UNITED RESEARCH FORUM
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## Joint Conference on

2<sup>nd</sup> International Conference of

# AI and Data Science

October 26 - 27, 2022 at Dubai, UAE

**Holiday Inn Express Dubai, Safa Park, and IHG Hotel**
**Address:** Al Wasl District Sheikh Zayed Road &
- Al Wasl Rd - Dubai - United Arab Emirates

# Scientific Program

**DAY 1**

*Joint Conference on*

*2nd International Conference of*
# AI and Data Science

**Wednesday**                    **OCT 26, 2022**

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## Day 1 - October 26, 2022

**11:30 - 11:45**  Introduction

**11:45 - 12:15**  Rapid Sustainable Governance based on Convolutional Neural Networks
**Dr. David Pastor Escuredo,** Universidad Politécnica de Madrid, Madrid, Spain

**12:15 - 12:45**  Natural Language Processing (NLP) for Cyber Security: detection of malicious (phishing) e - mails
**Dr. Sanja Seljan,** University of Zagreb, Croatia

**12:45 - 13:15**  Artificial Intelligence meets OCT: from signal features to deep learning trends
**Lev Matveev,** Senior Research Scientist, Institute of Applied Physics of Russian Academy of Sciences, Russia

### (13:15 - 13:45) Lunch Break

**13:45 - 14:15**  A Machine Learning Approach to Forecasting the Philippine Yield Curve
**Mr. Armin Paul Allado,** Bureau of the Treasury, Department of Finance, Philippines

**14:15 - 14:45**  Deep Learning and Fairmindedness towards Missing values
**Viji Venugopal Kochath,** Data Scientist/ Researcher R. K. University, India

**14:45 - 15:15**  Data in the Metaverse, from the Metaverse, of the Metaverse
**Girish Bajaj,** Metaverse Strategist at GB METAMATRIX, Dubai, UAE

**15:15 - 15:45**  Assessment of ground water pollutants using Internet of Things and edge computing techniques
**Dr.R. Sujatha,** Associate Professor, School of Electronics Engineering (SENSE), Vellore Institute of Technology, Vellore, India

**15:45 - 16:15**  New Approach: Social Media Algorithms Affecting Our Children's Learning Style at Schools.
**Maya Taraby,** Heriot Watt University

**16:15 - 16:45**  Life Lesson on the Application of Statistics to Solve Real - World Problems
**Kazmeen Maknojia,** Sr. Data Scientist, Dubai

**16:45 - 17:15**  Data - driven early - warning and rapid - response for disasters
**Dr. David Pastor Escuredo,** Universidad Politécnica de Madrid, Madrid, Spain

## Joint Conference on
## 2ⁿᵈ International Conference of
# AI and Data Science

**DAY 1**

**Wednesday**

**OCT 26, 2022**

## Crowne Ballroom

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| | |
|---|---|
| 17:15 - 17:45 | Teaching Arabic Language for Non - Native Speakers<br>**Dr. Loay Badran,** Associate Professor at Zayed University, Dubai, UAE |
| 17:45 - 18:15 | Consumer Data Protection and Its Impact in the Growth of Data Science<br>**Sangwen Keima,** Co - Founder and chairperson of Consuldata and Research Centre, Kenya |
| 18:15 - 18:45 | Image processing by discrete mathematical algorithms<br>**Assoc. Prof. DR. Maria Zdimalova,** Slovak University of Technology in Bratislava, Slovakia |

### Closing Ceremony

**DAY 2**

*Joint Conference on*

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# AI and Data Science

**Thursday**　　　　　　　**OCT 27, 2022**

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| | |
|---|---|
| 09:30 - 10:00 | Big Data Analysis for Health Information Access: towards Hospital Websites as Interactive Communication Channel<br>**Dr. Sanja Seljan,** University of Zagreb, Croatia |
| 10:00 - 10:30 | Auxiliary & Adversarial Learning for Medieval performance of singers Recognition<br>**Dr. Frederic Billiet & Imad Bekkouch,** IReMUS/SCAI/PHE Sorbonne University France |
| 10:30 - 11:00 | A survival prediction model for kidney cancer constructed by machine learning<br>**Min Zhao,** University of the Sunshine Coast, Maroochydore DC, Queensland, Australia |

**(11:00 - 11:15)  Coffee Break**

| | |
|---|---|
| 11:15 - 11:45 | IoT Machine Learning on Differentially Private Data<br>**Dr. Yuichi Sei,** The University of Electro-Communications, Japan |
| 11:45 - 12:15 | Real - time artificial intelligence instruction in teaching of surgical bimanual skills using virtual reality simulation<br>**Dr. Recai Yilmaz,** McGill University, Faculty of Medicine and Health Sciences, Montreal, Quebec, Canada |
| 12:15 - 12:45 | Federated Analytic and the future<br>**Mr. Ifeanyi Sebastian Obeta,** Data Scientist, University of Cambridge, UK |
| 12:45 - 13:15 | Machine learning and Statistical approaches to assess time series data in profitability analysis<br>**Shiemaa Adlan,** Data Scientist, Dubai, UAE |

**(13:15 - 13:45)  Lunch Break**

| | |
|---|---|
| 13:45 - 14:15 | Simple scalable benchmarks for realized covariance forecasts<br>**Dr. Andrey Vasnev,** University of Sydney, New South Wales, Australia |
| 14:15 - 14:45 | Deep Multi - Modal Network Based Automated Depression Severity Estimation<br>**Dr. Md Azher Uddin,** Heriot - Watt University Dubai, UAE |
| 14:45 - 15:15 | Australian housing prices: A big-data predictive model<br>**Dr. Rachida Ouysse,** University of New South Wales, Sydney Asutralia |

**DAY 2**

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# AI and Data Science

**Thursday**　　　　　　　　　　**OCT 27, 2022**

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| 15:15 - 15:45 | Wearable devices to monitor energy expenditure and sleep quality: state of the art and a new possible tool<br>**Roberto Cannataro,** Chemical Engineer, Food Technologist, Nutritionist, Italy |
|---|---|
| 15:45 - 16:15 | Is Ensemble Learning emerging to be the new gold standard for classification problems?<br>**Sriram Tigulla,** Head of Risk Analytics, Boubyan Bank, Kuwait |
| 16:15 - 16:45 | COVID-19 Pandemic in the New Era of Big Data Analytics in egovernment: Applications and Challenges\ Future Research Directions<br>**Rasha Abdin,** Researcher, AI and Data Science Associate |
| 16:45 - 17:15 | AI and Big data vs workforce<br>**Leonard Vuylsteke,** University of Cumbria, Dubai, UAE |
| 17:15 - 17:45 | Clustering in Feature - Rich Networks Using Data Recovery Approach<br>**Dr. Soroosh Shalileh (PhD in Computer Science),** Center for Language and Brain, HSE University, Myasnitskaya Ulitsa, Moscow, Russia |
| 17:45 - 18:15 | Machine learning approaches to classify malware data<br>**Saba Iqbal,** SOC Analyst, Dubai, UAE |
| 18:15 - 18:45 | The Role of Data Analytics in Various Industries<br>**Sajjad Tahir,** Senior Manager Business Insights MEA, Dubai, UAE |
| 18:45 - 19:15 | Data Analyics Potential for Telco Service Providers as a Source of Revenue<br>**Mo'nes Altarazi,** Business Analytics and Big Data from IE Business School - Waseela for Technologhy Consultations |
| 19:15 - 19:45 | Optimization Algorithms in Real Time Scenario<br>**Vijayalakshmi,** Associate Professor, Central University of Tamilnadu, India |
| 19:45 - 20:15 | Cyber Security in Smart Healthcare System<br>**Adil Bashir,** Assistant Professor, Deptt. of Computer Science & Engineering, Islamic University of Science & Technology Awantipora, Jammu and Kashmir, India |
| 20:15 - 20:45 | Effective Medical Data Curation for the Optimum Performance of Machine Learning and Deep Learning Models<br>**Chukwuebuka Joseph Ejiyi,** University of Electronic Science and Technology of China |
| 20:45 - 20:55 | Bayesian Dynamic Stochastic General Equilibrium Models<br>**Dr. Ana León - Gómez,** University of Málaga, Spain |

## Closing Ceremony

# Chairpersons and Heads of AI and Data Science Conference Committees

**Dr Sanja Seljan,** *University of Zagreb, Croatia*

**Dr Sandro Serpa,** *University of the Azores, Ponta Delgada, Portugal*

**Md Azher Uddin,** *Heriot-Watt University Dubai, UAE*

**Dr David Pastor Escuredo,** *Universidad Politécnica de Madrid, Madrid, Spain*

## Opening Keynotes



### Dr. David Pastor Escuredo
*Universidad Politecnica de Madrid, Madrid, Spain*

### Dr Sanja Seljan
*University of Zagreb, Croatia*

# Day - 1
## Oral Sessions

## Rapid Sustainable Governance based on Convolutional Neural Networks

## David Pastor-Escuredo[1,2,*]

*Philip Treleaven[1] [1]UCL[2] LifeD Lab*

## Abstract

Sustainable governance requires fast decision-making considering many variables, indicators and indexes. Boards need to rapidly integrate these variables to establish priorities for investment, monitoring, evaluation and decision-making. Current data-driven governance sticks to indicator-based time series and enriched reporting. We propose the use of Convolutional Neural Networks to produce decision patterns in real-time over priority maps. Priority maps are 2D image-like matrices with normalized heatmaps comprising a number of variables of observation and a number of instances (i.e. branches, customers, etc). Priority maps are an evolution of streetlight maps with a wider range of normalized values for each variable. A CNN-based workflow is applied to combinations of the priority map to establish a decision pattern that integrates all the complexity of the map. This approach is more suitable for Governance than single cell color-detection that humans normally perform.

## Biography

David Pastor-Escuredo is a Ph.D. from UPM in Artificial Intelligence and Complex Systems. He was a data-driven sustainability pioneer of several United Nations agencies (UNGP, WFP, UNHCR) in AI and Data for SDGs. Currently he works for UNICEF. He leads Digital Innovation projects and Collective Intelligence managing partnerships in UCL and with MIT research centers and labs. He is also a member of the Ethics and Digital Revolution group of Climate-KIC European Mission for neutral cities. He works in Data and AI for Healthcare within the program Catalyst Europe EIT Health / MIT and was awarded by EIT Health as best Catalyst Europe'20 project and Rising Star. He owns LifeD Lab where he implements cutting edge innovation for a better future within these initiatives.

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### Big Data Analysis for Health Information Access: Towards Hospital Websites as Interactive Communication Channel

## Dr. Sanja Seljan

*University of Zagreb, Information and Communication Sciences - Faculty of Humanities and Social Sciences, Zagreb, Croatia*

## Abstract

The aim of the analysis is to present publicly available health information sources that can be used to gain insight into health information needs. Hospital websites are widely used the access point for information search or for communication. Information presented on hospital websites should be presented in clear, up-to-date and understadable way enabling easy information access and interactive communication.

The research presents Big Data analysis performed on three types of data: i) hospital websites offering information on healthcare services and ii) social media monitoring of social networks iii) analysis of blogs and forums as communication tools. Hospital website analysis is performed according to five dimensions: Technical items, Hospital information and facilites, Admission and medical services, Interactive online services and External activites. Social media monitorng can reveal sentiment analysis of the specific instiution or service, as well as mentions or time of the specific interest. Blogs and forums represent digital meeting places where users' needs can be detected and analyzed.

All three types of Big Data sources can be used for creation of digital interactive online services for health-related puroposes. Digital health services and applications are one of indicators of the *Global Digital Health Index* that include use and assessment of digital health systems, services and public facilites.

Creation of digital interactive communication tools on hospital websites would reperesent an added value in order to retrieve multilingual health information in time, to augment accountability practices and meet public expectations in health management. Well-designed, multilingual and functional website can contribute to satisfaction of domestic population and tourists and influence institution evaluation. Quality of information presented on hospital websites is relevant not only for patients but also for other stakeholders, such as authorities, policy makers, hospital managers and healthcare service providers.

Key words: Big Data, health, analytics, interactive tools, Global Digital Health Index

## Biography

Dr. Sanja Seljan is full prof., tenured, in Information and Communication Sciences, Faculty of Humanities and Social sciences - University of Zagreb, Croatia. She is board member of the National Scientific Field Committee for Information and Communication Sciences, Faculty board member, formerly Deputy Head of the Department and Head of Chair, researcher, Ph.D. supervisor and consultant. Author of more than 80 research and professional papers, invited and keynote speaker world universities, conferences and in European institutions. Her expertise is natural language processing (NLP) and text mining, machine translation, data science, language technologies in business, data analytics and visualization. Languages: English, French, Italian.

