Implications for audit regulations are discussed.
Keywords: Audit Quality, Regulation of Audits, Sources of Demand for Audits of Private Firms, Field Study

Priyanka Yadav
ERCICSTR2235069

Global Medical Tourism-A Review

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Abstract
Medical tourism is related to the travel of patients from one country to another in order to obtain medical treatment in that country. There are several countries worldwide promoting medical tours and attracting patients. Most of the developing countries attract patients because of cost benefits whereas the developed nations attract patients who require complex surgeries for any kind of additional medical treatment. The main aim of this research paper is to focus on the development of the medical tourism industry worldwide. Medical tourism may impact both the country to which a person travels for treatment (the exporter of medical tourism services) and source country (who import medical tourism services). Issues of patient's safety, the global movement of health professionals, the emergence of a two-tier system and financing of domestic health system are all discussed. Medical tourism industry throughout the world at a fast rate. It has a huge potential for generating employment and earning large amount of foreign exchange. This will help the country's overall economic development. Medical tourism incorporates multi-dimensional activity but basically it is a service industry. Hence, it can be said that it is a win situation for both the patients as well as the destination countries.

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Keywords: Economic, Importance, Uses, Economics Benefits and Medical Tourism

Basheer Mansoor
ERCICSTR2235070

Nanoparticle Deposition Pattern During Colloidal Droplet Evaporation as In-Situ Investigated by Low-Field NMR: The Critical Role of Bound Water

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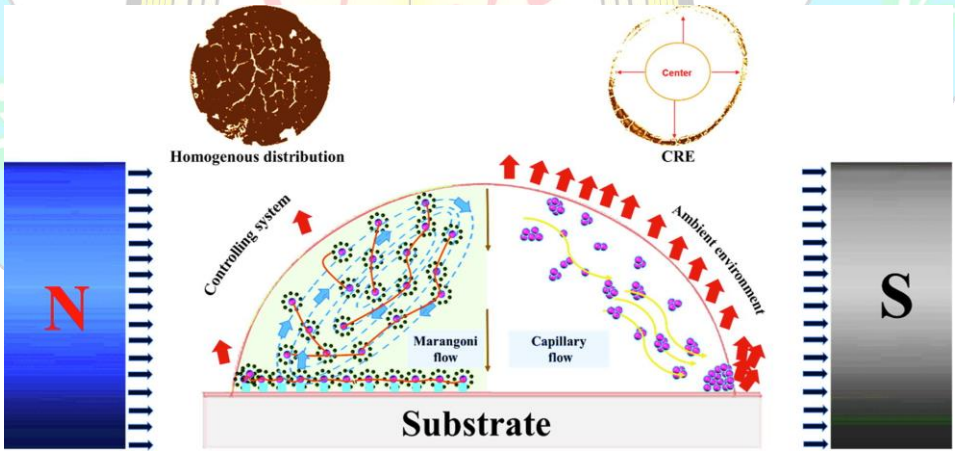
Abstract

The evaporation of a colloidal droplet on a solid surface produces a ring-like structure at the pinned contact line due to induced capillary flow, also known as the coffee-ring effect (CRE). However, the addition of certain additives can significantly reduce CRE, whose physical origin remains in debate. In this study, the time-resolved low field (LF)-NMR technique highlights the effect of different water fractions in colloidal droplets on the ultimate distribution of silica nanoparticles during evaporation. With the assistance of 1H T2 relaxometry, the impact of decreasing evaporation rate (J) and additives on the fractions of bound, trapped, and free water can be obtained. Utilizing the T2 Carr-Purcell-Meiboom-Gill (CPMG) sequence approach, in-situ tracking during droplets evaporation, with varying J, was obtained to conclude the minimum existence time of bound water required during evaporation for CRE suppression. As the droplet J decreases, the competition between the time scale of totally droplet evaporation tF and the time spent of bound water during evaporation tB may influence the ring formation. Experimentally a shorter duration of tB/tF ≤ 0.5 is required for formatting the coffee ring structure and successfully suppressed when its existence time surpasses a particular threshold ≥ 0.5.



