2022 International Conference on Electronics, Control, Optimization and Computer Science (ICECOCS)

December 1st-2nd, 2022

AMIRS, USMBA-FEZ, UIT-KENITRA, Morocco

GENERAL CHAIRS

MY EL HASSAN CHARAF
ABDESSALAM AIT MADI
SALMA AZZOUZI

https://www.amirs.ma/icecocs2022/

Welcome Message

On behalf of the Organizing committee, we would like to extend a warm welcome to all the participants of the 2022 International Conference on Electronics, Control, Optimization and Computer Science (ICECOCS'22) held on December 1st -2nd, 2022 in FEZ.

This scientific event organized by the Moroccan Association of Innovation and Scientific Research (AMIRS) in collaboration with SIDI MOHAMED BEN ABDELLAH university (FEZ) and IBN Tofail university (KENITRA) has been expected to become one of the important conferences in Morocco in the area of control and optimization on the fields of Electronic and Computer Science. It will provide a remarkable opportunity for academic and industrial communities to address new challenges, share experiences and discuss future research directions. The technical program will include plenary and regular technical sessions.

More than 116 papers were submitted to ICECOCS'22. After a strict review process, the acceptance rate for presentation in this conference was around **40%.** A selected number of papers may be invited to submit extended versions of their papers for publication in the International Journals as this was the case of the last edition on the International Journal of Modelling, Identification and Control (IJMIC) and Statistics, Optimization & Information Computing Journal (SOIC) Indexed in: (Scopus (Elsevier), DBLP, …)

The ICECOCS'22 is honored this year to have the following distinguished keynotes speakers: **Pr. Abderrahim BENSLIMANE, (SIEEE)** Professor of Computer Sciences, Vice-Dean IR of the UFR STS CERI/LIA from the University of Avignon, **Pr. Hong ZHU,** Chair of Cloud Computing and Cybersecurity Research group in the School of Engineering, Computing and Mathematics from the Oxford Brookes University and **Pr. Muhammad YOUNAS** from School of Engineering, Computing and Mathematics - Oxford Brookes University that have been invited to deliver lectures on relevant issues of Electronics, Control, Optimization and Computer Science. Therefore, we would like to thank all of them for accepting our invitation and we are privileged to have had the opportunity to learn from and with them.

We would like to express our gratitude to our universities' officials for their efforts and unlimited collaboration. We would like to thank all members of different committees for their efforts before and during the conference and all members of Technical Program Committee for their hard work in providing reviews in timely manner. Special thanks also go to all authors for their valuable contributions since ICECOCS'22 would not be possible without their contributions.

We are also grateful to all our partners and sponsors, especially Sidi Mohamed Ben Abdellah University, the Ibn Tofail University, the IEEE Section Morocco, Foundation Hassan II for MRE, the CNRST center and the AMIRS association.

We hope you enjoy your time with us and we look forward to meeting you all in the next edition of the ICECOCS conference.