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## Artificial Intelligence Meets OCT: From Signal Features to Deep Learning Trends

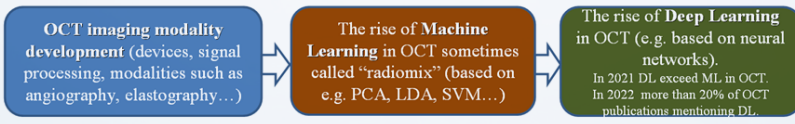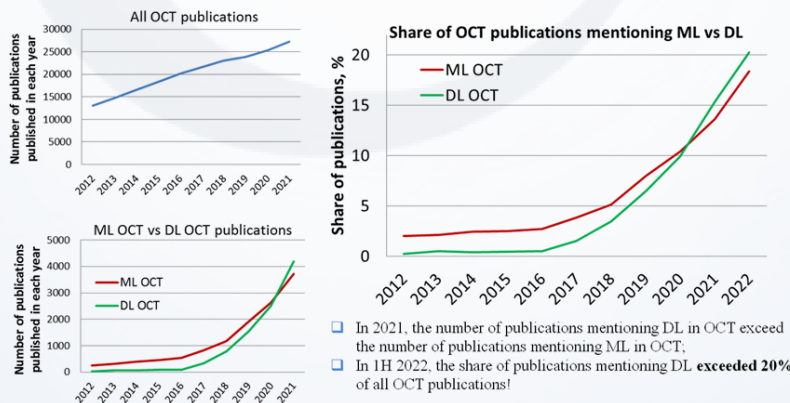### Lev Matveev

[1]*Russian Academy of Sciences, Russia*

## Abstract

Optical coherence tomography (OCT) is the medical imaging technique that fills the gap between ultrasound and microscopy. It is already standard diagnostic tool in ophthalmology and emerging diagnostic tool for other tissues and pathologies (in oncology, skin diagnostics, mucosa diagnostics etc.). Due to OCT interferometric nature the OCT signals contain a lot of features related as to optical properties (optical amplitude and phase and polarization) as well as speckle structure (spatial distribution functions, speckle contrast, temporal evolution etc.). OCT technique is rich in novel modalities for structural and functional imaging such as angiography, elastography, optical attenuation coefficient imaging, polarization-sensitive imaging and speckle contrast imaging. In the last decade the OCT implementation for non-ophthalmological applications are based on utilizing the signal features via machine learning approaches often called «radiomix». Currently, we are in the phase of the rise of deep learning methods in OCT. This presentation will review 1) how the OCT signal features are related to the tissue microstructure and processes (such as flows, deformations etc.); 2) what new new modalities based on these features were developed; 3) how these modalities and features were used for machine learning; 4) in what fields OCT deep learning is currently developing; 5) what tasks and applications of deep learning in OCT are most promising.

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## Biography

Dr. Lev A. Matveev is a signal & image processing and statistical machine learning professional. He obtained his MSc at the University of Nizhny Novgorod (Radiophysics Dept., 2007) and PhD at Institute of Applied Physics of the Russian Academy of Sciences (IAP RAS, 2010) in nonlinear acoustics diagnostic of heterogeneous materials. Currently his research interests are focused on Optical Coherence Tomography (OCT) and its applications. Dr. Matveev authors 50+ peer-reviewed scientific papers and is a Senior Research Scientist at the Russian Academy of Sciences.

## A Machine Learning Approach to Forecasting the Philippine Yield Curve

**Armin Paul D. Allado, Roland Szanelle B. Bassig, Aejan E. Baldo, Halle Megan L. Bata, Timothy Ron David M. Diaz, Mia Ysabella Gaviño, Shivam Pujara**

*Bureau of the Treasury, Department of Finance, Philippines*

## Abstract

There is a growing corpus of literature on the use of machine learning in yield curve analysis and prediction, with many highlighting the performance gains of machine learning models over standard econometric analysis. The study presented is the first to apply machine learning methods to the context of Philippine yield curve. Several machine learning models were implemented in analyzing the different tenors of Philippine Treasury securities: k-nearest neighbors (kNN), random forest, and support vector machines (SVM). These were compared to standard sensitivity analysis using ordinary least squares (OLS) estimation. The results are promising in that the machine learning models significantly explain the variation in all tenors. The results also highlight the potential benefits of using machine learning approaches for yield curve forecasting, particularly in stress testing practices and fixed-income fund pricing. Given the applicability of machine learning methods to the Philippine context, the benefits can also be extended to yield curve analysis of emerging sovereigns in southeast Asia.

## Biography

Mr. Armin Paul Allado serves as the Division Chief of Risk Management Division for the Bureau of the Treasury, supervising the risk analytics and monitoring function of the agency. He is also a part-time lecturer in Operations Research at the Ateneo de Manila University and University of Asia & Pacific. Prior to his current post, he served as Chief Market Strategist for the Fund Management Division and Technical Assistant for the Debt and Risk Management Division also at the Bureau of the Treasury. He is currently taking MSc in Analytics at Georgia Institute of Technology. He previously finished MSc in Finance at the London School of Economics and MSc in Applied Mathematics at the University of the Philippines in Diliman. He graduated BSc in Management Engineering, Minor in Financial Management.

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## Deep Learning and Fairmindedness towards Missing values

### Viji Venugopal Kochath

*Data Scientist/ Researcher R. K. University, India.*

## Abstract

Machine Learning (ML) and Deep Learning (DL) based predictions mainly depend on the data collected and fed to the algorithms. Missing data can happen due to several reasons such as incomplete responses, ambiguous response choices, dropouts in longitudinal data, etc. which affect the development of robust ML algorithms and sometimes contribute to a black box in DL algorithms. This paper discusses the impact of missing values and demonstrates a novel imputation technique implemented on Google's state-of-the-art transformer named Temporal Fusion Transformer (TFT). This paper compares the output of the original TFT algorithm where missing data is imputed using LOCF (Last Observation Carried Forward) imputation with novel imputation techniques where data is imputed based on its type such as dependent or independent variables, inter-related patterns among the missing values compared to non-missing values based on Selected Mean Value Imputation technique. This paper also showcases the increase in the learning capacity of the network by using Variable Selection Networks (VSN) by stacking multiple GRN layers on top of the VSN layer. The result of imitated dataset shows that the proposed imputation methods with the VSN algorithm have a noticeably better performance than conventional methods. Besides, they can also handle extreme column-wise missing data cases which are not addressed in TFT.

## Biography

Viji is a data science enthusiast having 11 years of experience in Data Analysis, worked across all aspects of data from engineering to building sophisticated visualizations, machine learning models and experiments. Currently working as a faculty with GEMS education and as a researcher at Rise Hydroponics India to optimize crop growth using Machine Learning and Deep Learning algorithms to build sustainable food security for the future. She has also proved her skills as a data engineer at Union Bank of India and was appointed as a data analyst at Central Salt and Marine Central Research Institute (CSMCRI), one of the top performing national R&D laboratories in India which are based on the salt and marine chemicals analysis, water desalination and purification, renewable energy, salinity tolerance and waste management. While working with an educational institution in UAE she led a Machine learning project about "21st Century Transportation" for Think Science UAE (2018) event. She is currently pursuing PhD in Deep Learning and previously completed her degree & master's degree in Computer Applications (2012) and has done a diploma in Machine Learning Specialization and Deep Learning from IIT Roorkee (2020). Her current research interest is Artificial neural networks, backpropagation algorithms in deep learning, and exploratory data analysis. Etc.

## Data in the Metaverse, from the Metaverse, of the Metaverse

### Girish Bajaj

*GB METAMATRIX. INDIA*

## Abstract

### The objective of the presenation:

With the metaverse opening up new avenues/medium for businesses, its successes is depedent upon utilizing/optimizing data effectively. In past, companies have used data to analyse and extract/ extrapolate information for business purposes, be it for sales, marketing, market share or customer retention. With the metaverse, a humoungous added layer, of data can do and its potential to enable brands to connect with audiences, increase ROI.

As spending just 20 minutes in a VR simulation leaves nearly 2 million unique recordings/ data elements of body language.

DATA IN THE METAVERSE, FROM THE METAVERSE, OF THE METAVERSE, is to understand the how the privacy and security of the data is at threat of the users, how best to regulate it as more and more users will join the metaverse and expected. As 55% time of users activities will be spent in the Metaverse, in the future. Even moderate usage of metaverse will increase global data usage by 20 times over a decade, as per a Credit Suisse report.

It's essential that guidelines are set to ensure privacy and safety while business models are being established. So policymakers should carefully consider how existing or proposed data protection laws can provide consumers with meaningful rights and companies with clear obligations regarding AR/ VR/MR/XR data. Hardware makers should consider how XR data collection, use, and sharing can be performed in ways that are transparent to users, bystanders, and other stakeholders.

How will these companies, identify what kind of data is getting captured to add more value to their data? So will AI/ML/automation be used, within the metaverse, and other disruptive technologies?

Given the complexity and emergence of many of the metaverse's enabling technologies, to avoid misuse of data, better understand the implications of our choices in these virtual worlds.

As AI has helped Enterprises and Governments grow their businesses and know about their customer/ client/citizen, by extracting value from data, and in the future within the metaverse, regulation is important.

Need to create clear data controls and guardrails, it could expose people using the metaverse to excessive data collection and abuse of their data and privacy.

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## Assessment of Fluoride Contamination and other Pollutants in the Groundwater using Internet of LoRa Things (IoLT) and Edge Computing Techniques.

### Dr. R. Sujatha

*Associate Professor in the Department of Embedded Technology, School of Electronics Engineering, VIT University, Vellore Campus*

## Abstract

Water is necessary for life, but water pollution is a serious threat that we face today. Water quality has a direct impact on public health and the environment. The presence of various types of pollutants, ranging from organics to heavy metals, turbidity, hardness, and chemical concentrations, can have serious environmental and marine life consequences. Fluoride levels in water are high in most part of the world due to Industrialization. Fluoride consumption above a certain threshold level causes skeletal fluorosis, dental fluorosis, and, in some cases, blindness. The characteristics of ground water quality can be assessed using Internet of Long Range (LoRa) enabled edge nodes along with Low Power Wide Area Network (LPWAN) gateway. Before validating the results, LoRa edge node sensors will be calibrated on a regular basis. Resource scaling is possible by increasing the number of gateways and edge nodes, and hence more ground water samples can be covered. Each gateway can handle more than 50 edge nodes and listen to multiple uplink frequencies at the same time. The proposed LoRA technology for water contamination monitoring has an increased battery life time for around ten years, thus lowering the battery replacement costs for the sensors. The groundwater samples will be collected in the in-situ region and analysed for TDS, salinity, and EC levels using LoRa sensors. With the collected raw data, an optimised ensemble based classifier will be developed to predict the Water Quality Index (WQI) and compare it with WHO standards. The WQI index levels at the in-situ region can be visualized through an interactive real-time dashboards using power BI tools. The delivery pipeline includes all stages of edge level computations and noise filtering.

Keywords: Groundwater contamination, Internet of LoRa Things , Edge computing, Low power wide area network, Water Quality Index.

## Biography

Dr. Sujatha is an Associate Professor in the Department of Embedded Technology, School of Electronics Engineering, VIT University, Vellore Campus. She received her Ph.D from Anna University, Chennai in the field of information security. She has 23 years of teaching and research experience in reputed Institutions. Her research interests includes Industrial Internet of Things, Data Engineering in Cloud and Information Security in cloud platform. She received a speaker Award at the UK Cloud Asia Summit-2019, Cambridge University, UK. Dr.Sujatha has organized an Industry Academia Conclave in the IoT domain at VIT, symposium on "AI and Cloud computing" at Purdue University, Indiana Polis, USA and a symposium on "Recent Trends in Engineering" at UTeM, Malaysia jointly with VIT. She has delivered technical lectures in the cutting edge technologies for national and international students, faculty communities. She has published research articles in peer-reviewed national, international journals and conferences. Received a DST SERB CRG grant for IoT-LoRa enabled detection and prediction of pollutants in ground water in an open dumping yard. Received Seed Grant for LoRa enabled water pipeline monitoring and green house management. She is a AWS certified cloud computing practitioner and trainer. She has completed a consultancy project in "Industry

automation through cloud-based environmental factor monitoring" for Transcend Solar Systems, Chennai. Dr.Sujatha is the In-charge and active member of "Intelligent Industrial IoT and computing lab" at the School of Electronics Engineering, VIT,  faculty representative and a mentor  for the students IoT Club, at VIT.Currently her focus is on achieving secured long-range data connectivity for Industrial IoT using 5G, LoRa networks and Block chain..

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### New Approach: Social Media Algorithms Affecting Our Children's Learning Style at Schools.

## Maya Taraby

*Msc. of Sciences in Artificial Intelligence and Machine Learning, Dubai, UAE*

## Abstract

Recently, every one of us is using Tik Tok. Tiktok is a social platform used by more than 689 million monthly active members in 155 countries around the world. It allows its users to create, discover, and share videos between 30 seconds and 3 minutes long. These videos can include educational content, dancing, life hacks, art creation, comedy sketches, and much more. The app is set up in a way that allows users to share these videos with people who have similar interests to them. *(Algorithm and embedded machine learning to be discussed in PowerPoint)*

What was noticeable in the research is that people and especially youngsters are relying on this platform to learn, due to the rapid and easy process. A series of questions to be asked at this point "Are our kids' brains responding to the fast learning process? Should we change the learning style provided in schools? If students are addicted to short information recipients, should school sessions be reduced and limited by 30 minutes rather than 50 min? *(These questions are to be supported with studies percentages in PowerPoint and discussed)*

## Biography

Maya Taraby graduating this year from Heriot-Watt. Maya Taraby majored in Artificial Intelligence. She is totally impressed with artificial intelligence and data science, and how it is used in socially-driven projects. She is passionate about science, and women empowerment in STEM fields.

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## Life Lesson on the Application of Statistics to Solve Real-World Problems

## Kazmeen Maknojia

*Data Scientist / Data Visualization Expert / Statisticians/ Machine Learning Engineer, Dubai, UAE*

## Abstract

I would share my experience of how I have used hackathons to enter the data science field with the ability to understand business problems and solve them using proof of concept and use cases. "As the field of data grows, it is important to keep an open mind and evolve with it. Be responsible and realize how data can solve business problems. Always ask yourself how data can be used to positively impact the surrounding lives, and use that to guide your design and development".