Tamiru Mengst Habtu
ERCICSTR2235071

Sustainability in Building Construction Projects: Using Lean Management Principles to Identify and Reduce Process and Material Related Waste in Addis Ababa

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Abstract

The Ethiopian construction industry is a pillar of the Ethiopian economy, contributing more than half (70.9 %) to the industrial sector and expanded roughly by 20.7 per cent signifying the leading role the construction sector plays in terms of roads, railways, dams and residential houses expansion. For years the cost of construction in Ethiopia has increased faster than inflation making it more and more expensive to build. The earlier researcher has pointed to the potential of lean philosophy and its methods in construction tools to make it more efficient and overcome the uncertainty and complexity that categorize the construction industry. Certain tools and methods have been conceptualized in the field of lean construction, which lacks research based on quantitative data. It is therefore this B.Sc. thesis purpose to develop a tool in how to identify and measure waste, guide in how to prioritize significant waste reduction activities and estimation of their impact on building construction projects. Through observations, the authors gained insight into activities and processes in building construction projects and what parts of these were wasted. It was shown that 29.48% of workers' time at the project site is spent on value-adding activity that needs to be optimized while 50.83% of the time is the non-value-add activity that needs to be eliminated. There is also a Non-value add but required (necessary waste) accounting for 19.69%, which need to be optimized. The study also revealed that the most significant expected waste is waiting (34.98%), followed by motion (16.75%); transportation with 11.33 %; over-processing with 10.84%; inventory with 10.34%; overproduction with 9.8%, individual's skill 4.43% and making defective product 1.48 %. Finally, non-value-adding time of labour 15.25 % of the project cost being wasted, scrap waste 12.62% as a percentage of material cost being wasted, and cost of excess inventory result in waste of 1.3% of material cost. Knowledge of construction activities, processes, and waste together with lean theory gave way to a tool that can be used within the construction industry was aimed for. the tool is a first step to understanding waste in a construction project or company together with an approach to prioritize where waste reduction activities are most crucial.

Keywords: Process, Material, Waste, Lean Construction, Lean Management

Seema Vinayak
ERCICSTR2236057

Role of Cognitive-Social Moderators, Quality of Life and fear of COVID-19 in Essential Service Providers (ESPs)

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Abstract

Frontline essential service providers may experience stress during pandemics. Covid-19 created unprecedented situation where online communication via social networking virtually cut off the traditional communication modes. Such disruptions can have a long-term impact on the psychological health of the otherwise healthy individuals. The investigation focused on studying social–cognitive moderators in relationship of quality of life and fear of Covid-19. Besides, attempt was made to study whether age and gender affect these cognitive –

social variables. One hundred and six frontline Indian police officers of Covid-19 Task Force in three cities of Chandigarh, Panchkula, and Mohali (in age range 30-35 years and 35 -40 years) were administered scales of online social support, stress, hope, quality of life and the fear of covid-19. Descriptive statistics, correlation and, predictor analysis revealed no significant gender or age differences on hope, fear of Covid-19, online social support. High social support and hope reduced the fear of Covid-19. The importance of exploring Yoga intervention in dealing with Covid 19 has been emphasized.

Keywords: Essential Service Providers, Fear of Covid-19, Hope, Online Social Support

Olalekan Ezekiel Ajayi
ERCICSTR2236051

Impact of Innovation on the Performance of SMEs

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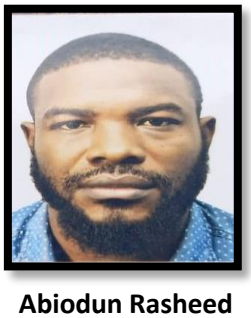
Abstract

Intense competition under the global economic system forces small and medium-scale Firms, among others to rethink their competitive place vis-à-vis their rivals through innovation. That is why, over the last two decades, innovation has been the focal point of small business literature, studies, and government policy. Little attention to this, however, the possible effect on firm efficiency of the various dimensions of innovation has been established. Enriching the literature, this paper assesses the effect of various innovation dimensions on the performance of small and medium-scale enterprises. A total of 284 samples were collected from small and medium-scale such as food and beverage, textiles and garments, and wood-based sub-industries throughout Nigeria. The data were analyzed using regression analysis. The results reinforced the assumption that product innovation and process innovation had a substantial effect on firm efficiency, where the former had a greater impact than the latter. In addition to consolidating the existing theory on the importance of innovation to explain the variation in firm performance, the findings also inform small and medium-scale enterprises and policymakers that innovation is a critical factor in today's entrepreneurial activities. This paper explains the impact of innovation on the Performance of small and medium-scale enterprises (SMEs) in the four Ilorin metropolitan clusters. The results reinforced the assumption that technological innovation had an effect on firm efficiency rather than non-technological innovation, and further studies could look at how small and medium-scale Firms measure the solvency ratios of innovation before opting for internal or external sources of innovation before real innovation takes place.

