34th International Conference on Computer Theory and Applications

ICCTA 2024

14-16 December 2024
Alexandria, Egypt

Under the Auspices of

H.E. Dr. Amr Talaat
Minister of Communications and Information Technology
Egypt

Conference Program

DAY 1 - Saturday, December 14th, 2024
Venue: *AASTMT Presidency Building, AbuQir and Online*

10:00 Registration

11:00 Opening Session and Keynote Speech

Welcoming Speeches

Prof. Dr. Ayman Abdel-Hamid
Dean – College of Computing and Information Technology (Alexandria)
Arab Academy for Science, Technology, and Maritime Transport
Conference Coordinator

Prof. Dr. Ahmed Madian
IEEE Egypt Section Chair
Electronics and Computer Engineering Director, Engineering and Applied
Science School, Nile University, Egypt

Prof. Dr. Eman Tharwat
Chair - Sector Committee of Computer Science and Informatics
Supreme Council of Universities, Egypt

Prof. Dr. Alaa Abdelbary
Vice President for Postgraduate Studies and Scientific Research
Arab Academy for Science, Technology, and Maritime Transport

H.E. Prof. Dr. Ismail Abdel Ghafar Ismail Farag
President – Arab Academy for Science, Technology, and Maritime Transport

H.E. Prof. Dr. Yousry El Gamal
Former Minister of Education, Egypt
President, Computer Scientific Society

H.E. Dr. Amr Talaat
Minister of Communications and Information Technology, Egypt

Keynote Speech

"Technology Trends Outlook 2024"

H.E. Prof. Dr. Yousry El Gamal

12:30 Coffee Break

DAY 1 - Saturday, December 14th, 2024 (Cont'd)

13:30 Keynote Speech
Moderator: Prof. Dr. Mohamed Kholief

"Shaping and Creating the Future: AI and Machine Learning Driving Tomorrow's Technology and the Path to Sustainable Technology"

Prof. Dr. *Walid Salameh*
Professor of Computer Engineering and AI
Princess Sumaya University for Technology, Jordan

14:00 Keynote Speech
Moderator: Prof. Dr. Mohamed Kholief

"Wireless Sensing for Future Smart Home and Society"

Prof. Dr. Akira Uchiyama
Mobile Computing Laboratory
Osaka University, Japan

14:30 Keynote Speech
Moderator: Prof. Dr. Mohamed Kholief

""*Torath*": Digitization & Harnessing AI Capabilities to Preserve Egypt's Heritage"

Prof. Dr. Hesham ElDeeb
Professor, Electronics Research Institute, Cairo, Egypt

15:00 Lunch

End of Day 1 Activities - ICCTA 2024

DAY 2 - Sunday, December 15th, 2024

Registration: Farsi Hall – College of Engineering and Technology- AbuQir

2 Parallel Sessions: Session I and Session II

9:00 - 11:00 Session I
Venue: Farsi Hall – College of Engineering and Technology- AbuQir and *Online*

Session I Intelligent Computing I
Chairs: Prof. Dr. Khaled Mahar
Defensive Reflexes of Drones **Adnan Akpınar and Ensar Gul (Maltepe University Istanbul, Turkiye)**
Realisation of Cooperative Conveyor-AGV Smart Luggage Handling System through AI-Based Object Detection and IoT **Ahmed Hebala and Hamdy A. Ashour (AASTMT, Egypt)**
AI-based Detection of Pressure Vessel Internal Damage Mechanisms **Essam Seddik (AASTMT, Egypt), Mohamed Hewieg (Egyptian Maintenance Company, Egypt), and Rola Afify (AASTMT, Egypt)**
RNA Encoding and CLARA Clustering Algorithm for Hybrid Intrusion Detection System using UNSW-NB15 Dataset **Omar Fitian Rashid (University of Baghdad, Iraq), Mustafa Tareq (University of Technology, Iraq), and Mohammed Ahmed Subhi (Ministry of Higher Education and Scientific Research, Baghdad, Iraq)**
Effective State Estimation for a Class of Nonlinear Systems using Soft Actor-Critic Reinforcement Learning **Sohila Megahed and Ayman El-Badawy (German University in Cairo, Egypt)**
Improving the diagnosis of Gastrointestinal Diseases using a modified Alex Net **Bahaa S. Rabi, Ayman S. Selmy and Wael A. Mohamed (Benha University, Egypt)**
Class-Level Refactoring Prediction Using Machine Learning Methods **Heba Scandrani, Sarah Swerey, and Mrwan BenIdris (University of Benghazi, Libya)**
Hybrid Approach for Automatic Stemming of Chichewa Words Using Clustering with 4-grams and Affix Stripping **Stanley Ndebvu, Anderson G and Malema G (University of Botswana, Botswana), Reuben Moyo (Mzuzu University, Malawi), and Francis Ijebu (Harbin Institute of Technology, China)**
Word Sense Disambiguation of Medical Abbreviations Using Semantic Types Classification **Ghada M. Farouk, Sally S. Ismail and Mostafa M. Aref (Ain Shams University, Egypt)**