## Biography

I am an accomplished Senior Data Scientist having a strong background in statistics with 6+ years of experience, working in renowned organizations and successful start-ups. Capable of creating, developing, testing, and deploying highly adaptive, diverse services to translate business and functional qualifications into substantial deliverables.

## Data-driven early-warning and rapid-response for disasters

## David Pastor Escuredo[1,2,3]

[1]UCL, UK[2]  UNICEF[3]  LifeD Lab, Spain

## Abstract

Natural hazards become into high-impact human disasters when there is not a proper humanitarian and human response. Moreover, global change changes how livelihoods evolve and work and affect internal and international migrations. The humanitarian system and humans require computational tools to react and anticipate to large-scale social phenomena and drive to positive impact. By taking early actions and predicting dynamics between populations and global change including climate chane, livelihoods are protected minimizing the socio-economic impact at mid and long term. In emergencies and forcibly displaced population phenomena, humans and land become a highly timely system that can be improved by Data and Artificial Intelligence. Not only earth observation systems can be deployed, but a comprehensive societal sensing system can be built for early warning and rapid assessment and response. By integrating remote sensing with small data sensors and big data sources, we can exploit Artificial Intelligence not only to trigger humanitarian action, but to compute estimated social, economic, human, infrastructure and land dynamics including impact assessments. Multi-indicator systems can be leveraged for humanitarian actors but also to create human protection based on Collective Intelligence beyond current systems based on social networks. This implies designing methods where AI and humans interact in real-time for better awareness and more automated-systemic decision making. Eventually, land and livelihoods can be better protected with seasonal and event-based indicators to minimize large scale socio-economic impact and increment shor-term and long-term resilience world-wide.

Keywords: Hazards; Resilience; Early Warning; Impact Assessment, Rapid Response; Disaster; Collective Intelligence; Climate, Livelihoods

## Biography

David Pastor-Escuredo is a Ph.D. from UPM in Artificial Intelligence and Complex Systems. He was a data-driven sustainability pioneer of several United Nations agencies (UNGP, WFP, UNHCR) in AI and Data for SDGs. Currently he works for UNICEF. He leads Digital Innovation projects and Collective Intelligence managing partnerships in UCL and with MIT research centers and labs. He is also a member of the Ethics and Digital Revolution group of Climate-KIC European Mission for neutral cities. He works in Data and AI for Healthcare within the program Catalyst Europe EIT Health / MIT and was awarded by EIT Health as best Catalyst Europe'20 project and Rising Star. He owns LifeD Lab where he implements cutting edge innovation for a better future within these initiatives.

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## Teaching Arabic Language for Non-Native Speakers

### Loay Badram

*Associate Professor at Zayed University*

## Abstract

The acquisition of language has always been a crucial issue for many language instructors and interested researchers. In this respect, teaching Arabic language as a foreign language to non-native speakers would involve further research that we seek to achieve in this present paper, which reviews and investigates the process of second language acquisition (SLA). In this paper, the researcher would question the principles and approaches that provides a framework to the teaching of Modern Standard Arabic (MSA).

The paper will rigorously define the concept of second language acquisition (SLA) and the way it can be different from foreign language pedagogy. It will also present a general overview on the studies that have been carried out within the area of Arabic learning and teaching as a second language (L2). In brief, according to various academic sources, foreign language pedagogy differs entirely from second language acquisition in that the former revolves around the various approaches, methods, and techniques of how a foreign/second language should be taught whereas the latter is more about how a language is learned. To put it differently, foreign language pedagogy focuses on the teacher's perspective, but second language acquisition puts the learner in the center of the teaching and learning process.

The paper also moves to discuss the formulation and execution of learning objectives in addition to the design of goal oriented instructional and teaching materials. Moreover, the researcher reflects on the major observations about second language acquisition in the past half century. The paper will conclude by some practical implications and findings on the process of teaching, textbook design, and testing.

Keywords: Teaching Arabic, Non-Native Speakers, language acquisition, Modern Standard Arabic.

## Biography

Dr. Loay Badran Associate Professor at Zayed University. Dr. Loay Badran earned my BA in Arabic Language and Literature after which I received MA in Teaching Languages as a Second Language for non-native speakers. I completed my Ph.D. in 2013 in the field of linguistics. Over the last 6 years, I have worked as an Associate Professor at Zayed University. As for research, I am interested in Universal grammar and the relationship of language to thinking, and how we see the world through our languages.

## Consumer Data Protection and its Impact in the Growth of Data Science.

### Sangwen Keima Apollo

*Consuldata and Research Centre, Kenya.*

## Abstract

One of the most significant developments in recent years has been the expansion of data science. This is a term that refers to the scientific process of data analysis and interpretation. Data science has become an important tool in many fields and it has also contributed to the growth in the use of data from consumers. Although there are many ethical considerations when collecting data, this is something that everyone should actively participate in deciding. Collecting data from consumers allows companies to effectively target their sales and increase profits.. There is also strong incentive for collecting large amounts of data, as this allows for faster and better processing and analysis.

The growth in the use of data has led to a rise in data privacy concerns. People are worried about the misuse of their personal information. This is especially true for countries with weak privacy laws such as across Eastern Europe and Africa. There is a push towards data privacy to maintain data integrity. It is important to protect people's data without restricting innovation or restricting freedom of speech. The best way to do this is through transparent laws and processes for protecting people's data. As different countries enact laws to safeguard data privacy, data scientists grow concerned of the quality and amount of data that will be available for insightful use. Consequently, data scientists should be prepared for a future impacted by consumer data protection laws as they ensure realization of the core purpose of the profession.

## Biography

Sangwen Keima is the Co-Founder and chairperson of Consuldata and Research Centre, a Kenyan firm that deals in research and consultancy in data analysis. Similarly, he is the founder of the 97Club Data Science Community, which mentors and trains young people in data science and machine learning in Kenya. With a background in Actuarial Science, Sangwen is active in promoting the growth of data science in Kenya and in equipping of young people with the much-needed skills to build the profession. His vision is to transform the society through the disruptive solutions of data science, machine learning, and associated technologies.

## Image processing by discrete mathematical algorithms

## Assoc. Prof. Dr. Mária Ždímalová

[1]*Slovak Unievrsity of Technology in Bratislava, Slovakia Faculty of Civil Engineering Department of Mathematics and Descriptive Geometry*

## Abstract

In this talk we present innovative approach to image processing from discrete mathematics. We present algorithms dealing with image analyses. Algorithms are based on discrete mathematics as well as graph theory. We deal with graph theoretical algorithms algorithms using max flow algorithms in the networks and Dijskra's algorithm in intelligent scissors. Speccialy we focusse on Graph Cut algorithm and the algorithm called Intelligent scissors. We analyse biological data, cells, membranes of cells, radar data and others. In this work we have a cooperation with Medical Faculty of Commenius University in Bratislava. We cooperate with the Institute of Imunology, the Institute of Anatomy, the Institute of Medical Physics, Biophysics, Informatics and Telemedicine. We implemented, optimized and also creted new softwares on speccial requests of biological and medical data scientist. Some data were extracted also on microscops on Medical faculty and also results were verified by the doctors and bilogists.

Consequently we propose others applications in biology, medicine and geography. Our next aim is to exceed this work into analyses of technical materials and buildings.

In this last part we focus on one speccial algoritm, called GrabCut. This algorithm is based on the combining of graph cut methods, data clustering (k – menas algorithm), mixture models and also image processing. We combine statistics, data clustering, Gaussian mixture models, and also image segmentation techniques. Consequenly we apply these techniques into the analyses of medical and biological image data. We provide a better segmnetation on these data sets.

## Biography

My webpage: https://www.math.sk/wiki/zdimalova

Education
- 2019 June, doc. Degree, Associate professor, field: Applied Mathematics
- Slovak University of Technology in Bratislava, Faculty of Civil Engineering
- Department of Mathematics and Descriptive Geometry, Slovakia
- Title of the Dissertation: Large networks and their properties
- 2010 November, Ph.D. Degree, Applied Mathematics, Slovak University of Technology in Bratislava, Faculty of Civil Engineering, Department of Mathematics and Descriptive Geometry, Slovakia

- Title of the Dissertation: Large vertex – transitive and Cayley graphs and digraphs of given degree and diameter
- 2003 – 2009 Ph.D. Studies at Slovak University of Technology in Bratislava, Slovakia, Faculty of Civil Engineering, Department of Mathematics and Descriptive geometry
- 2003MSc. Degree, Comenius University in Bratislava, Slovakia, Faculty of Mathematics, Physics and Computer Science
- 1998 – 2003 Master Studies, Mathematics and Physics
- Additional information on education: 2006 – 2007 E – learning courses from Projective Geometry and Chapters for Teaching of the Mathematics – certificates, Comenius University in Bratislava

Research

- Graph Theory
- Uncertainty Modelling
- Graph Cutting
- Data Mining
- Education in Mathematics
- Bio-Informatic

Maria Zdimalova currently works at the Department of Mathematics and Constructive Geometry, Slovak University of Technology in Bratislava. Maria does research in Applied Mathematics, Algebra and Graph Theory. Their current project is 'Arch Math: Mathematics and Architecture, Design, Fashion, Art,.' Algebraic Graph Theory as well as Graph Algorithms in Image Processing.

Disciplines

- Applied Mathematics Skills and expertise
- Discrete Mathematics, Graph Theory, Applied Mathematics, Combinatorics, Algebra, Graph Algorithms, Graphs, Uncertainty Analysis, Image Processing, Mathematics Education, Uncertainty, ART IN MMATH, Theoretical Computer Science, Mathematical Modelling Languages
- German, English, Czech

A member of Editorial Team:

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Revisions: she partipcipated in  of the committe in the international Czech – Slovak student university many years and 2018, 201( in Italy for 2019- Faces of Geometries, Member of scientific committe of the conference From Agnesi to Mirzikhani, Milano, Polytecnica de Milano, May, Italy 2020- Faces of Geometries, II Second Edition, Member of scientific comitte of the conference From Agnesi to Mirzikhani, Milano, Polytecnica de Milano, May, Italy

External examiner for PHD:

- South Afrika
- Ethiopia, Afrika

Project: Bio - informatics: Graph theory approach and others methods to image processing and project Arch Math
Publications, more than 50 international scientific journals, 30 indexed in Scopus and Wos.

# Day - 2
# Oral Sessions

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## Big Data Analysis for Health Information Access: towards Hospital Websites as Interactive Communication Channel

## Dr. Sanja Seljan

*University of Zagreb, Information and Communication Sciences - Faculty of Humanities and Social Sciences, Zagreb, Croatia*

## Abstract

The aim of the analysis is to present publicly available health information sources that can be used to gain insight into health information needs. Hospital websites are widely used the access point for information search or for communication. Information presented on hospital websites should be presented in clear, up-to-date and understadable way enabling easy information access and interactive communication.

The research presents Big Data analysis performed on three types of data: i) hospital websites offering information on healthcare services and ii) social media monitoring of social networks iii) analysis of blogs and forums as communication tools. Hospital website analysis is performed according to five dimensions: Technical items, Hospital information and facilites, Admission and medical services, Interactive online services and External activites. Social media monitorng can reveal sentiment analysis of the specific instiution or service, as well as mentions or time of the specific interest. Blogs and forums represent digital meeting places where users' needs can be detected and analyzed.

All three types of Big Data sources can be used for creation of digital interactive online services for health-related puroposes. Digital health services and applications are one of indicators of the *Global Digital Health Index* that include use and assessment of digital health systems, services and public facilites.

Creation of digital interactive communication tools on hospital websites would reperesent an added value in order to retrieve multilingual health information in time, to augment accountability practices and meet public expectations in health management. Well-designed, multilingual and functional website can contribute to satisfaction of domestic population and tourists and influence institution evaluation. Quality of information presented on hospital websites is relevant not only for patients but also for other stakeholders, such as authorities, policy makers, hospital managers and healthcare service providers.

Key words: Big Data, health, analytics, interactive tools, Global Digital Health Index

## Biography

Dr. Sanja Seljan is full prof., tenured, in Information and Communication Sciences, Faculty of Humanities and Social sciences - University of Zagreb, Croatia. She is board member of the National Scientific Field Committee for Information and Communication Sciences, Faculty board member, formerly Deputy Head of the Department and Head of Chair, researcher, Ph.D. supervisor and consultant. Author of more than 80 research and professional papers, invited and keynote speaker world universies, conferences and in European institutions. Her expertise is natural language processing (NLP) and text mining, machine translation, data science, language technologies in business, data analytics and visualization. Languages: English, French, Italian.

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## Auxiliary & Adversarial Learning for Medieval Performance of Singers Recognition

## Dr.Frederic Billiet & Imad Bekkouch

*IReMUS/SCAI/PHE Sorbonne University France*

## Abstract

Convolutional Neural Networks have opened the gate for human-expert level performance in Computer Vision for many different applications. However, the biggest fear when deploying such large models to the real world is their ability to handle new and different data. Domain Adaptation (DA) is a field in machine learning that tries to solve the model's dependency on the training data. One powerful approach to DA is auxiliary learning where the model is trained on the task but also on an extra task that allows stabilization of the model and reduces overfitting. Another approach that doesn't use any extra data is the Adversarial approach which leverages the unsupervised data and forces the model to extract domain-independent features.

These methods are especially important in the setting of medieval and historic manuscripts which are quite rare and often aren't very clear. In our lab SCAI-Sorbonne University , we are applying DA techniques to help build models able to recognize Singing scenery in medieval manuscripts in order to build inspiration for the reconstruction of the Notre-Dame cathedral in Paris.