Keywords: Technological Innovation, Non–Technological Innovation, Solvency Ratios, SMEs Performance



Abiodun Rasheed Yakub
ERCICSTR2236052

BCG: Growth Sharing Matrix

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Abstract

Enterprises must employ established frameworks for resource allocation to several main business units in today's dynamic, rapidly changing, and fiercely competitive global market. An organization's portfolio matrix model, developed by Boston Consulting Group (BCG), is used in this article. The Boston Consulting Group (BCG) is a management consulting firm that specializes in helping corporations optimize their processes. For better marketing decision-

	making, the BCG Matrix is a great tool for analyzing product performance at the industry and company levels. Evaluations are carried out to identify whether significant business units are to be invested in, sold, or closed. To effectively manage a company's available resources, it helps the company implement successful business management. Known and useful, it is one of the most well-known consulting firms in the world today. The BCG matrix is used in this study to provide business organizations with assistance on how to pick the best business policies.
Ademola Ibrahim Olaniyi ERCICSTR2236053	**Literature in English Studies: A Theory of How Teachers and Students in Nigeria Secondary Schools Deal with the Subject** Ademola Ibrahim Olaniyi Department of English Language, Faculty of Humanities and Social Sciences, Ajayi Crowther University, Oyo, Nigeria **Abstract** Recent research on Literature education in Nigeria has highlighted the state of ambivalence of the Literature curriculum (Choo, 2004); suggested possibilities for its reconceptualization, taking into consideration the environment and impact of globalization (Holden, 2000; Choo, 2011); and considered the offering of alternative curricula (Poon, 2007). An exploration into the state of Literature as a subject in Nigeria secondary schools in relation to this recent research was carried out, by considering the role of Literature in the current political, economic, social and educational climate. This paper presents the findings and analysis of students' perspectives, obtained through in-depth interpretivist case studies conducted at five sites, purposively selected to incorporate the range of school types in Nigeria. Data collection methods included focus group interviews, written protocol and document analysis. Emergent themes included: the insignificant impact of local literature on the study of Literature, the low status and the lack of desirability of Literature as a course of study, which led to the formulation of four key propositions supporting development of theory on ways in which students deal with Literature in English studies in Nigeria secondary schools. The findings drawn from original empirical data from students have implications for theory, policy and practice.
Basirat Taiwo Shonde ERCICSTR2236054	**Traditional Methods of Conflict Management and Resolutions: The Case of Old Oyo Empire** Basirat Taiwo Shonde History and Diplomatic Studies, Faculty of Humanities and Social Sciences, Ajayi Crowther University, Oyo, Nigeria **Abstract** This study examined the mechanism for conflict resolution in traditional African societies with particular reference to Old Oyo Empire in Yoruba speaking societies of the western part of Nigeria. The paper notes that conflict resolution in Old Oyo Empire provides opportunity to interact with the parties concerned, it promotes consensus-building, social bridge reconstructions and enactment of order in the society. The paper submits further that the western world placed superiority on the judicial system presided over by council of elders, kings' courts, people , and for dispute settlement and justice dispensation, posit that traditional conflict resolution techniques such as mediation, adjudication, reconciliation, and negotiation as well as cross examination which were employed by the Old Oyo Empire in the past, offer great prospects for peaceful co-existence and harmonious relationships in post-conflict periods than the modern method of litigation settlements in law courts.

	Therefore, recommend reverting back to the traditional method of conflict management and resolution because it is cheaper and friendlier. **Keywords**: Old Oyo Empire, Mediation, Reconciliation, Adjudication, Negotiation, Adjudication, Negotiation
Myriam Abboud **ERCICSTR2236054**	**Effect of Ketogenic Diet on Quality of Life in Adults with Chronic Disease: A Systematic Review of Randomized Controlled Trials** Myriam Abboud College of health Science, Zayed University, United Arab Emirates F. Al Anouti Department of Health, College of Natural and Health Sciences, Zayed University, Abu Dhabi, United Arab Emirates E. Georgaki Queen Mary University of London, Barts and The London School of Medicine and Dentistry, London, United Kingdom D. Papandreou Department of Health, College of Natural and Health Sciences, Zayed University, Abu Dhabi, United Arab Emirates **Abstract** Background: Chronic diseases adversely affect Quality of Life (QOL). The Ketogenic Diet (KD) may improve the QOL. Objective: The aim of this systematic review is to summarize the available evidence of randomized controlled trials (RCTs) to establish the effect of KD on the QOL in adults with chronic diseases. Methods: Reporting followed PRISMA guidelines. We included randomized controlled trials (RCTs) conducted on adults with chronic disease; including an intervention group that received KD and a control group, and where QOL was reported as outcome. We searched PubMed, APA PsycInfo, EMBASE, the Cumulative Index to Nursing and Allied Health Literature (CINAHL), the Cochrane Library, and Clinicaltrials.gov, and the references of the included articles and previous relevant reviews, without language or time restrictions. We critically appraised included studies and narratively synthesized their findings. Results: 9 RCTs were included. The risk of bias was low, except for allocation concealment and blinding. In patients with cancer: one RCT found an improvement in overall QOL, another reported improved physical component summary, and one found no superiority of KD in all QOL domains. In patients with neurological disorders: improved QOL was reported in Alzheimer's disease patients, whereas no difference in mental and physical health QOL was noted in patients with multiple sclerosis. In patients with obesity and Type II diabetes: one RCT reported superiority of energy-restricted KD in improving role functioning, mental health, health perceptions, and pain compared with guideline-based diet, whereas in another RCT high and low carbohydrates diets achieved comparable improvements. Among patients with knee osteoarthritis, no differences between KD and low-fat groups were noted. Dietary compliance with the KD, reported in three studies, showed to be high. Side effects were mostly noted during the first weeks of intervention, and adverse events were not markedly different with KD and comparator diet. Conclusion: The evidence from RCTs