DAY 2 - Sunday, December 15th, 2024 (Cont'd)

9:00 - 11:00 Session II

Venue: Room 303 – College of Engineering and Technology- AbuQir and *Online*

Session II **Information Systems and Computer Applications**
Chairs: Prof. Dr. Saleh Mesbah
Toward an Advanced Rural Tourism Ontology for Enhancing Visitor Experiences in Morocco's Draa-Tafilalet Region **Youness Balaadich and Abdeslam Jakimi (Moulay Ismail University, Meknes Errachidia, Morocco)**
Semantic Vector-Based Query Extension for RDF Graphs **Hayam A. Hussain, Karam Gouda, Walaa Medhat, and Mona M. Arafa (Benha University, Egypt)**
Analysis of MDE Based Gamification Framework for Cognitive Evaluation **Mahbubul Islam (United International University (UIU), Bangladesh), Swapnil Biswas (Southern Illinois University Edwardsville, USA), Md. Shakil Ahmed, Md. Jobayer Rahman, Ahmed Rafi Hasan (United International University (UIU), Bangladesh), Al Amin (University of Maryland, Baltimore, USA), and Md Saddam Hossain Mukta (United International University (UIU), Bangladesh)**
Software Simulation of Hydrogen Transport Using Dense Phase **Rola Afify, Ahmed Samy, Ibrahim Hassan (AASTMT, Egypt), and Hassan El-Gamal (Alexandria University, Egypt)**
Prediction of Students' Performance in Flipped Classroom-based Vocational Education Using Data Mining Tools **Yousra O. Kamal Eldeen (Misr International Technological University, Egypt), Mohamed AbdelRaheem, and Taysir Hassan A. Soliman (Assiut University, Egypt)**
Privacy Preserving Customer Churn Prediction using Deep and Federated Learning **Yasmin Gamal Fahmy, Mohamed Waleed Fakhr, and Mohamed Kholief (AASTMT, Egypt)**
Web-Based Integrated School Management System for Enhanced Student-Teacher and Resource Accessibility **Wessam M. Salama (Pharos University, Egypt) and Moustafa H. Aly (AASTMT, Egypt)**
Optimizing SMEs Inventory: A Data-Driven Framework to Address Key Challenges in the Egyptian SMEs **Marwa AbdElwahab, Sara ElGazzar, Khaled Mahar (AASTMT, Egypt), and Hatem Abdel Kader (University of Menoufia, Egypt)**

11:00 Coffee Break

DAY 2 - Sunday, December 15th, 2024 (Cont'd)

11:30- 12:00 Keynote Speech
Moderator: Prof. Dr. Mohamed Kholief
Venue: Farsi Hall – College of Engineering and Technology- AbuQir and *Online*

"Toward Energy-Efficient HPC Systems with Dynamic Power-Performance Adjustment"

Prof. Dr. Yasutaka WADA

School of Information Science
Meisei University, Tokyo, Japan

12:00- 12:30 Keynote Speech
Moderator: Prof. Dr. Waleed Abdel Moez
Venue: Farsi Hall – College of Engineering and Technology- AbuQir and *Online*

"AI Readiness and the Role of Research"

Prof. Dr. Ahmed Tantawy

Strategy Advisor and Former Scientist, Inventor, and Business Executive, USA

13:00 - 15:00 Session III
Venue: Farsi Hall – College of Engineering and Technology- AbuQir and *Online*

Session III Cybersecurity, Distributed Systems, and Robotics
Chairs: Prof. Dr. Ayman Abdel-Hamid
QoS Under Attack: A Simulation Study on the Impact of Class Hijacking in Wireless LANs **Christos K. Christodoulou, Anastasios C. Politis, and Constantinos S. Hilas (International Hellenic University, Greece)**
Outsmarting Spam: Resilient Model for Concept Drift and Evolving Threats **George S. Yanni, H. Salah, and Fahima A. Maghraby (AASTMT, Egypt)**
A Distributed Network Model for Digital Contracts **Yousef Abdelmagid and Mohamed Hammad (Coventry University, Egypt)**
Optimal Thrust Vectored Control for Vertical Take Off and Landing Underactuated Unmanned Aerial Vehicle **Mohamed Abdel Mageed, Aly Attallah, and Ahmed Taimour Hafez (Military Technical College, Egypt)**
Efficient Detection of Black Box Adversarial Attacks in Machine Learning Systems Using Cluster-Based and Class-Based Input Patterns **Rghda Salah, Tarek Sharaf, Nada Tayel, and Doaa Shawky (University of Science and Technology, Zewail City, Egypt)**