Partnership: SCAI-Sorbonne University (https://scai.sorbonne-universite.fr/)  and PHEND - Past Has Ears EU JPI Cultural Heritage project PHE  Sorbonne University

## Biography

Frédéric BILLIET is actually Professor of Medieval Music at Sorbonne University, Vice-Dean of the Faculty of Art and Humanities and co-director of the Organology/Iconography program in the Institute of Researches in Musicology (IReMUS - https://www.iremus.cnrs.fr/).  His major fields of research are the medieval musical iconography and the soundscapes of the Middle Ages. He is responsible for the research program on medieval musical iconography MUSICONIS "the representation of sound in the Middle Ages" supported by the ANR and by IReMUS (http://musiconis.huma-num.fr) and the SCAI Sorbonne University (https://scai.sorbonne-universite.fr/). He is currently engaged in the PHE program (http://pasthasears.dalembert.upmc.fr/doku.php/phe)  with the acousticians of Sorbonne University.

## 2nd Speaker Biography
## Biography

Imad Eddine Ibrahim BEKKOUCH is PhD candidate at Sorbonne University, Paris, France with the Sorbonne Center for Artificial Intelligence working on Knowledge Graphs and Computer Vision models for Medieval Manuscript Recognition. He received his B.S. degree in Computer science  from  Abdelhamid Mehri Constantine 2 University, Algeria in 2018. He has completed his  M.Sc. in data science at Innopolis University.  His  research  interests are domain adaptation, computer vision, and deep learning.

## A Survival Prediction Model for Kidney Cancer Constructed by Machine Learning

### Min Zhao

*School of Science, Technology and Engineering, University of the Sunshine Coast, Maroochydore DC, Queensland, 4558, Australia*

## Abstract

Comprehension of the complex obsessive cycles related with malignant growth anticipation might illuminate the best treatment system for patients. With collected malignant growth genomics information, it gives a sub-atomic premise to run the endurance investigation utilizing different sub-atomic highlights. Be that as it may, the colossal sub-atomic highlights, for example, a great many quality articulation elements might weaken the prognostic expectation power. In this paper, we investigate whether high-throughput quality articulation information can add to the anticipation of disease patients. By zeroing in on two sorts of kidney disease patients, we developed endurance expectation models dependent on Cox corresponding perils and irregular endurance woods to reflectively foresee the endurance of patients. Albeit the articulation information based endurance models worked in this review are worse performed than those clinical element based models, we observed that the endurance expectation force of the sub-atomic models could be improved by incorporating clinical factors. For instance, the miRNA and mRNA articulation information could work on prescient power in an associate of around six many Kidney Renal Clear Cell Carcinoma (KIRC) patients. Moreover, we endeavored to separate the fundamental mRNAs/miRNAs from the prescient model that essentially affect the prescient power. The further utilitarian and writing audit uncovered that these driving cancer suppressive and oncogenic miRNAs have significant impact on tolerant endurance. Taking everything into account, our review checked that the huge scope quality articulation information could work on the prescient force of kidney malignant growth endurance models. Notwithstanding, our investigation additionally show the clinical elements are as yet the fundamental variables for endurance examination. In this way, more advanced highlight determination and information separating may serve to address the sub-atomic heterogeneity in the malignant growth genomic information.

## Biography

Dr. Min Zhao is a Senior Lecturer focusing on bioinformatics and genomics at University of the Sunshine Coast. Dr. Zhao has led an emerging group to integrate multiple-dimensional omics data generated. Dr. Zhao is an editorial board member of Genomics, BMC medical genomics, and has been invited to review manuscripts from those leading journals in the bioinformatics field, such as Nucleic acids research and Bioinformatics. He also has been appointed as Program Committee member for six international bioinformatics conferences.

## IoT Machine Learning on Differentially Private Data

### Yuichi Sei

*The University of Electro-Communications, Japan*

## Abstract

IoT technologies have greatly improved people's convenience, and in recent years, the sharing of such IoT data has been promoted. At the same time, however, privacy leaks due to unexpected combinations with several data, and the existence of sensor data with errors are major issues. In this research study, we develop an IoT privacy-protection data analysis platform that can grasp and control privacy risks, as well as perform machine learning and statistical data analysis both safely and precisely. The goal of this study is the development of software that can safely handle large amounts of data with missing or erroneous data. The existing methods guarantee privacy protection within the range of data assumed beforehand, but in this research study, privacy protection is provided for combinations with unexpected data. Although the previous privacy protection data mining fields have targeted accurate data, this research study targets a large number of types of data: data that change dramatically in terms of type, accuracy, and quantity, and data with errors. A major challenge lies in targeting open, unmaintained, and dynamic data, rather than static data sets maintained in a closed world.

## Biography

Yuichi Sei received a Ph.D. degree in information science and technology from the University of Tokyo in 2009. From 2009 to 2012, he was with the Mitsubishi Research Institute. He joined the University of Electro-Communications in 2013 and is currently an associate professor in the Graduate School of Informatics and Engineering. He is also a visiting researcher at Mitsubishi Research Institute and an adjunct researcher at Waseda University. His current research interests include artificial intelligence, privacy-preserving data mining, and software engineering.

## Federated Analytic and the Future.

# Sebastian Ifeanyi Obeta[1], Dr Kamran Mahroof[1], Dr Enrico Grisan Cambridge University

*Bradford University London Southbank University Dorcas Oluchukwu Ibegbu Bradford University*

## Abstract

It becomes ironic that the geometric increase in data and big data creates a bottleneck for researchers in some fields, such as the genome, with decries centred on a lack of data. It, therefore, suggests the need for big data to be pulled into one central location or raises the need to have an extensive data storage infrastructure. In many applications, the data generated sits in different silos, creating significant concerns about privacy and confidentiality. The lack of data leads to different strategies like data augmentation and synthetic data to enhance the performance and results of machine learning models. It is a known fact that the machine learning model performs better and is more accurate when the dataset is rich and sufficient. On the other hand, machine learning frequently displays unexpected and startling behaviours and creates unfairness in machine-learned models through bias. If the original dataset has biases, the data supplemented from it will also have biases. As a result, determining the best data augmentation approach is critical. Regarding the practical applicability of decentralised machine learning schemes, many significant machine learning algorithm questions still need to be answered. Considering the geometric increase of data through the internet of things, edge computing technologies, which cut across different applications and devices and acquire the 5 V's (velocity, variety, veracity, value, volume). Data are generated, transported, and analysed in large quantities in an edge-cloud computing environment. In many applications, the edge devices and the data generated in the edge belong to heterogeneous owners, which raises data privacy issues. If analytics is to be brought to the different data silos, it raises more concerns about data privacy. Federated analytics brings analytics to data, extracting insights from data without any data being stored in one location. Federated learning remotely trains machine learning models and feeds the federated learning model aggregated prediction results. Federated learning is a subset of federated analytics. In this research, we x-rayed different ways federated analytics/learning addresses algorithmic challenges, data partition, privacy concerns, its mitigation strategy, and how to resolve third-party participation in the training processing through blockchain technological concept.

## Biography

Sebastian is a Data Scientist with a good track record in conceptualizing and implementing analytical Insights with commendable managerial ability to motivate a team for success. He has broad-based experience with a demonstrated history of working in the financial institution, Telecommunication, and Health sector.

He is data scientist/Analyst at the University of Cambridge in United Kingdom a cofounder of Applied Artificial intelligence society at the

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University of Bradford United kingdom. He has broad experience in data science, machine learning, and Artificial intelligence. His current research interest is on Federated analytic, Block chain technology, and Natural language processing.

Sebastian is a Certified NLP Engineer, Certified Data Scientist, and Skilled in Data Warehousing, SQL, Power BI, Excel, and Python. Strong knowledge of Machine Learning, Artificial Intelligent, and Data Mining, with a Distinction in MSc Data Science and Machine Learning.

He is a hands-on Data analyst, actively participating in global data science projects on Kaggle.com and Zindi Africa.

He is a graduate of London South Bank University in Data Science, Bradford University in Applied Artificial Intelligence and Data Analytics and has also had both part-time and executive education in many other leading institutions, including the Institute of Business Management in Berlin Germany.
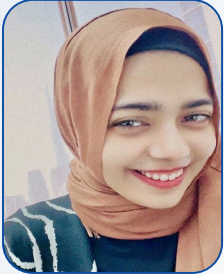
### Machine Learning Approaches to Classify Malware Data

## Sabah Iqbal, Shiemaa Adlan

*Security Analyst at Pure Health group*

## Abstract

With the recent increase in the use of the Internet, there has been a rise in Malware attacks. Malware attacks can lead to stealing confidential data or make the target a source of further attacks. The detection of Malware has been posing a unique challenge. Malware analysis is the study of malicious code to prevent attacks.It is also helps with vulnerability assessment. This article aims for classification of malware using a deep learning model to obtain an accurate and efficient performance. Our system extracts a number of features and trains the Long Short-Term Memory (LSTM) model. The study utilises hyper- parameter tuning which to improve the accuracy and efficiency of the model. The findings revealed 99.65% accuracy using sigmoid function that outperforms other activation function. This can be helpful in malware detection.

## Biography

Saba Iqbal is a Security Analyst at Pure Health group, Speaker at the 15th International Conference on Information Technology and Applications (ICITA 2021) conference. She earned her Master's of science in Network Security and Bachelors in Electrical & Electronics. She is the of author a peer-reviewed publication in the area of data science and network security at Springer.

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## Simple scalable benchmarks for realized covariance forecasts

## Adam Clements[1] and Andrey Vasnev[2]

*[1]Queensland University of Technology, Queensland, Australia*
*[2]University of Sydney, New South Wales, Australia*

## Abstract

The Heterogeneous Autoregressive (HAR) model of Corsi (2009) has become the benchmark model for predicting realized volatility, given its simplicity and consistent empirical performance. With the widespread availability of high-frequency data, the recent literature has focused on employing realized (variance)-covariance matrix (RCOV) to build forecasting models. As the dimension of the set of assets in question increases, the number of coefficients also increases. While restricted models are popular, which avoid the worst effects of parameter proliferation, the regression problem grows in size as more assets are included.

We propose a moving averaging benchmark for the RCOV matrix based on the HAR structure and equal weights known to perform well in many forecasting contexts. This avoids parameter estimation required in full models and provides two significant benefits. First, it is a scalable approach in that it avoids the issues of parameter proliferation. Second, with no parameter estimation, this approach also avoids the need for non-linear transformations to mitigate the effect of spikes/outliers, heteroscedasticity and structural breaks in the time series of the elements in the RCOV matrix. We show that this approach performs well relative to the recent successful benchmarks.

## Biography

Andrey Vasnev is the Head of the Discipline of Business Analytics at the University of Sydney Business School. He graduated in Applied Mathematics from Moscow State University in 1998. In 2001 he completed his Master's degree in Economics at the New Economic School, Moscow. In 2006 he received a PhD degree in Economics from the Department of Econometrics and Operations Research at Tilburg University under the supervision of Jan R. Magnus. He worked as a credit risk analyst in ABN AMRO bank before joining the University of Sydney in 2008, where he currently works.
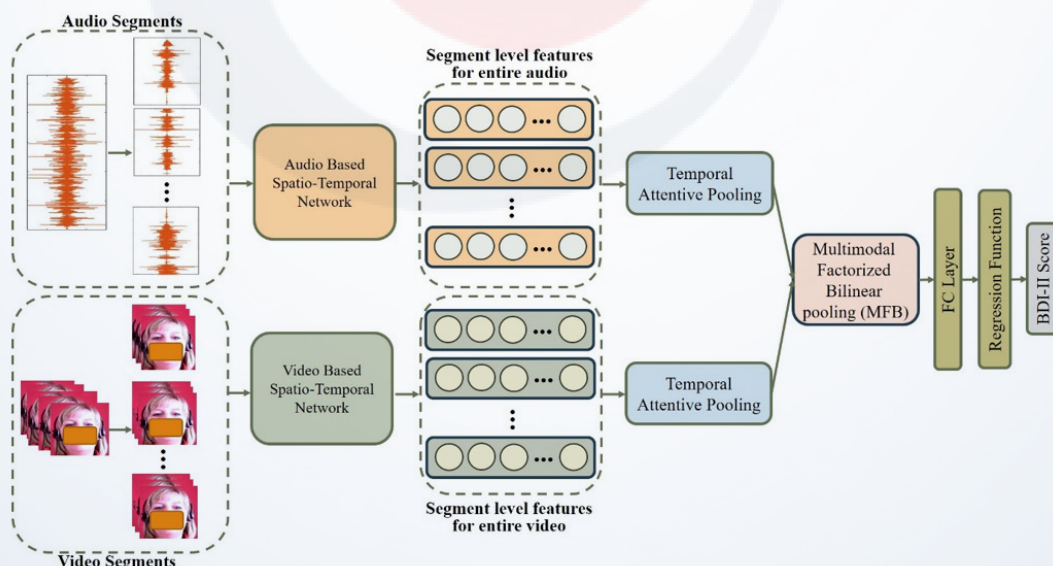
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## Deep Multi-Modal Network Based Automated Depression Severity Estimation

### Md Azher Uddin

*Heriot-Watt University Dubai, United Arab Emirates*

## Abstract

Depression is a severe mental illness that impairs a person's capacity to function normally in personal and professional life. The assessment of depression usually requires a comprehensive examination by an expert professional. However, this procedure is labor-intensive, lacks real-time measurements, and depends on subjective perception. Recently, machine learning-based automatic depression assessment has received considerable attention for a reliable and efficient depression diagnosis. Various techniques for automated depression detection were developed; however, certain concerns still need to be investigated. In this research, we introduce a novel deep multi-modal framework that effectively utilizes facial and verbal cues for an automated depression assessment. Specifically, we first partition the audio and video data into fixed-length segments. Then, these segments are fed into the Spatio-Temporal Networks as input, which captures both spatial and temporal features as well as assigns higher weights to the features that contribute most. In addition, Volume Local Directional Structural Pattern (VLDSP) based dynamic feature descriptor is introduced to extract the facial dynamics by encoding the structural aspects. Afterwards, we employ the Temporal Attentive Pooling (TAP) approach to summarize the segment-level features for audio and video data. Finally, the multi-modal factorized bilinear pooling (MFB) strategy is applied to fuse the multi-modal features effectively. An extensive experimental study reveals that the proposed method outperforms state-of-the-art approaches.