ICECOCS'22 Organizing Committee

CONFERENCE PROGRAM			
19H00 – 20H30	**WEDNESDAY NOVEMBER 30th, 2022: KEYNOTE SPEAKERS' RECEPTION**		
	THURSDAY DECEMBER 1st, 2022		
08H30-09H00	**RECEPTION OF THE PATTICIPANTS**		
	REGULAR SESSIONS		
09H00-10H30	Oral Session 1.1 **OPTIMIZATION** Session Chairs : Pr. BACHIR BENHALA Pr. SAID AQIL	Oral Session 1.2 **CONTROL** Session Chairs : Pr. ABDERRAHIM BENSLIMANE Pr. ABDELHADI RAIHANI	Oral Session 1.3 **INTELLIGENT SYSTEMS AND COMPUTER MODELING** Session Chairs : Pr. ALI CHOUKRI Pr. MOHAMED AMNAI
	OPENING CEREMONY		
10H30 – 11H00	• Pr. Driss ZEJLI, ENSA, Kenitra, Morocco. • Pr. Youssef FAKHRI, Faculty of Sciences, Kenitra - Morocco. • Pr. Adnane AZZOUZI, Faculty of Sciences Dhar El Mehraz, Fez - Morocco. • Pr. My El Hassan CHARAF, Faculty of Sciences, Kenitra - Morocco. • Pr. Abdessalam AIT MADI, ENSA, Kenitra - Morocco. • Pr. Salma AZZOUZI, Faculty of Sciences, Kenitra - Morocco.		
11H00-11H30	**COFFEE BREAK**		
	PLENARY SESSIONS		
11H30-12H15	Internet of Things: Monitoring and optimization challenges for Security issues. **Pr. Abderrahim BENSLIMANE, University of Avignon, France** Session Chairs : Pr. KHALIFA MANSOURI ; Pr. MOHAMED AMNAI		
12H15-13H00	Automated Exploratory Testing of Machine Learning Classifiers. **Pr. Hong ZHU, Oxford Brookes University, Oxford, UK.** Session Chairs : Pr. YOUSSEF FAKHRI ; Pr. Mohammed QBADOU		
13H00-14H00	**LUNCH BREAK**		
	REGULAR SESSIONS		
14H00-16H00	Oral Session 2.1 **ELECTRONICS** Session Chairs : Pr. MOHAMMED GUERBAOUI Pr. AHMED HANAFI	Oral Session 2.2 **COMPUTER SCIENCE** Session Chairs : Pr. MUHAMMAD YOUNAS Pr. SAID AQIL	Oral Session 2.3 **SUPPLY CHAIN MANAGEMENT AND NEW TECHNOLOGIES: CHALLENGES AND OPPORTUNITIES** Session Chairs : Pr. LAILA EL ABBADI Pr. SAMAH ELRHANIMI
16H00-16H30	**COFFEE BREAK**		
16H30-17H00	**REMISE DES TROPHEES**		

FRIDAY DECEMBER 2nd, 2022			
REGULAR SESSIONS			
09H00-11H00	**Oral Session 3.1** **RENEWABLE ENERGY** **Session Chairs :** **Pr. AZIZ DEROUICH** **Pr. ABDELAZIZ FRI**	**Oral Session 3.2** **COMPUTER SCIENCE** **Session Chairs :** **Pr. HONG ZHU** **Pr. KHALIFA MANSOURI**	**Oral Session 3.3** **CONTROL** **Session Chairs :** **Pr. AHMED HANAFI** **Pr. ABDELHADI RAIHANI**
PLENARY SESSION			
11H00-11H45	**NoSQL, Big Data and Transactions.** **Pr. Muhammad YOUNAS, Oxford Brookes University, Oxford, UK.** Session Chairs : Pr. Mohammed QBADOU ; Pr. Bachir BENHALA		
11H45-12H30	**COFFEE BREAK**		
12H30-13H00	**CLOSING CEREMONY**		

USMBA-FEZ, UIT-KENITRA, Morocco
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TOPIC 1: OPTIMIZATION

PARALLEL SESSION 1.1

Session Chairs BACHIR BENHALA; SAID AQIL		Date: **December 01st, 2022** **09h00- 10h30**
09:00 09:20	Brahim Ouacha; Hamid Bouyghf; Mohammed Nahid; Said Abenna; Lahcen Zougagh	A comparative analysis of metaheuristic techniques for improving PTE and PDL of a wireless power transfer system
09:20 09:40	Nejjarou Omar; Aqil Said; Lahby Mohamed	Constructive heuristics and mathematical formulation for solving the permutation flow shop scheduling problem with setup time
09:40 10:00	Asmae El Beqal; Bachir Benhala; Izeddine Zorkani	Optimal Design of Type 3 and Type 4 Linear Phase FIR Differentiators using the Genetic Algorithm
10:00 10:20	Abdellatif El Ouissari; Karim El Moutaouakil; Chellak Saliha; Hicham Baizri	Genetic algorithms for the optimal control of a continuous model of a Diabetic Population