investigating the effect of KD on QOL in adults with chronic disease is inconclusive. The promising effect noted in some included studies, and the low rates of adverse events and side effects encourage future investigations in this regard.

Keywords: Diet, Ketogenic, Quality of Life, Chronic Disease, Systematic Review, Meta-Analysis

Mehriban Imanova
ERCICSTR2203071

New Model of Technological Progress: Science and Education

Mehriban Imanova
Yusif Safarov 27, Science Development Foundation, President of the Republic of Azerbaijan, Azerbaijan

Abstract

The system of science and technology has undergone significant changes in recent years. The organizational structure of science is changing, albeit very slowly: the size of old scientific organizations has noticeably decreased, which has increased the flexibility and quality of management. New sectors appeared - non-state science and small innovative business. The provision of instruments and equipment has not improved, but the differentiation between the strong and the weak has increased. Science has aged significantly, but in the last year or two, the interest of young people in the natural sciences and technical universities has somewhat increased. Science and education converge very slowly. The solution of this problem could give a qualitatively new impetus to the process of the revival of domestic fundamental science.

Peter Kaba
ERCICSTR2203058

Multivariate Analysis of Heavy Metals and Human Health Risk Implications associated with Fish Consumption from The Yangtze River in Zhenjiang City, China

Peter Kaba
International House, United Graduate School of Agricultural Sciences, Ehime University, Japan

Abstract

Heavy metal contamination in aquatic environments has been a hot topic in the past decades. Herein, using fish species as bioindicators. The levels of toxic and essential metals in the YangtzeRiver were analyzed by multivariate analysis. Muscles of 60 fish samples which comprised of six different fish species: hypophthalmichthys molitrix, ctenopharyngodon idellus, blicca bjoerkna, mylopharyngodon piceus, carassius carassius, and pelteobagrus fulvidraco; were analyzed for total lead (pb), cadmium (cd), zinc (zn), aluminum (al) cobalt (co), magnesium (mg), chromium (cr), and copper (cu). The health risk indices (carcinogenic and non-carcinogenic) associated with consumers' health were estimated for both child and adult. Finding of the study revealed that of the analyzed metals, zn recorded the highest mean concentration of 9.87 µg/g in carassius carassius followed by mn (7.97 µg/g) in pelteobagrus fulvidraco, cu (2.07 µg/g) in mylopharyngodon pieces, pb (1.04 µg/g) in hypophthalmichthys molitrix, cr (0.63 µg/g) in hypophthalmichthys molitrix, cd (0.19 µg/g) in blicca bjoerkna and ni (0.16 µg/g) in pelteobagrus fulvidraco all measured in wet weight (w/w). In addition, the health risk assessments revealed that children are at heightened non-carcinogenic risk for pb, cd, and co upon consuming the examined fish species. Moreover, target cancer risk showed that the examined fish species are safe for inhabitant's consumption and may not pose cancer effects to both children and adults. Furthermore, the