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## Biography

Md Azher Uddin received his B.Sc. degree in Computer Science and Engineering from International Islamic University Chittagong, Bangladesh in 2011 and the Masters leading to Ph.D. degree in Computer Science and Engineering from Kyung Hee University, South Korea, in August 2020. He is currently working as an Assistant Professor with the Department of Computer Science, Heriot-Watt University Dubai, United Arab Emirates. His research interests include Image Processing, Computer Vision, Machine Learning, Big Data analytics and Health-Care Data Analytics.

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## Australian housing prices: A big-data predictive model

### Dr. Rachida Ouysse

*University of New South Wales, Sydney Australia*

## Abstract

Movement's in house prices have a significant impact on household welfare, financial stability and business cycles. Producing accurate house price forecasts is therefore of importance for central banks, financial supervision authorities as well as other economic agents. However, forecasting house prices using a single or a few selected variables appears ine cient because movements in house prices may reflect many different sources of information. House prices, along with other financial indicators, move jointly with future economic activity and nation. The recent financial crisis, as well as its links with the housing market boom and bust in several countries around the world, have provided additional evidence that housing variables commove strongly with the business cycle.

This article examines the ability to forecast house prices using data-rich approaches. Many problems in economics require the exploitation of large panels of time series. Recent literature has shown the value of large information for signal extraction and forecasting and has proposed several methods to handle the large dimensionality problem. These methodologies can be classified into two broad classes: (1) Sparse modelling techniques which focus on selecting a small set of explanatory variables with the highest predictive power from a much larger pool of possible regressors. Techniques like the popular LASSO and its variants belong to this class of estimators that yield sparse representations of predictive models. (2) Dense modelling techniques on the opposite side of the spectrum recognize that all possible explanatory variables might be important for prediction, although the impact of some of them may be small.

## Biography

Rachida Ouysse completed her PhD in Economics with a specialization in Econometrics at Boston College in 2003. She holds a lecturer position at the Business School (Economics) at the University Of New South Wales (UNSW). Prior to joining UNSW, she held several teaching and research appointments at Boston College and University of Montreal. She has also been visiting academics at the Risk Management Institute in Singapore, Department of Economics in San Diego USA, and Department of Economics at University College Dublin, Ireland, European Center for Applied Research in Economics and Statistics (ECARES), the United Nations University (ONI-CRIS) in Belgium.

Ouysse's research training is on modelling, estimating and making correct statistical inference in big systems. Big-data presents technical challenges (hence curse of dimensionality) to the existing statistical tools that are used in economics and finance. Ouysse work falls in the new research that aims at turning the curse into a blessing. Ouysse's work has been published in top tier field journals. Her contribution to the theoretical developments in econometrics has direct empirical implications.

**"wearable devices to monitor energy expenditure and sleep quality: state of the art and a new possible tool"**

## Dr. Roberto Cannataro

*Registered Nutritionist, Milan, Lombardy, Italy*

## Abstract

The use of portable devices to evaluate, at least the energy expenditure, is experiencing a solid expansion in the last few years. As a result, various devices are on the market with relatively low costs (ranging from 100 to 300 $). However, in the face of these costs, the reliability of the devices is low; it should be emphasized that almost no one is offered in the medical field or has CE certifications. Therefore we propose to provide a reliable tool in scientific terms, which traces the one already on the market up to 6 years ago, namely the Sensewea Armand, but no more available. In addition, however, providing new features: the possibility of continuous tracking and even higher predictivity, thanks to the external temperature measurement and the use of new and more reliable sensors.

## Biography

He acts as a nutritionist in 12 different cities in Italy, he is a consultant for several sports federations.

He directs two master courses in nutrition and supplementation in sport and sports analytics at the University of Calabria.

He is a consultant for firms involved in nutritional supplementation, novel food, bioimpedance, performance evaluation, and stratigraphy.

He is CSO of Gala screen Laboratories (genomic, miRNA evaluation), Vita Vegan Food, BlowC (food premixed with low carb content):

He is a scientific committee member of SINSeB (Italian Society of Sort Nutrition and Wellbeing), LIO (Italian Lipedema Association), DBSS (Dynamical Business Science Society), and Hygeia (metabolic sensor), Sport & Salute (review on sports science).

He is a review board member of Sports, Nutrients, International Journal of Molecular Science, Diagnostics, Journal of Functional Morphology and Kinesiology, Frontiers in Physiology, Frontiers in Sports and Active Living, microRNA

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### COVID-19 Pandemic in the New Era of Big Data Analytics in egovernment: Applications and Challenges\ Future Research Directions

## Rasha Sadeq Abdin

*Researcher in AI and Big Data topics*

## Abstract for paper 1

Big data applications and data analytics play a vital role in proposing ultimate strategic decisions. Previous research work emphasized that big data applications and analytics can empower those who apply it. However, the sudden emergence of COVID19 has drastically changed the global economy, social life and both individuals and communities' health standards. It has raised challenges, set burdens on nations to progress and continue their sustainability and development. In this paper, a thorough research on literature review papers specializing in big data applications is conducted. A comparison between the before and after pandemic, use of big data applications in e-government is presented. The comparison is extended to three highly-recognized industry fields: Healthcare, Education, and Transportation. A discussion on the effectiveness, of the 4 major types of data analytics across the mentioned industries, is highlighted. Hence, this paper provides an illustrative description on the importance of big data applications in the era of COVID19, as well as aligning the applications to their relevant big data analytics models. We conclude that applying the ultimate big data applications and their associated data analytics models can harness major hurdles faced by organizations during one of the most fetal pandemics worldwide. Such applications supported organizations and nations to navigate through COVID19 pandemic confidently. The future work will start by investigating the Big data implementation challenges faced by e-governments on different levels, it will also investigate the critical success factors of Big Data and their categories toward developing a conceptual model for Big Data implementation.

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## Big Data Challenges during COVID-19 Pandemic for e-government: Reviews and Future Directions

## Abstract for paper 2

The sudden emergence of COVID19 has drastically changed the global economy, social life and both individuals and communities' health standards. It has raised challenges, set burdens on nations to progress and continue their sustainability and development. Hence, COVID19 pandemic, paralyzed most vital industries globally. Moreover, there is no evident of how ICT and e-government can support cross nations unifications. Recently, this is the presented fact, however there is a real opportunity hidden in the new oil, in the digital economy, which is Big Data. Despite the new opportunities from Big Data insights, the challenges and issues that arise should be handled efficiently before and during the Big Data projects. This paper will present in details challenges faced by governments. The challenges will be illustrated by regional challenges and challenges by 3 fields: Healthcare, Education, and Transportation. The paper describes a proposed model. The presented proposed model goal, is to build a strategy that will not only optimize the utilization of big data application use, but also to build a long term strategy, that will enable governments to boost knowledge sharing beyond COVID19 burdens, and to ensure achieving governments sustainable development goals. It has to be a strategy that would overcome the current challenges and seize opportunities. The findings of this paper could be used as a grounded reference with critical insights for the decision-makers to perform their Big Data strategies and decision.

## Biography

Data Scientist Specialist | Researcher in Big Data & AI | BSc. MIS | MBA | CAPM

Rasha Sadeq Abdin, has a varied academic and work experience ranging from data science, project management and research. She is an MBA holder from American University of Sharjah, she has received her bachelor degree in MIS from AUS. She has a solid project management experience, as she was part of the IT advisory division in KPMG. A passionate researcher in the field of AI and Big Data, who is looking for the AI research field in a distinctive way to solve regional and global challenges in AI and seize opportunities, keeping in mind the importance of triple helix model as an accelerator to the research work.

### Is Ensemble Learning emerging to be the new gold standard for classification problems

## Sriram Tigulla

*Head of Risk Analytics, Boubyan Bank, Kuwait*

## Abstract

Over the years, consumer banks have developed several novel products to boost their revenue, however lending continues to remain their single largest income stream. The biggest risk facing the lending business is the risk of default i.e., if the borrower willingly or unwillingly fails to fulfil the obligations of the loan. Thereby, these retail banks heavily rely upon credit scoring models to be able to make critical lending decisions in a time efficient manner, and constantly strive towards improving the performance of their reigning models.

To be able to anticipate if a potential borrower would default or not, is a classification problem. For several decades, albeit its limitations in addressing complex non-linear relationships, logistic regression has maintained its status as an industry gold standard to solve classification problems and continues its footing even today in credit scoring. The major cause to this effect is the organizational resistance to divert from already established industry standards and accept advanced ensembled machine learning algorithms. With ensemble methods usually engaging a large number of models, business leaders at consumer banks often perceive that wider expertise is essential to handle such classifiers and therefore refrain from adopting them.

Comparative benchmarking studies could be the solution, highlighting the business interests to a sufficient degree, in accepting a wider range of classification algorithms for credit scoring. The current discussion is a litmus test for ensemble learning methods, and is pivoted on a benchmark study comparing the predictive performance of logistic regression with advanced ensembled classifiers such as Random Forest and XGBoost, coupled with a strong business use case.
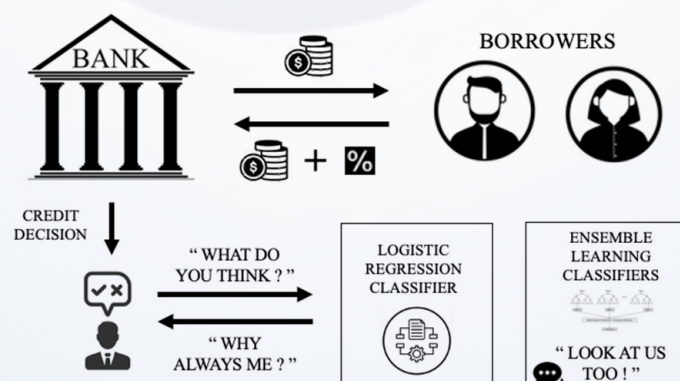
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## Biography

Sriram has close to a decade of risk management experience primarily in Banking & Financial Services sector, covering various dimensions of risk management landscape, with particular expertise in analytics and statistical modeling.

He is currently the Head of Risk Analytics in Risk Management Group at Boubyan Bank, wherein he manages all regulatory and internal analytical & modeling needs at a group level, in addition to retail portfolio risk management.

Before joining Boubyan, he worked with consulting firms – KPMG, Aptivaa and Ardent Advisory, wherein he assisted several top tier banks and Investment banks on various risk management engagements in US, India, Sri Lanka, Mauritius and extensively in the Middle East region.
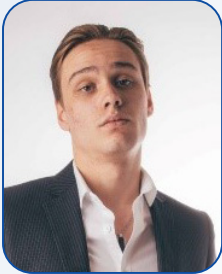
## "AI & Big Data vs. Workforce"

## Leonard Vuylsteke

*University of Cumbria, Dubai, UAE*

## Abstract

This talk will examine the case and the reality of automation of simple and mundane tasks and how it can quickly result into change of life - for better or worse. The question arises, are we trying to automate to many of our daily tasks for many whilst increase the barrier of entry for multitude of jobs in the future. We already see this phenomenon happening with McDonald's kiosks, movie theatres and soon to be self-driving cars.

Many of these jobs allowed for low skilled workers to bring food to the table. However, the more we automate these away, for higher skilled jobs such as coding ones. What do we then do with the surplus of labour? This idea has come up multiple times during other technical revolutions. However, the certainty of as many new jobs being created as uncertain.

The result will be that many will lose their jobs, in favour of very few coding ones that will arise. Even if there are more coding ones that arise, how will we reteach the surplus of labour a new skill in a short period of time.

To conclude AI & automation will be the greatest invention of the 21$^{st}$ century. The opportunity and ease of life will have skyrocketed. But the decision we need to make is how worth it will be for society.

## Biography

A young data enthusiast, Leonard has been obsessed with data and quantifiability for as long has can remember. Studying economics at university, and then finding a career in recruitment of analytics. His interest has always lied in people who have passion for numbers. Building his career in the recruitment field. He has learnt that even in relationship type of occupations. Data and numbers will always be involved. A true data evangelist. Even with his passions of data, analytics & AI. He is still worried that we might be going into deep territory that we don't fully understand yet.

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**Clustering in Feature-Rich Networks Using Data Recovery Approach**

## Dr. Soroosh Shalileh (PhD in Computer Science)

*Center for Language and Brain, HSE University, Myasnitskaya Ulitsa, 20, Moscow, 101000, Russia*

## Abstract

A feature-rich network is a network whose nodes are associated with categorical or quantitative features. This talk reviews our eight recently proposed cluster detection methods in feature-rich networks.