| **Session III** |
| **Cybersecurity, Distributed Systems, and Robotics** |

Data-Driven MPC for Quadrotor UAVs Using SINDy   **Abdullah Rashad, Hashem Ghorab, Mostafa Othman, and Ayman El-Badawy (German University in Cairo, Egypt)**
A Comparative Analysis for Anomaly Detection in Blockchain Networks Using Machine Learning Techniques   **Noha E. El-Attar (Benha University, Egypt), Marwa H. Salama (Tanta University, Egypt), Mohamed Abdelfattah (Benha University, Egypt) and Sanaa Taha (Cairo University, Egypt)**
Enhancing Vulnerability Detection in Smart Contracts Using Transformer-Based Embeddings and Graph Neural Networks   **Vinay Kumar Kasula, Akhila Reddy Yadulla, Mounica Yenugula, Bhargavi Konda, and Abdullah Alshboul (University of the Cumberlands, USA)**

15:00 Lunch

End of Day 2 Activities - ICCTA 2024

DAY 3 - Monday December 16th, 2024

Registration: Farsi Hall – College of Engineering and Technology- AbuQir

2 Parallel Sessions: Session IV and Session V

9:00 - 11:00 Session IV
Venue: Farsi Hall – College of Engineering and Technology- AbuQir and *Online*

Session IV **Intelligent Computing II and Multimedia Processing**
Chairs: Prof. Dr. Mohamed Kholief
Dynamic Entropy Tuning in Reinforcement Learning Low-Level Quadcopter Control: Stochasticity vs Determinism **Youssef Mahran, Zeyad Gamal, and Ayman El-Badawy (German University in Cairo, Egypt)**
Exploiting Machine Learning and Remote Sensing for Precision Crop Mapping in Africa **Omar Ayman, Mosaab Emad Gamal, Mohamed ElSayed Atwa, Yassin Khaled, and Noha Gamal El-Din Saad (Nile University, Egypt)**
Quality of AI-Generated vs. Human-Generated Code **Tasneem Muhammed Eltabakh, Nada Nabil Soudi, and Doaa Shawky (Zewail City, Egypt)**
Automating Sanad Continuity Verification in Disconnected Hadith Using Machine Learning **Mona Hendawi, Marwan Torki, Amr Elmasry, and Ayman Khalafallah (Alexandria University, Egypt)**
Feature extraction from Hyperspectral Images using RCNN and Vision Transformer **Eman N. Abdelhafez, Ahmed Hagag, and Tamer A. Abassy (Benha University, Egypt)**
Stellar Cleanse: Pioneering CosmicNet for Superior Denoising of Space Imagery **Miada M. Aladl, Karam Gouda, Ahmed Hagag (Benha University, Egypt), and Ayman Ahmed (Egyptian Space Agency, Egypt)**
BrainDiffU-Net: A Distributed Diffusion-Based U-Net for Brain Tumor Segmentation **Parth Sharma and Pyari Mohan Pradhan (Indian Institute of Technology Roorkee, India)**
A Tiered GAN Approach for Monet-Style Image Generation **FNU NEHA, Deepshikha Bhati (Kent State University, USA), Deepak Shukla (Rutgers University, USA), and Md Amiruzzaman (West Chester University, USA)**
Data Augmentation of Electromyography Signal for Neuromuscular Disorders Diagnosis **Nahla F. Abdel-Maboud (Ain Shams University, Egypt), Silvia Stoyanova Parusheva (University of Economics Varna, Bulgaria), Marco Alfonse Tawfik, and Abdel-Badeeh M. Salem (Ain Shams University, Egypt)**

DAY 3 - Monday, December 16th, 2024 (Cont'd)