TOPIC 2: CONTROL

PARALLEL SESSION 1.2

Session Chairs: ABDERRAHIM BENSLIMANE; ABDELHADI RAIHANI		Date: **01 December 2022** **09h00- 10h40**
09:00 **09:20**	Mohamed Maniana; Azzeddine Azim; Fouad Errchiqui; Abdelali Tajamouati	Heat transfer in a disk brake
09:20 **09:40**	Ablavi Ericka Armela Kaneho; Nabila Zrira; Patrick Bokonda Loola; Khadija Ouazzani-Touhami	A Survey on Existing Chatbots for Pregnant Women's Healthcare
09:40 **10:00**	Hayat Ait Dahmad; Hassan Ayad; Hajar Moussanif; Ali El Alaoui	Fuzzy Logic Controller for 4WD/4WS Autonomous Agricultural Robotic
10:00 **10:20**	Fatima Zahra Belhaj; Zakariae El Idrissi; Hassan El Fadil; Abdellah Lassioui; Khawla Gaouzi; Mohamed Koundi; Fouad Giri	Output-feedback control of interleaved Buck-Boost DC-DC power converter with continuous input current for fuel cell energy sources
10:20 **10:40**	Mohamed Benaly; Abdelkader Mezouari; Rachid El Gouri; Benbrahim Mohammed; Hlou Lamaari;	Hamiltonian mechanics and neural network technology for high stabilization of Quadrotor UAV on SE

PARALLEL SESSION 3.3

Session Chairs: AHMED HANAFI; ABDELHADI RAIHANI		Date: **02 December 2022** **09h00- 11h20**
09:00 **09:20**	Carlos Barron-Romero	The oLJ13_N13IC cluster is the global minimum cluster of Lennard Jones' potential for 13 particles
09:20 **09:40**	Omar Britel; Asmae Fitri; Adil Touimi Benjelloun; Mohammed Benzakour; Mohammed Mcharfi	The influence of internal acceptors in the D-A'-π-A structure of organic dyes on the photovoltaic performance of dye-sensitized solar cells
09:40 **10:00**	Khalil Ibrahim Hamzaoui; Mohammed Gabli; Laurent Peyrodie	Anticipation of falls from a structure for paraplegics by intelligent methods
10:00 **10:20**	Manal Izem, Mohamed Amnai	Bibliographic study on Blockchain
10:20 **10:40**	Widad Zerzzari; Lalla Amina Charaf; Salma Azzouzi; My El Hassan Charaf	A Methodology for Monitoring IOV Interoperability Testing
10:40 **11:00**	Salma Arabi; Mohamed Saad Bajjou; Anas Chafi; Mohammed El Hammoumi	The implementation of lean manufacturing tools in Morocco: a study on small and medium-sized enterprises (SMEs)
11:00 **11:20**	Mohamed Saad Bajjou; Salma Arabi; Anas Chafi; Mohamed Ramadany	Additive manufacturing technology: an eco-innovative solution for the Moroccan construction industry

TOPIC 3: COMPUTER SCIENCE

PARALLEL SESSION 2.2

Session Chairs MUHAMMAD YOUNAS; SAID AQIL		Date: **01 December 2022** **14h00- 16h00**
14:00 14:20	Imane Khalil; Adnane Addaim; Zouhair Guennoun	Sun Centroid Extraction Algorithm for Satellite based on Black Sun Effect
14:20 14:40	Khalid Salhi; El Miloud Jaara; Mohammed Talibi Alaoui	An Unsupervised Neuro-Morphological Approach for Satellite Image Segmentation
14:40 15:00	Mohamed Sellam; Abdellah Marhraoui Hsaini; Idriss Chana; Aziz Bouazi and Ahmed Roukhe	Two Parallel CNN Blocks for brain tumors classification
15:00 15:20	Abd Allah Aouragh; Mohamed Bahaj; Noreddine Gherabi	Comparative Study of Dimensionality Reduction Techniques and Machine Learning Algorithms for Alzheimer's Disease Classification and Prediction
15:20 15:40	Abdellah Abid; Younes qobbi; Abdelhamid Benazzi; Mariem Jarjar; Abdellatif Jarjar	Two enhanced Feistel steps for medical image encryption
15:40 16:00	Khalid Azzimani; Hayat Bihri; Asma Dahmi; Salma Azzouzi; My El Hassan Charaf	An Expert System Based Approach for Personalized Nutrition and Food Menu Planning