We categorize our methods based on: (A) (1) whether the features are used directly, or (2) they are converted to similarity; (B) (1) whether network/similarity data are comparable across the entire data table (summability mode), or (2) network/similarity data are comparable only within individual columns (nonsummability mode), and (C) (1) clusters are extracted sequentially, or (2) all clusters are extracted simultaneously.

Methods in category (C-1) are rather time-consuming, but they allow for automated derivation of the number of clusters. In contrast, methods of the category (C-2)[1] are fast analogue to the k-means clustering method to be run in the (B-2) mode [2]. The latter method, however, works in the joint node/feature space and, thus, may be subject to the so- called dimensionality curse; to tackle this, we apply, on par with, the squared Euclidean distance, the so-called Cosine distance.

We compare and evaluate our proposed methods' performance with the SOTA algorithms over 800 synthetic and eight real-world datasets. Our experiments with real-world and synthetic datasets show that these algorithms are valid and competitive.

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2.  Shalileh, S. and Mirkin, B., 2021. Least-squares community extraction in feature-rich networks using similarity data. Plos one, 16(7), p.e0254377.
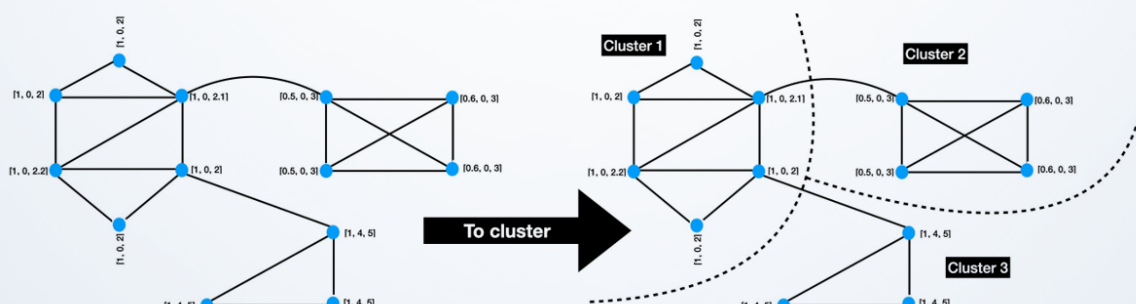
## Biography

Dr Soroosh Shalileh received his PhD. in Computer Science, from NRU HSE University, Moscow RF. Currently, he is working as an AI researcher and the head of the computation group in the center for language and brain NRU HSE University, Moscow RF.

## Machine Learning and Statistical Approaches to Assess Time Series Data in Profitability Analysis

### Shiemaa Adlan

*Data Scientist for Ergontec and as Web Admin and Analyst for UC in Dubai, UAE*

## Abstract

Customer-based firms are overwhelmed by the enormous availability of data. Nevertheless, the customer life cycle became an uncertainty factor due to the tremendous activities by competitors. In this context, observing customer lifetime value can reduce the losses associated with churn customers. The research aimed to observe the profitability sources to enhance decision making rather than trying to look for customer behaviours through a "foggy window". This research is believed to be the first empirical study of how the probabilistic models, which include Beta Geometric/Negative Binomial Distribution (BG/NBD), is superior to label time series transactional data in the retail industry. The data based on recency, frequency, monetary and lifetime of a given customer, are the crucial factors for the study of churn customers. The churn value is determined by the probability of being energetically active in the transactions. An investigative analysis is made using machine learning models (ML) .Despite the high-performance results, the data is suspected of having an imbalance problem. Hence, this is handled by Synthetic Minority Oversampling Technique. Subsequently, a comparative analysis of ML models results, is made before and after applying this technique. The high accuracy results in this research emphasized that time-series data were precisely labelled.

## Biography

Shiemaa Adlan is data scientist at Ergontec, Data Science (WiDS) Worldwide team Ambassador, Speaker at the 15th International Conference on Information Technology and Applications (ICITA 2021) conference Speaker and Event Organizer at Data Science Platform ,IEEE Brand Ambassador. She earned her Master's of science in data science and Bachelors in computer science. She has co-authored a peer-reviewed publication in the area of data science and network security at Springer. Her interdisciplinary background includes over 15 years of software development experience in possess strong IT skills including data bases, Machine Learning, Deep Learning, Data Visualization, Modelling, Statistics and Business Intelligence. Shiemaa develops tools and techniques that enable teams to make data-driven decisions, and applying these techniques to drive user growth. Scaling heights of success by leaving marks of excellence; targeting senior level assignments as a Data Scientist with an organization of high repute for mutual growth.

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### The Role of Data Analytics in Various Industries

## Sajjad Ahmed Tahir

*Smith+Nephew Dubai, United Arab Emirates*

## Abstract

Machines, social platforms, consumer transactions and digital apps have produced enormous amounts of data today's organizations would like to make good use of. Across industries, companies are already heavily data driven, developing roadmaps for data analytics to use for allocation of resources, improving performance and making smarter decisions. This paper explores the role of analytics in three prominent industries: banking, MedTech and automotive.

Within banking, although there are numerous analytical tools being used, the author has selected three dominant areas: fraud detection, credit risk modeling and customer segmentation. Detection of fraud, using machine learning helps banks to timely detect possible fraud of credit cards, loans, insurance and other banking products and services. Banks use customer profiles and transactional data to measure the risk associated with upcoming customer loans and financial relationships. Customer segmentation is used to define and plan marketing campaigns and operations based on customer spending, and other important behavioral parameters.

One of the distinctive segments within the MedTech industry belongs to robotics surgery. To assist surgeons in the operating room, navigation software uses predictive models to finalize and verify the size of the implant and the robot helps for a precise bone resection. Market analytics also helps MedTech companies estimate their market share and see if their company's performance is in line with the market. In addition, CRM analytics is used to create sales funnels of leads and prospective customers to quantify the revenue opportunities.

Automakers and their ecosystem partners use churn models, customer lifetime value modeling and performance dashboards to make informed decisions, up-sell/cross-sell throughout the customer's journey, track customer retention and performance of showrooms, sales reps, service centres and service advisors.

## Biography

Sajjad is an international data strategy leader with accomplishments in increasing market share by setting up innovative business intelligence and decision analytics. He designs and implement strategic projects to increase top line and bottom line growth. Sajjad's recommendations have helped companies achieve increased customer retention, enhanced operational efficiency and incremental revenue. He has a track record of accelerating business performance by promoting a culture of data-driven solutions, cross-functional collaboration, innovation and strategic communication. Using advanced analytics to identify problem areas and cross sell/up-sell opportunities. Holding pre-doctoral qualification in advanced statistical modeling and over 15 years of experience in creating segmentation, portfolio rationalization, pricing strategy, online dashboard design, marketing ROI measurement, risk management, post-merger business planning and predictive modeling for sales forecast and consumer behavior.

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## Implementation of an Optimization Routing model for Real Time Emergency Medical Service System

## C. Vijayalakshmi

*Department of Statistics and Applied Mathematics, Central University of Tamil Nadu
Thiruvarur, Tamil Nadu, India*

## Abstract

In today's traffic congestion reducing the travel time of an Emergency Vehicle (EV) is essential to increase the chance of casualty's survival.

This research mainly deals with the design of an Optimization Routing model for Emergency Medical Service System (EMSS). Optimization model for Emergency Medical Service System (EMSS) plays a major role towards society protection.

This examines the real time flexible dispatching strategy so that crucial response time can be saved for EMSS. In the Emergency Medical Service system, the response time plays a crucial role in minimizing adverse impacts. Fatalities and the loss of property can be greatly reduced by improving of the response time to incidents.

Real-time traffic and travel time data are available in EMSS dispatch center. This model helps to analyse developing flexible dispatching strategies with the help of duration information from home station. It can be envisioned that proper route diversion or reassignment will improve the performance greatly especially when there is significant traffic congestion or when severe incidents happen. Based on the numerical calculations and graphical representations it reveals to the fact that the different parameters are being analyzed such as duration prediction, incident/vehicles tracking, and consign optimization thereby it is validated for road networks.

## Biography

Dr. C. Vijayalakshmi is currently working as Associate Professor in the Department of Statistics and Applied Mathematics, Central University of Tamilnadu, Thiruvarur. She received her Doctorate of Philosophy in Stochastic Processes, General Bulk Queues and their applications from Manonmaniam Sundaranar Univeristy and M.Sc. Operations Research and computer Applications from National Institute of Technology, Trichy, India. She has 22 years of teaching experience and 2 years of Industrial experience. She has written 5 monographs for Engineering students. Her credential includes the publication of 4 patents, 125 International/National Scopus Indexed Journal publications, 80 International/National conference proceedings , 10 Best paper awards, 2 projects completed. Under her guidance 15 students have been awarded Ph.D. She has organized 15 conferences and 3 with CSIR funding. She has received best project award, Academic excellence award and research awards at various levels.

Effective Medical Data Curation for the Optimum Performance of Machine Learning and Deep Learning Models

## Chukwuebuka Joseph Ejiyi[1], Zhen Qin[1], Makuachukwu Bennedith Ejiyi[2]

[1]*School of Information and Sofware Engineering, University of Electronic Science and Technology of China*
[2]*Faculty of Pharmaceutical Sciences University of Nigeria Nsukka*

## Abstract

Although oftentimes not considered very crucial, effective preparation of data for implementation in Machine Learning and Deep Learning remains the fulcrum upon which the performance of the models is hinged. The procurement of data is the very first important step in every Artificial Intelligence project but in the medical field and in many other fields, the procurement of data is usually difficult. This is in some cases a result of some privacy and other related policies. Although with the availability of technology and smart devices lots of data is generated which tends to arrest the challenge of data procurement. With this machine-generated data, comes anomalies that may be attributed to the devices themselves or individuals, additionally, when the data is manually generated, the possibility of missing data and more is usually high. In the medical field, some patients may not be willing to give some information or may give the wrong ones thereby prompting the need for the curation of data. Several steps before curation are required which are not limited to the formulation of the problem and the proper data collection itself but may include data exploration and many more. In the task of curation, the data is basically cleaned and validated using various tools which are geared towards making the data understandable by machines and also make for easier implementation for both Machine learning. For the purpose of predicting cardiovascular diseases for which we used Shapely and other data curation methods including data augmentation, the following improvements were recorded from the data 11.25%, 11.64%, 10%, and 10.46% respectively for accuracy, sensitivity, F1 score and precision using gradient boosting algorithm while the ANN gave 100% accuracy on a UCI heart disease dataset. This is an indication that the use of data curation goes a long way in improving the performance of both machine learning and deep learning models.

## Biography

Chukwuebuka Joseph Ejiyi received his Bachelor's Degree in 2014 from the Federal University of Technology Owerri (FUTO) Nigeria. He went on to obtain a master's degree in Software Engineering at the University of Electronic Science and Technology of China (UESTC) in 2021 where he majored in deep neural networks. He is currently pursuing a Ph.D. degree with the School of Information and Software Engineering at UESTC Chengdu China. His research interest is in Artificial intelligence, Deep Learning and he is interested in Object detection using a single-stage neural network as well as image classification/segmentation and is currently working on image/data analysis, especially with regard to the medical field.

### Bayesian Dynamic Stochastic General Equilibrium Models

## Ana León-Gómez

*University of Málaga, Spain*

## Abstract

The purpose of this study is to solve the measurement and estimation problems of Dynamic Stochastic General Equilibrium (DSGE) macroeconomic models applied to the tourism. Nowadays, there is a need to establish a procedure for measuring the level of tourism impact on economic growth (Liu & Wu, 2019). To this end, previous studies have used DSGE models (Zhang & Yang, 2018), often developed by Monte Carlo method (Farkas & Tatar, 2020), which generates multiple data problems (Ditzen & Gundlach, 2016). We evaluate the estimation of economic growth regressions of the Solow model based on the Stochastic Simulation Algorithm formulated according to the Next Reaction method. Our results improve the accuracy levels of the DSGE models applied to the tourism as they achieve faster convergence of the coefficients of the variables, thus reducing possible measurement errors and the level of deviations. Our findings have important practical and social implications for the economic contribution of tourism. The improved accuracy of the DSGE model developed allows for optimal decision making. This study contributes to the literature on DSGE models by providing more robust results that allow predictions to be made with a lower level of error and bias, which is of vital importance for public institutions and other stakeholders in macroeconomic and tourism analysis.

**References:**

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2. Farkas, M. & Tatar, B. (2020). Bayesian estimation of DSGE models with Hamiltonian Monte Carlo (No. 144). IMFS Working Paper Series. http://hdl.handle.net/10419/223402

3. Liu, A. & Wu, D. C. (2019). Tourism productivity and economic growth. Annals of Tourism Research, 76, 253–265. https://doi.org/10.1016/j.annals.2019.04.005

4. Zhang, H. & Yang, Y. (2018). Prescribing for the tourism-induced Dutch disease: A DSGE analysis of subsidy policies. Tourism Economics, 25(6), 942–963. https://doi.org/10.1177/1354816618813046

### Human Capital Growth Analytics

## Aboli Khairnar

*Citi Ventures, United States*

## Abstract

The majority of traditional corporate valuation methods are solely based on tangible indicators – sales growth, gross profit, cash flow, and operational performance – which are the result and don't reflect the underlying process which makes the organization successful in the longer run. One of the most important intangible assets that don't appear directly on the balance sheet is human capital. In this research, we focus on the role that workforce skills, education, and knowledge play towards organizational success using state-of-the-art Machine Learning techniques. We find that investments in human capital not only play a crucial role in organizational growth but also have a causal relationship.

## Biography

Aboli is an Associate Data Scientist on the Venture Innovation's Studio team, where she helps leverage the power of data science and machine learning to maximize their impact. She is passionate about using data for social good. She was previously a part of the CUPID program, where she worked as a Data Scientist Intern for Studio.