9:00 - 11:00 Session V

Venue: Room 303 – College of Engineering and Technology- AbuQir and *Online*

Session V **Intelligent Computing III**
Chairs: Prof. Dr. Mohamed Shaheen
Providing Interpretability Dimension to Bug Severity Prediction using Pseudo-labeling Semi-Supervised Technique **Saeed Mostafa Zalat, Noha Mohammad Hamed, Omaima Shoaib Ahmed, and Walid M. Abdel Moez (AASTMT, Egypt)**
Vision Language Transformation for Medical Image Captioning: Comparison of Four Pretrained CNN Networks **Salma Elgayar (Ain shams University, Egypt), Safwat Hamad (Saint Mary's College of California, USA), and El-Sayed M. El-Horbaty (Ain Shams University, Egypt)**
Cross-Modal Embedding Generalized Framework for Audio-Text Alignment **Noha Saad (Nile University, Egypt) and Ahmed ElShafee (MSA University, Egypt)**
Automated Retail Assortment Optimization Using Machine Learning and Deep Learning in Compact Stores During Crisis Periods **Nora Hassan Aboalanin, Mohamed Abo Rizka and Manar Mohamed Hafez (AASTMT, Egypt)**
Probabilistic Feature Extraction in Portfolio Optimization: Integrating PPCA with Mean Reversion and Mean-Variance Strategies **Ahmed Nabil Atwa, Mohamed Kholief, and Ahmed Sedky (AASTMT, Egypt)**
An Explainable Approach for Brain Tumor Segmentation using Grad-CAM based U-Net Models **Dina Essam Abd-Elhafeez, Yasser Ahmed Dahab, Nashwa El-Bendary, and Ossama Mohamed Badawy (AASTMT, Egypt)**
DeepStream-X: A Two-Stream Deepfake Detection Framework using Spatiotemporal and Frequency Features **Nada Mohamed Emara and Mazen Nabil Elagamy (AASTMT, Egypt)**
SQLify Me: An Automated Text-To-SQL Query Generator **Ahmed Yasser Mohamed, Mohamed Hisham Zain-Elabdeen, Salwa Ahmed Sayed, Samaa Sabry Abdelwahab, Ziad Ezzat Mohamed, Zyad Mahmoud Ali, Yomna A. Kawashti, and Hanan Hindy (Ain Shams University, Egypt)**
Intelligent Tools and Techniques for Teaching Children with Autism Spectrum Disorder **Aya Hegazy (Pharos University, Egypt), Khaled Mahar, and Nahla Belal (AASTMT, Egypt)**

11:00 Coffee Break

DAY 3 - Monday, December 16th, 2024 (Cont'd)

11:30- 12:00 Keynote Speech
Moderator: Prof. Dr. Amira Zaki
Venue: Farsi Hall – College of Engineering and Technology- AbuQir and *Online*

"AI for Sustainable Energy: Towards Net Zero Emissions"

Prof. Dr. Abdel Hamid Soliman

Professor of Signal Processing and Telecommunication
School of Digital, Technology, Innovation and Business
Staffordshire University, UK.

12:30 - 14:30 Session VI
Venue: Farsi Hall – College of Engineering and Technology- AbuQir and *Online*

Session VI Networks and Cybersecurity
Chairs: Prof. Dr. Waleed Abdel Moez
Dynamic Scalable Energy-Aware Routing Protocol for Mobile Ad hoc Networks **Liana Qabajeh, Yasmeen Amro (Palestine Polytechnic University, Palestine), and Mohammad Qabajeh (Palestine Technical University Kadoorie, Palestine)**
Intrusion Detection for IoT Networks Using SVM Algorithm **Norhan Elnady, Aya Adel, and Wael Badawy (Egyptian Russian University, Egypt)**
Wireless Body Area Networks: Antenna Design **Heba Abdelhamid Elkayal (Pharos University in Alexandria, Egypt), Moustafa H. Aly (AASTMT, Egypt), Mazen Tamer Aletreby, Mohamed Atef Sabry, Youssef Adel Elshazly, Youssef Mohamed Bakr, Mohamed Mostafa Ahmed, and Mohamed Saleh (Pharos University in Alexandria, Egypt)**
Edge Device Implementation for Smart Agriculture and Insect Pests Detection **Adel Eltoweiry, Hania Abouelezz, Mohammed A.-M. Salem, and Mohamed A. Abd El Ghany (German University in Cairo, Egypt)**
Smart Grid Prediction Using Federated Learning and Fully Homomorphic Encryption **Islam M. Saad, Mohamed Waleed Fakhr (AASTMT, Egypt), Tamer Abdel Kader (Galala University, Egypt), and Nada M. Abdel Aziem (AASTMT, Egypt)**
Predicting Vulnerability Exploit Complexity Based on Exploit Scripts **Daniel Rosenberger and Alexander Jesser (Heilbronn University of Applied Sciences, Germany)**
Anomaly Detection of Object-Centric Event Logs Using Event Knowledge Graph **Omnia Osama Amin, Walid M. Abdel Moez, and Mohamed Shaheen (AASTMT, Egypt)**

14:30 Coffee Break

End of ICCTA 2024 Activities

ICCTA 2024 Committees

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President, Computer Scientific Society

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