	principal component analysis revealed that the pollution of metals in yangtze river originates mainly from anthropogenic activities and could deteriorate the quality of fish in yangtze river. This therefore in forms proper monitoring and regulation to protect the resources of the yangtze river.
 Shafiq Ur Rehman **ERCICSTR2203061**	**The Shafiq Ur Rehman Son of Abdul Hakeem Conqueror, Owner, Winner, Design, Weather and Researcher of World the Hybrid Transformation System of Hybrid Aircraft Space Craft Submarine, Helicopter, Hovercraft and Ship System** Shafiq Ur Rehman Hybrid Design, Hybrid World of Science and Technology, Karachi, Pakistan **Abstract** In this innovation and research work, i introduce the hybrid transformation system for saving life from the natural and artificial system with respect to physical and biological science system for human being, animal and artificial.in this research work hybrid design analysis of submarine transform into ship or straight board this is first stage of hybrid transformation system, similarly second stage transform into ship, the ship transform into helicopter, the fourth stage helicopter transform into space craft, the fifth stage aircraft convert into space craft and sixth stage the space craft and aircraft transform into hybrid hovercraft for the space science. The main purpose of research is to develop the quantitative and qualitative model for the hybrid transform system for the world of science and technology. These more than six stage transform more than twenty sub stages of hybrid science with respect to physical and biological science according to hybrid physical and biological science. The background of this research nothing before develop in in this research and development. I am the one in billions who develop the methodology of saving life from natural and artificial disaster. The main goal of this research modification of law of conservation of energy that energy can be create nor destroy from one forms to another form of energy. The energy never losses but it can also recovery of energy with respect to matter, solid. liquid, gas, plasma, blackhole and hybrid energy. It is the only one model for the science and technology that define direction of saving every living and nonliving. Please do not discuss the religious matter because the political matter. The most important of our research is to develop the system for the economic system which reduce the poverty of the poor people of the realm era. The methodology is twenty two discipline of engineering and similarly for non-engineering world. The most important design of beyond the vision and out of the world of science and technology. This design has no loss only profit. **Keyword:** Hybrid Aircraft, Space Craft, Hybrid Hovert, Submarine, Helicopter.
Amal Suleibe **ERCICSTR2203076**	**Managing with Intelligent Dashboards A case study of EMR using Open-Source Tools** Amal Suleibe Faculty IT, Hebron University, Hebron, Palestine **Abstract** In the age of evolution that is based on knowledge and information that is changing dramatically in a blink of an eye, rapidly spread all over its sources, especially the internet, the learning process became a necessity for the survival of institutions and organizations. It is the strongest organization that keeps pace with the knowledge and the needs of the customer. One of the strengths that an organization can have is the presence of highly capable and experienced educated individuals to compete in the market. The best learning is group learning as for the organization as a whole and not just at the individual level, where organizations and institutions are now facing many terms that are changing rapidly and permanently due to the emergence of the industrial revolution, so now

institution are forced to hire individuals who are familiar with these terms in order to be able to keep up with the changing environments and competition in the market(Burma, 2015). The process of obtaining the correct information from all sources at the right time is not easy, so it was necessary to use tools that help in the process of collecting information from its places such as the tools used in the (ETL) process , which is defined as a process in which data extracted from different sources then transferred, then it is placed in the data warehouse (Ramesh Sharda , Dursun Delen, 2013). The following figure shows the use of the ETL process to collect, analyze and store data in the repository.

Priya Nandini
ERCICSTR2203078

In-Silico Studies of Glycosyltransferase Enzyme in Exopolysaccharide Production

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Abstract

Glycosyltransferase belongs to a family of enzymes that moves stimulated sugar moieties to the acceptor substrate. GTF genes have been involved in the formation of bacterial exopolysaccharides (EPS), capsular polysaccharide and lipopolysaccharide. They are found in both prokaryotes and eukaryotes. In humans, they are involved cell signaling, adhesion, cancer and cell wall biosynthesis. As the interest in natural polysaccharides has expanded, EPS is considered for use in drugs, food and other industries and it can be likewise valuable for the agriculture and biotechnology sectors. Thermophiles can be a novel organism for the production of EPS as they possess a lot of properties such as high metabolism, produce physically and chemically stable enzymes and lower growth but higher end-product yields than similar mesophilic species which is valuable for industries. In this study, we have compared five thermophiles and five mesophilic to analyze the differences between glycosyltransferase enzymes using the in-silico approach. According to the result of physicochemical determination, the GRAVY value is found to be higher in mesophilic than in thermophiles. The Aliphatic index is higher in thermophile which is a positive factor for the increase of thermostability of the given protein. Primary structure analysis reveals that Alanine and Isoleucine are dominant in thermophiles as compared to mesophilic. Thermophiles are seen to balance positive and negative amino acids only. Thermophiles have fewer polar amino acids which indicate that they have a tendency to decrease destabilizing amino acids. In thermophiles and mesophilic most of the structure is alpha-helix followed by random coil which indicates true enzymatic activity and structural flexibility

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