PARALLEL SESSION 3.2

Session Chairs HONG ZHU; KHALIFA MANSOURI		Date: **02 December 2022** **09h00- 11h00**
09:00 09:20	Khalid Oqaidi; Sarah Aouhassi; Khalifa Mansouri	A Comparison between Using Fuzzy Cognitive Mapping and Machine Learning to Predict Students' Performance in Higher Education
09:20 09:40	Ahmed Laftimi; Hind El Makhtoum; Raouya Aknin; Youssef Bentaleb	AI-based intelligent blockchain for the authentication of the metering system
09:40 10:00	Ansar Daghouri; Khalifa Mansouri	Ontological modeling for the evaluation of Information System Success
10:00 10:20	Asma Sbai; Abdelali Touil; Lamya Oukhouya	Diabetic retinopaty detection using a pretrained machine learning model
10:20 10:40	Youssef Farhan; Ait Madi Abdessalam	Real-time Dynamic Sign Recognition System using MediaPipe
10:40 11:00	Tajioue Mohammed Amine; Moutai Fatima Zahra; Azzouzi Salma; My El Hassan Charaf	Towards optimising Fog caching using Deep Reinforcement Learning

TOPIC 4: ELECTRONICS

PARALLEL SESSION 2.1

Session Chairs MOHAMMED GUERBAOUI; AHMED HANAFI		Date: **01 December 2022** **14h00- 16h00**
14:00 14:20	Sanae Habibi; Abdelhak Bendali; Abid-Reda El Wardi; Samia Zarrik; Mouad El Kobbi; Mohamed Habibi; Hadjoudja Abdelkader	Study and Design of a Front-End of A UHF RFID Tag in 0.18µm CMOS Technology
14:20 14:40	Mohamed Haidoury; Aziz El Fatimi; Hatim Jbari; Mohammed Rachidi	Modeling of Fuel Cell by using Proteus
14:40 15:00	Noureddine Chabini; Said Belkouch; Mohamed Najoui	An Algorithm for Gate Resizing to Reduce Power Dissipation in Combinational Digital Designs
15:00 15:20	Hatim Jbari; Rachid Askour; Badr Bououlid Idrissi	Energy Management of Battery/Supercapacitor Electric Vehicle Considering Regenerative Braking Control
15:20 15:40	Chaimae Dada; Hafsa Hamidane; Mohammed Guerbaoui; Abdelali Ed-Dahhak; Abdeslam Lachhab	Identification of greenhouse temperature system using times series based on NARX model
15:40 16:00	Dior Masrané Reoukadji; Patrick Loola Bokonda; Imam Alihamidi; Moussa Sidibé; Abdessalam Ait Madi	Smart Medical Devices to Help Patients and Health Workers: A Survey

TOPIC 5: RENEWABLE ENERGY

PARALLEL SESSION 3.1

Session Chairs AZIZ DEROUICH ; ABDELAZIZ FRI		Date: **02 December 2022** **09h00- 11h00**
09:00 09:20	Mbarek Chahboun; Hicham Hihi	A Comparative study between direct and indirect power control of DFIG within wind power system by the stator flux orientation technique
09:20 09:40	Abdelfattah El Azzab; Rachid Lajouad; Abdelmounime El Magri; Aziz Watil; Ilyass El Myasse; Hassan Ouabi	A Green Innovative Sports Bike Based on an Induction Generator with a Nonlinear Controller
09:40 10:00	Rachida Elmousaid; Younes Adnani; Achour El Hamdaouy; Rachid Elgouri	Daily solar radiation prediction using NARX and MLP-NNs networks : A Case study of Kenitra City , Morocco.
10:00 10:20	Karim El Mezdi; Abdelmounime El Magri; Lhoucine Bahatti; Rachid Lajouad; Aziz Watil	Nonlinear control design and stability analysis of grid-connected photovoltaic system through LC filter with ANN based MPPT method
10:20 10:40	Saliha Sebbane; Nabil El Akchioui	ANN Training using Fireworks Algorithm and its Variants for PV Array Fault Classification
10:40 11:00	Youssef Moumani; Abdeslam Jabal Laafou; Abdessalam Ait Madi	Backstepping and ADRC control performances applied to Wind Turbine

SPECIAL SESSION 1: INTELLIGENT SYSTEMS AND COMPUTER MODELING

PARALLEL SESSION 1.3

Session Chairs ALI CHOUKRI ; MOHAMED AMNAI		Date: **01 December 2022** **09h00- 10h30**
09:00 09:20	Merieme El Abassi; Mohamed Amnai, Ali Choukri; Youssef Fakhri; Noreddine Gherabi	Schema Matching Based On Deep Learning Using LSTM Model
09:20 09:40	Amina Ouatiq; Sophia Faris; Khalifa Mansouri; Mohammed Qbadou	Towards the Use of teacher-chosen features to predict students' performance
09:40 10:00	Bahaa Eddine Elbaghazaoui; Mohamed Amnai; Youssef Fakhri; Ali Choukri; Noreddine Gherabi	Human profiling based on computer vision : : A survey with application
10:00 10:20	Ridani Mohamed; Mohamed Amnai	Optimization challenge in decision supporting systems: An overview