Before joining the Studio team Aboli worked at Stantec, where she served as a Data Analyst analyzing and predicting flood frequency risk for rural catchments. She graduated with a master's degree in Applied Economics from the University of San Francisco and holds another master's degree in Water Resources Engineering from the Indian Institute of Technology Bombay.

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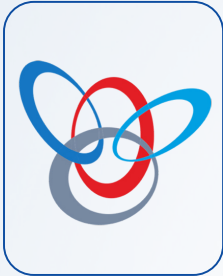## Acquisition of Genitive Case by Bilingual Guilaki-Persian English Learners

## Ali Akbar Jabbari

*Yazd University, Iran, Islamic Republic of*

## Abstract

The present study focuses on recognition and production of the English genitive cases with similar structure in a Persian language of the north of Iran, Guilaki (i.e., possessive determiners and possessive relations) or Persian (i.e., non-possessive relations) at initial state of English as Foreign Language third language (EFL) acquisition. In this regard, the researcher selected the most proficient Guilaki and Persian speakers-beginner EFL learners who were comparably aware of the structures under study to establish L3 and L2 groups. Both groups equally comprised 30 female third-grade junior high school English learners. The statistical analyses on Grammaticality Judgement Test (GJT) and Translation tests of the L3 group suggested different levels of cross-linguistic influence, and hence partially supporting Full Transfer/ Full Access (FT/FA) hypothesis, L2 transfer hypothesis or Cumulative Enhancement Model (CEM) for each form of genitive case. Moreover, the findings indicated a possible association between the L3 group's poor performance and their incomplete Guilaki (L1) acquisition due to the intense contact with the majority language (i.e., Persian as L2). Consequently, EFL teaching through learners' language background can improve their English and preserve their background languages.

Keywords: Natural Bilingual, Genitive Cases, Majority Language, Persian, Guilaki & English languages

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## A Song Recommendation System Using Sentiment Analysis Based on User Reviews

### Andrew Kim

[1]*Cresskill High School*

## Abstract

Sentiment analysis and recommendation systems are among the most active areas of research in machine learning. Sentiment analysis focuses on using natural language processing and text mining techniques to evaluate the sentiment (i.e. positive, negative, neutral) of an unstructured text such as a tweet, comment, or product review. Recommendation systems use a variety of data science techniques to generate personalized content recommendations for the users. Here, we present a Python-based prototype for recommending songs to the users based on the sentiment of their reviews. We used the Amazon reviews and the Spotify music datasets from Kaggle for development purposes.

## Biography

Andrew Kim is a senior at Cresskill High School in New Jersey. He is interested in computer and data science.

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## Deep Neural Networks based Multiclass Animal Detection and Classification in Drone Imagery

## Changrong Chen[1], Thani Jintasuttisak, Andrew Leonce, Gregory Simkins[2], Tamer, Umar Yahya[3], E.A. Edirisinghe[1]

*Loughborough University, Loughborough, UK*

## Abstract

Fauna in deserts regions is increasingly threatened by urbanization and other infrastructural developments. There is thus growing interest among the research community in the search for possible technology-driven strategies for the conservation of desert life. In this work, we investigate the use of one of the best available Deep Neural Networks, YOLO Version-5 (v5), to enable offline detection, identification and classification of three popular desert animals (i.e Camels, Oryxes, and Gazelles). The experimental dataset contains over 1200 images, which were partitioned into training, validation, and testing data sub-sets in a 8:1:1 ratio, respectively. The ultimate goal is to use the otcomes of the proposed research to enable real-time online identification and classification of these animals' activities as captured by UAVs. We trained three Multi-class models, animal classification models, based on YOLO v5 Small(S), Medium(M) and Large(L) representing increasingly deep and complex architectures, to simultaneously detect and label the 3 kinds of animals. Models' performance was compared on the basis of classification accuracy (F1-Measure). The Multi-class detector models generated were also compared with the single animal detector models created using the same network architectures. YOLO v5 L achieved the highest multi-class average classification accuracy of 96.71% (95.39 – 98.98). In comparison with the single animal detector models, the Multi-class models exhibited the ability to correctly detect the target objects even for cases where the objects are located close to each other. We provide comprehensive test results and an analysis of results to demonstrate the effectiveness of the proposed models.

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## Biography

Changrong Chen received his B.S. degree in software engineering from Northeastern University, Shenyang, China in 2019 and his M.Sc. degree in Computer Science from Loughborough University, UK, in 2020. He is currently working towards his Ph.D. degree in Computer Science, under the supervision of Prof Eran Edirisinghe, Keele University, UK. His research interests include deep learning, machine learning, and computer vision. In particular he is working on using Deep Neural Networks to effectively detect, recognise, count and track objects in drone captured images and camera-trap images in desert areas.

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## Ghaf Tree Detection from Unmanned Aerial Vehicles Imagery Using YOLO-V5

# Guoxu Wang[1], Gregory Simkins[2], Umar Yahya[3], E.A. Edirisinghe[1]

*[1]School of Science, Department of Computer Science, Loughborough University, United Kingdom, LE11 3TU*
*[2]Dubai Desert Conservation Reserve, Dubai, United Arab Emirates*
*[3]Motion Analysis Research Laboratory, Islamic University in Uganda, P.O Box 7689, Kampala, Uganda*

## Abstract

In the UAE, the Ghaf is a national tree, regarded as a symbol of stability and peace due to its historical and cultural importance. Due to increased urbanization and infrastructure development in the UAE, the Ghaf tree is currently considered an endangered tree requiring protection. Utilization of aerial surveillance technologies in combination with Artificial Intelligence (AI) can particularly be useful in keeping count of the Ghaf trees in a particular area, as well as continuously monitor their health status thereby aiding in their preservation. In this paper, we utilize one of the best Convolutional Neural Networks (CNN) based object detection methods, YOLO-V5, to effectively detect the Ghaf tree in images taken by onboard cameras on unmanned aircraft vehicles (UAV) in some areas of the UAE. We utilize a dataset of over 3200 images partitioned into the training (60%), validation (20%), and testing (20%) dataset subsets. Four versions of YOLO-V5 CNN are trained using the training dataset subset. The validation dataset subset was used to fine tune the trained models in order to realize the best Ghaf tree detection accuracy. The trained models are finally evaluated on the reserved test dataset subset not utilized during training. The results of Ghaf tree detection obtained by the different four versions of YOLO-V5 are compared quantitatively and qualitatively. YOLO-V5m model produced the highest average detection accuracy of 96.33%. In addition, YOLO-V5m can detect and locate Ghaf trees of different sizes moreover in complex natural environments and in areas with sparse distributions of Ghaf trees.

## Biography

Guoxu Wang received a B.S. degree in digital media technology from Northeastern University, Shenyang, China, in 2018. He received an M.S. degree in Advanced Computer Science from Loughborough University, UK, in 2019. He is currently working toward a Ph.D. degree in computer science with the department of computer science, Loughborough University, UK. His research interests include deep learning, object detection, and computer vision.
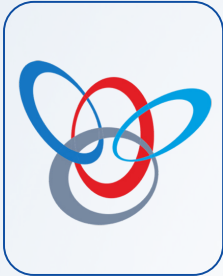
## Detrimental Effects COVID-19 Imposed on the Environment

## Gyuri (Leah) Kim

[1]*Bergen Technical High School, Teterboro, NJ, USA*

## Abstract

This paper turns to the Key Performance Indicators (KPIs) that pertains to the information of the world's city leaders' approaches to environmental sustainability pre- and the first year of the pandemic. In total, the aggregate score of KPIs across the two years are observed. First, the results from the t-test show a positive and significant increase in KPIs after the start of the pandemic (t(682), p-value = .001). Second, the relationship between KPIs and macro-level characteristics are captured. It can be concluded that KPIs are positively and significant determinants of the GDP per capita. Finally, one prominent finding is that a higher GDP per capita is associated with lower temperatures, whereas lower population size relates to greater KPIs.

## Biography

Gyuri (Leah) Kim is a senior at Bergen Technical High School in New Jersey, USA. She is interested in pursuing a career in environmental studies and finding creative, long-term solutions for climate change.

## Investigating Risk Assessment in Post Pandemic Household Cryptocurrency Investments: An Explainable Machine Learning Approach

## Lin Li[1,2]

[1] *KFUPM Business School, King Fahd University of Petroleum and Minerals, Dhahran, Saudi Arabia*
[2]*IRC for Finance and Digital Economy, King Fahd University of Petroleum & Minerals, Dhahran, Saudi Arabia*

## Abstract

This study provides an applicable methodological approach applying Artificial Intelligence (AI)-based supervised Machine Learning (ML) algorithms in risk assessment of post pandemic household cryptocurrency investments, identifies the best performed ML algorithm, and the most important risk assessment determinants. The empirical findings from analyzing 13 determinants from 1,000 dataset collected from major cryptocurrency communities online suggest that the Logistic Regression (LR) algorithm outperforms the remain six ML algorithms (i.e., Discriminant Analysis (DA), K-nearest Neighbor (k-NN), Classification Tree (CT), Random Forest (RF), and Bootstrap Aggregating Ensembles (BAE), and Neural Network (NN)) by using performance metrics, Lift chart, and ROC chart. Moreover, to make the ML algorithm results explainable and tackle the "black box" issue, the top five most important determinants are discovered, which are the interaction between investment amount and investment duration, investment amount, perception of traditional investments, cryptocurrency literacy, and perception of cryptocurrency volatility. This study contributes to the newly emerged body of knowledge on post pandemic household cryptocurrency investment risk assessment and behavior analysis, as well as provide implications for household cryptocurrency investors to make better investment decisions, and for financial regulators and investment managers to reduce cryptocurrency market distortion and effectively conduct risk controls during extreme situations, such as pandemics.

## Biography

Lin Li (lin.li@kfupm.edu.sa) is an assistant professor in KFUPM Business School, King Fahd University of Petroleum and Minerals. Her research interests include platform for online marketplaces, artificial intelligence, business analytics, information privacy, and e-business strategies. Her research has been published in The Service Industries Journal, Information Processing & Management, International Journal of Hospitality Management, Electronic Markets, Information Technology for Development, and many other journals.

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## Data Analyics Potential for Telco Service Providers as a Source of Revenue

### Mones Altarazi

*Master Degree in Business Analytics and Big Data from IE Business School - Waseela for Technologhy Consultations*

## Abstract

For the last decade, the telco service providers revenues have been decaying due to the finding new source of income rather than charging the consumers within the normal voice and data rates. Average revenue per user (ARPU) has been degrading compared to the increase in customer acqusition cost while maintaining the customer experience high is a a costly challenge. Therefore, service providers are keen to find new sources of revenues that enhance their profitability rather than the current B2C model, many of them are redirecting their strategies to the enterprise customers to monietize its infrastructure in a new kind of B2B model.

With the adoption of 5G, IoT, cloud hosting infrastructure, Big Data and Analytics application's, the service providers now are closer to generate further enhancment into their P&L's through monetiazing the existing data they own. They are considered as one of the most entities who own several kinds of data which might be used in a GDPR compliant approach to address different business needs by the enterprise clients.

Its fragmented, isolated and located in silo's, however with the emergent technologies of data engineering and data science tools they will be able to process large volume of data to satisfy different industries and client needs that are never been before, which will be reflected at the end to a new commercial business channels

## Biography

More than 13 years of experience in the field of ICT and digital transformation. Graduate in the field of Business Analytics and Big Data from IE Business school in Madrid, worked in different countries along the GCC and Mena region, served wide spectrum of customers base focusing on digital tgransformation and big data adoption for our clients.

The roles I handled are all about the solutions sales and business development, with keen exposure for different emergent technologies such as Big Data and Analytics, indoor navigation systems, IoT, 5G and UMTS network, Clouding, Smart City applications, , NB-IOT, and Connectivity networks.

## Future Stock Price movement in response to US Dollar exchange rate using Machine Learning Techniques

## Muhammad Atif Saeed

*FAST National University of Computer and Emerging Sciences, Islamabad, Pakistan*

## Abstract

A stock market is a place where shares of public limited companies are traded. The stock exchange allows the end-user to buy and sell the shares and other security/financial instruments. Previously, different mathematical techniques are used to predict the movements in the stock markets or shares based on different market factor i.e. demographic factors, country's financial position, political factors. The purpose of the research is to find the relationship or impact of the US Dollar fluctuation on the stock price movement. For the analysis purpose use two different dataset, first, movement in the USD as independent data member and fluctuation in stock price as a dependent data member. For this research, deploy different machine learning analytical tools to analyze the prices and predict the near future price or fluctuation of the prices based on different factors of the market.

In the last decade, Machine Learning (ML) is one of the powerful analytical and prediction tools which is used to predict the stock price movement. Researchers are widely used different prediction or classification machine learning techniques for the analysis of financial data to predict stock prices and this will help the investors to make better decisions about the investment, where to invest, and how much they have to invest. This decision will help them to take better financial advantage or profit from their investment decision.

### Biography

My name is Muhammad Atif Saeed student of Master Degree in Data Science from a reputable university of Pakistan named National University of Computer and Emerging Sciences. I have also qualified my Master degree in Information Technology as well as Cost and Management Accountant. So I have a vast experience of Machine Learning, Deep Learning as well as Stock Market. So thats why I want to work on the combination of these two fields. So I am going to predict Stock Market and the Impact of US Dollar exchange rate on the Pakistan Stock Market Index and prices of the stocks.