SPECIAL SESSION 2: SUPPLY CHAIN MANAGEMENT AND NEW TECHNOLOGIES: CHALLENGES AND OPPORTUNITIES

PARALLEL SESSION 2.3

Session Chairs LAILA EL ABBADI; SAMAH ELRHANIMI		Date: **01 December 2022** **14h00- 16h00**
14:00 14:20	Sara Amar	The challenges of supply chain digitalization: understanding the emotional factors in technology adoption and implementation
14:20 14:40	El Ghilali Maha; El Korchi Akram	Adoption of Digital Technologies for Sustainable Supply Chain: a systematic literature review
14:40 15:00	Hamza Sahil ; Zakaria Mighouar ; Jihane Melloui ; Naoual Belouaggadia; Laidi Zahiri	Covid's pandemic impacts on the supply chain: Challenges and opportunities
15:00 15:20	Meryem Boutbagha; Laila El Abbadi	Production Leveling or Heijunka: A Bibliometric Study
15:20 15:40	Nabil Roussafi; Samah Elrhanimi; Laila El Abbadi	In framework of logistics 4.0: improvement forecasting proposal
15:40 16:00	Bilal Karroumi; Abdelfettah Sedqui	Frugal innovation: Recommendations for the generalization of the concept in Moroccan industry

KEYNOTE SPEAKERS

Abderrahim BENSLIMANE, SIEEE
Professor of Computer Sciences, Vice-Dean IR of the UFR STS CERI/LIA University of Avignon
339 Chemin des Meinajaries BP 1228 - 84911 AVIGNON CEDEX 9

Abderrahim Benslimane is Full Professor of Computer-Science at the Avignon University/France since 2001. He is Vice Dean of the Faculty of Sciences and Technology and Head of the Master Degree SICOM, Communicating Systems. He has been nominated in 2020 as IEEE VTS Distinguished Lecturer. He has the French award for Doctoral supervision and Research 2017-2021. He has been recently an International Expert at the French Ministry of Foreign and European affairs (2012-2016). He served as a coordinator of the Faculty of Engineering and head of the Research Center in Informatics at the French University in Egypt. He was attributed the French award of Scientific Excellency (2011-2014). He has been as Associate Professor at the University of Technology of Belfort-Montbéliard since September 1994. He obtained the title to supervise researches (HDR 2000) from the University of Cergy-Pontoise, France. He received the PhD degree (1993), DEA (MS 1989) from the Franche-Comte University of Besançon, and BS (1987) from the University of Nancy, all in Computer Science.
For more detail: http://abderrahimbenslimane.org/

Internet of Things: Monitoring and optimization challenges for Security issues.

ABSTRACT: In Internet of Things (IoT)/Internet of Vehicles (IoV), availability of devices, reliability of communication, Quality of Service (QoS), and security are all essential for the good functioning of applications. Over the time, the state of devices and the overall network may depreciate. This is due to the challenging and failure-prone nature of IoT; consisting of a huge number of heterogeneous and resource-constrained things in terms of memory, communication, energy and computational capabilities. To ensure robustness, monitoring the network state, performance and functioning of the nodes and links is crucial, especially for critical applications. Safety-critical applications, such as a distributed fire- or burglar-alarm system, require that all sensor nodes are up and functional. Monitoring techniques for detecting, localizing and recovering network failures in IoT should be significantly developed. In this talk, we will first introduce the Internet of Things, its challenges and the monitoring concept. We will present the Research motivations and objectives for the monitoring. After presenting the stat-of-the-art research on monitoring, we will present our theoretical solutions for monitoring IoT. We target the optimization of IoT network monitoring for fault tolerance, security and quality of service purposes.