## Artificial intelligence in human in vitro fertilization

### Nozha Chakroun-Feki

*Laboratory of Histology & Embryology, Medical School of Sfax, Sfax, Tunisia.*

## Abstract

Infertility rates and the number of couples seeking fertility care have increased worldwide over the past few decades. Over 2.5 million cycles of assisted reproductive technologies are being performed globally every year, but the success rate has remained low. Machine learning, an automated method of data analysis based on patterns and inference, is increasingly being deployed within the health-care sector to improve diagnostics and therapeutics. This technique is already aiding embryo selection in some fertility clinics and research laboratories to improve IVF outcomes. It aims to choose the "best" embryos from the larger cohort of fertilized oocytes, the majority of which will be determined to be not viable either as a result of abnormal development or due to chromosomal imbalances. Enhancing embryo evaluation and selection, as well as increasing live birth rates, will require the adoption of novel technologies. As AI has the capability to analyze "big" data, the ultimate goal will be to apply AI tools to the analysis of all embryological, clinical, and genetic data in an effort to provide patient-tailored treatments. We report here an overview of existing AI technologies in reproductive medicine and envision their potential future applications in the field.

Keywords: Artificial intelligence; embryo selection; machine learning

## Predicting the Scalar Coupling Constants Between Atom Pairs in a Molecule Through Machine Learning Applications

### [1]Sean Kim

[1]*Fort Lee High School, New Jersey, USA*

## Abstract

In this paper, we used data on various molecular characteristics from the CHAMPS Kaggle competition (CHAMPS, 2019) to build a prediction model based on various machine learning approaches. We built models on the training set (N = 4,659,076 observations) and then used the best performing one to obtain and evaluate predictions on the testing set (N = 2,505,190 observations). We evaluated the performance of three models – linear regression, XGBoost, and Neural Net – on three metrics: R-squared, MAE, and RMSE. The XGBoost model resulted in a superior fit over Neural Nets and linear regression, with RMSE as lower as 2.75 on the test dataset. This result suggests that XGBoost is a viable approach for predicting the scalar coupling constant.

## Biography

Sean is a senior at Fort Lee High School in New Jersey, USA. Sean is passionate about computer science and hopes to conduct more research in the field.

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## Artificial intelligence and machine learning in autonomous off-road vehicle mobility

**Sergey Vecherin, Aaron Meyer, Jacob Desmond, Orian Welling, Michael Parker**

*Engineer Research and Development Center Cold Regions Research and Engineering Laboratory, USA*

## Abstract

Developing autonomous systems for off-road vehicle mobility is a challenging task, which is in the focus of many researchers. In comparison with the on-road autonomy, the off-road autonomy has unique challenges, such as classification of the terrain, vehicle routing off a known road grid, and determining areas where a vehicle can and cannot go. Moreover, there are no guiding road markings, traffic lights, and signs that would help vehicle navigation. In this paper, we present a concept of merging artificial intelligence and machine learning with vehicles autonomous systems aiming at addressing this task. This forms a terrain-informed intelligent off-road vehicle autonomy system. First, terrain in front of a vehicle is classified using look-ahead sensor systems to determine what kind of surface the vehicle will be driving on. Two approaches are presented and compared for automatic terrain classification, with the emphsis on the snow terrain, which is notoriously difficult for vehicle navigation. The sensors can vary from optical to hyperspectral cameras and lidar systems installed on either the vehicle or an acompanying drone. The terrain classification is implemented by neural networks and by an original machine learning algorithm. Then, the terrain information is transferred to another artificial intelligence system that predicts critical values for vehicle speed, acceleration/deceleration, and steering. These critical values are supplied to the vehicle robotic operation system (RoS) to control vehicle throutle, speed, and steering. The paper presents results and conclusions to date in this on-going research.
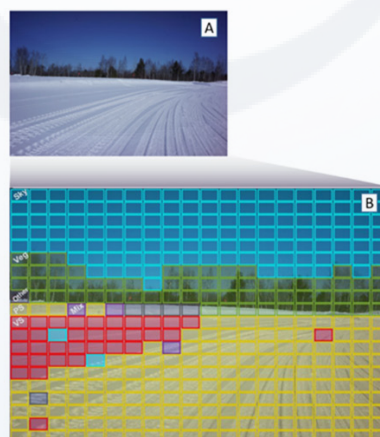
Figure 1. Automatic terrain classification. A: Snow scene as captured by a conventional camera. B: Classification of different features in photo A.

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## Biography

Dr. Sergey Vecherin has graduated with Honor from the Moscow State University (Russia) in 1998 with the MS degree in Physics. In 2007, he received a PhD in Physics from the New Mexico State University (USA), wich he graduated from with Summa Cum Laude. Since 2008 he is working as a Reseach Physicist at the Engineer Reserch and Development Center, Cold Regions Research and Engineering Laboratory (USA). His scientific interests include acoustic and seismic signals propagation, signal analysis, artificial intelligence and machine learning.

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## Development and validation of a model for predicting malignant events for rupture intracranial aneurysm: A retrospective cohort study and clinical decision curve analysis

## Shifei Cai[1]

*[1]Tianjin Medical University/ Tianjin Medical University General Hospital/ Department of Neurosurgery, Tianjin, China*

## Abstract

**Background:** Patients with aneurysms, especially those treated by craniotomy, have a high probability of a poor functional outcome, as the disease pathogenesis is multifactorial and remains implicitly understood.

**Objective:** We derived a new algorithm to predict malignant events in craniotomy for IAs and to help guide management in this patient population.

**Methods:** This was a retrospective study in which logistic regression analysis was performed to combine predictors and malignant events. In total, 394 patients were included as a development dataset. The established model was validated internally and externally. The main outcome was the risk of malignant events in craniotomy for IAs according to the GOS.

**Results:** Clinical malignant outcomes were observed in 24.9% and 23% of patients in the two cohorts. The development model had an internally validated AUC of 0.860 (95% CI: 0.8106-0.9087). The Brier score, calibration intercept and calibration slope were 0.108, 0.000 and 1.000, respectively. The ROC and calibration curves showed that the development model performed well in discrimination and calibration. In external validation, the AUC was 0.930 (95% CI: 0.8495-1), the Brier score was 0.095, the calibration intercept was -0.583, and the calibration slope was 1.376. DCA demonstrated that the evident net benefit was significant in both the derivation and validation datasets.

**Conclusions:** We developed an original nomogram based on prediction algorithms to support patient education, clinical practice, and future research. It can reliably estimate the outcome of adverse events in craniotomy for rupture intracranial aneurysms at hospital admission..

## Biography

Shifei Cai is now a graduate student of neuroscience in Tianjin medical University(TMU), and is working on the development and verification of clinical prediction models, and is studying the risk of aneurysm rupture based on cerebrovascular CTA imaging combine the CFD technique.

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## Broadband Negative Epsilon at Visible Spectrum with Ag@SiO$_2$ Core-Shell Nanoparticles/Polymer Composites Using Machine Learning Approach

# Zahra Lalegani, Mohammad Hossein Golbabaei, Seyyed Ali Seyyed Ebrahimi

*Advanced Magnetic Materials Research Center, School of Metallurgy and Materials, College of Engineering, University of Tehran, Tehran, 11155 4563, Iran*

## Abstract

In this study, the prediction of the composition and geometry of a polymer composite film containing Ag@SiO$_2$ core-shell nanoparticles (NPs) was investigated in order to achieve the property unavailable in nature of negative epsilon for optical applications. A machine learning approach was used for prediction, and this work was carried out in two sections: prediction of Stöber synthesis conditions of Ag@SiO$_2$ NPs to achieve the desired geometry of core-shell NPs; and prediction of optimal geometrical conditions for a polymer matrix composite film containing Ag@SiO$_2$ core-shell NPs, to achieve negative epsilon in the visible spectrum. In this regard, a dataset collected from various experimental studies containing some 450 samples was used, which covered synthesizing and composite fabrication parameters. An optimization procedure was implemented to find the best neural networks architecture to induce two models with high predictive performance. The built neural network could correctly predict the SiO$_2$ shell thickness with 0.997 accuracy, whereas 87% of the data were predicted with an absolute error lower than 1 nm. Also, the second resulting neural network could predict the epsilon-effective of composite film with 0.997 accuracy, whereas 98% of the predicted data have an absolute error lower than 0.5. The most important achievement of this study was the model's ability to predict the target values, which were not included in the experimental dataset used for training, which showed an excellent generalization ability. This study could be a general solution and the basis of future studies in predicting negative epsilon composites containing different core-shell NPs and will open the way for designing new materials.

## Biography

Dr. Lalegani, holder of a Ph.D. in materials engineering from the University of Tehran, is experienced in materials processing and characterization. In her prior research activities, she has studied the synthesis of nanomaterials using DoE. Now, she is working on optimization of materials properties using machine learning.

## On Deep Imposters method

### Renata Avros, Zeev Volkovich

*ORT Braude College, Department of Software Engineering, Karmiel, Israel*

## Abstract

This work considers a novel method applying a deep learning methodology for attribution literature creations resting upon short patterns. An assembly of classifiers is constructed by training a deep network on set imposters creation collections considered as sequences of short chunks like "tweets". The pointed network arranges the bathes of the test group into signals, making it possible to label them consistent with their writing style. The procedure aims to new attitudes in investigating textual material applied to recognize authorship attributes of medieval Arabic documents. The provided numerical experiments demonstrate the high reliability of the method applied to the authorship problems of William Shakespeare and Al-Ghazali. The proposed methodology suggests a new look at the perusal of medieval documents' inner structures and possible authorship from the short-patterning and signals processing perspectives.

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## The Effectiveness of Knowledge Graph and Community Aware Sentiments on Stock Price Prediction with the help of Reinforcement Learning

## Abstract

Price prediction of any investment tool has been an important topic for investors, researchers, and analysts. Because it is affected by so many factors, forecasting the value of it is a difficult task to handle. In this work, a novel method based on deep reinforcement learning methodology is introduced for the price prediction of stocks employing sentiments of community and knowledge graph. As a first, a social knowledge graph of users is constructed by analyzing relations between connections. After that, time series analysis of related stock and sentiment analysis is blended with deep reinforcement methodology. Turkish version of Bidirectional Encoder Representations from Transformers (BerTurk) is utilized to analyze the sentiments of the users while deep Q-learning methodology is used for the deep reinforcement learning side of the proposed model to construct the deep Q network. In order to indicate the efficieny of the model, Garanti Bank (GARAN), Akbank (AKBNK), Turkiye Is Bankasi (ISCTR) stocks in Istanbul Stock Exchange are employed as a case study. Experiment results demonstrate that the proposed novel model achieves remarkable results for stock market prediction task.

## Biography

Zeynep Hilal Kilimci graduated from the Department of Computer Engineering, Doğuş University, in 2008, the M.Sc degree from the Department of Computer Engineering, Doğuş University, in 2013, and the Ph.D. degree from the Department of Computer Engineering, Kocaeli University, in 2018. From 2009 to 2011, she worked as a Software Engineer in CRM Department and the Data Warehouse Department in Deniz Bank. In 2011, she started to work as a Research Assistant at the Department of Computer Engineering in Doğuş University, where she also worked as an Assistant Professor, between 2018 and 2020. She is currently working as an Assistant Professor in Kocaeli University. Her research fields include text mining/processing, data mining, speech processing, machine learning, ensemble learning, deep learning, reinforcement learning, and artificial intelligence. She serves as a scientific referee for more than 50 journals such as Nature, Knowledge-Based Systems, Expert Systems with Applications, Journal of Experimental & Theoretical Artificial Intelligence, Soft Computing, IEEE Transactions on Cybernetics, IEEE Access, IEEE Transactions on Knowledge and Data Engineering, IEEE Transactions on Neural Networks and Learning Systems, Computational Intelligence and Neuroscience, Journal of Intelligent & Fuzzy Systems, Artificial Intelligence in Medicine, Data Technologies and Applications, and so on. She chaired the 2021 IEEE International Conference on Innovations in Intelligent Systems and Applications conference. She attended many well-known conferences in her field as a keynote speaker. She also served as a guest editor for Concurrency and Computation: Practice and Experience, Computer Science and Information Systems, Expert Systems, and special issues of MDPI journals.

## AI and New Sociological Challenges

### Dr Sandro Serpa

*University of the Azores, Ponta Delgada, Portugal*

## Abstract

AI is here to stay in an increasingly digitized society. Based on this assumption, we aim to put forth several emerging sociological challenges that this reality resulting from the mobilization of AI potentially presents to Sociology as a form of scientific knowledge, focusing on the underlying methodological implications: new information that is now possible to obtain; new ways of collecting and analyzing information; the technical and ethical risks that result from this emerging reality.

## Biography

Prof. Dr Sandro Serpa is an Assistant Professor in the Department of Sociology of the Faculty of Social Sciences and Humanities of the University of the Azores since 2013. He has been a higher education faculty member since 2000. He received his PhD in Education, with the speciality in Sociology of Education in 2013. He has teaching experience in areas such as Sociology of Education, Introduction to Sociology, General Sociology, Sociology of Organisations, Psycho-sociology of Educational Organisations, among others. He carries out research in the fields of the Teaching Sociology; Sociology of Education; Sociology of Organisations; Organisational Culture; Scientific Communication, Digital Society; Digital Literacy and Society 5.0. He has more than 270 publications in international journals (more than 130), books (18) and other scientific outlets in Brazil, Canada, China, Germany, India, Kazakhstan, Netherlands, Pakistan, Poland, Portugal, Romania, Switzerland, Turkey, United Kingdom, United States of America.

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