Hong ZHU
Chair of Cloud Computing and Cybersecurity Research group
School of Engineering, Computing and Mathematics
Oxford Brookes University
Oxford OX33 1HX, UK

Dr. Hong Zhu is a professor of computer science at the Oxford Brookes University, UK, where he chaired the Applied Formal Methods Research Group from 2002 to 2020 and now he chairs the Cloud Computing and Cybersecuirty Research Group since 2020. He obtained his BSc, MSc and PhD degrees in Computer Science from Nanjing University, China, in 1982, 1984 and 1987, respectively. He was a faculty member of Nanjing University, China, from 1987 to 1998. He joined Oxford Brookes University in November 1998 as a senior lecturer in computing and became a professor in Oct. 2004. His research interests are in the area of software development methodologies, including software engineering for cloud computing and software engineering of intelligent systems, formal methods, software design, programming languages, software automation, software modelling, and software testing. He has published 2 books and more than 200 research papers in journals and international conferences. He is a senior member of IEEE, a member of British Computer Society, and ACM.

Automated Exploratory Testing of Machine Learning Classifiers.

ABSTRACT: Software testing can be confirmatory or exploratory. The former aims at proving or disproving that the system under test has certain given properties, while the latter aims at discovering the properties and/or behaviours of the system under test. Exploratory testing (ET) has been widely employed in practice and proven being effective especially for testing software without a well-defined specification. Thus, it is applicable to machine learning applications, which are almost always in lack of test oracles. However, currently ET are performed manually as far as we know. This talk applies the ET principles to feature-based machine learning classifiers with focus on the automation of the testing process. It is based on the formal theory of datamorphic testing. Our goal of testing is to discover the behaviour of the ML model under test, which is characterised by the borders between classes as defined by the model. The notion of classification Pareto fronts is introduced to represent the class borders in the form of a sequence of pairs of boundary values across the borders between classes. A set of three testing strategies are proposed and formally defined as algorithms in the framework of the datamorphism testing and implemented in the automated datamorphic test environment Morphy. We prove that the proposed strategies are correct, i.e., they always terminate and generate Pareto fronts of the model under test. We introduce the notion of complete datamorphic ET systems, which ensures that exploration of the data space of the classifier can be thoroughly covered. We prove that complete ET systems exist for various types of feature-based ML classifiers and can be systematically and automatically constructed. We demonstrate that the proposed strategies are efficient via an empirical evaluation using 10 manually code classifiers and 48 ML models build from 3 real datasets using 8 different ML techniques. Finally, we discuss the benefits of ET, compare with related work, and point to the directions of future work.

Muhammad YOUNAS
School of Engineering, Computing and Mathematics - Oxford Brookes University.

Dr. Muhammad Younas is Associate Professor in Computer Science at the School of Engineering, Computing and Mathematics, Oxford Brookes University, Oxford, UK. He has significant experience of research in the areas of cloud computing, big data, web technologies, and services computing. He has published more than two hundred papers in international journals, conferences, workshops and books. His work is published/cited in top-ranked Computer Science journals and conferences such as IEEE Transactions on Industrial Electronics; IEEE Computer; Data and Knowledge Engineering; ACM SIGIR; IEEE ICWS; IEEE Cloud; IEEE Transactions on Knowledge and Data Engineering; ACM Transactions on Information Systems; IEEE Transactions on Computers; ACM SIGMOD International Conference on Management of data; Proceedings of the VLDB Endowment; IEEE International Conference on Data Engineering; and others. He also delivered keynote talks at various international conferences and symposia. He is on the review panel of various international funding councils. He serves on the editorial and advisory boards of international journals. He also serves as a chair of organizing and program committees of highly reputed international conferences. He is the member of IEEE Computer Society, IEEE Technical Committee on the Internet, IEEE Systems, Man, and Cybernetics Society, and IEEE Technical Committee on Services Computing.

NoSQL, Big Data and Transactions

ABSTRACT: NoSQL databases have been widely used for storing and processing big data. Big data is characterized by high volume, velocity, variety, veracity, and value. Big data applications make a greater demand on NoSQL databases in terms of data availability, scalability, and efficiency. To meet such a demand, NoSQL databases make certain trade-offs such as: enforcing a weaker notion of consistency (based on eventual consistency model); use of a simpler data model to support scalability; and, a lack of appropriate support for table joins and referential integrity. The consequence of such trade-offs is that NoSQL databases do not provide straightforward support for implementing ACID transactions. This talk will explore existing big data and NoSQL models, application areas, and their strengths and shortcomings. It will also present a transaction model that can be used to ensure an appropriate level of consistency and efficiency in NoSQL databases.

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