Program Summary of

2020 37th National Radio Science Conference (NRSC)

Organized by

Academy of Scientific Research and Technology
National Radio Science Committee (NRSC)

and

German University in Cairo (GUC),
Cairo, Arab Republic of Egypt

8 – 10 September 2020, Cairo, Egypt
Program Summary of

2020 37th National Radio Science Conference (NRSC)

8 – 10 September 2020, Cairo, Egypt

Publication Chair:
Prof. Hesham El-Badawy

Edited by:
a.Prof. Rowayda Sadek
Dr. Mohamed Ashour

2020 37th National Radio Science Conference (NRSC), Proceedings, 8 – 10 September 2020, Cairo, Egypt.

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IEEE Catalog Number: CFP20427-PRT
ISBN: 978-1-7281-6817-3
Deposit Number: 7509-2020
NRSC2020 Program Summary

**Tuesday, September 8th, 2020**

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<td><em>Fully Printed Radio Frequency Electronics: Flexible, Wearable and Disposable</em></td>
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<td><em>Atif Shamim</em>  Computer, Electrical and Mathematical Sciences and Engineering Division, King Abdullah University of Science and Technology (KAUST), Kingdom of Saudi Arabia (KSA)*</td>
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<th>Session B1: Antenna Design &amp; Applications</th>
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<td><strong>Adaptive Accelerators and Processor Architectures</strong></td>
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<td><strong>An Industrial Design Approach, Implementation, and Application: Perspectives of Surveillance Radar Systems</strong></td>
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<td>Esmat Abd-El fattah¹, Abd-El-Rahman El-Bardawiny², Nabil Girgis², Khaled Hussein², Alaa S. Hafez³, Fathy Ahmed² and Mohamed Mabrouk³</td>
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<td><em>¹Electronics Research Institute, ²Military Technical College &amp; ³Air Defense Forces, Ministry of Defense, Egypt</em></td>
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<td>Compound Semiconductors: Challenges and Promises</td>
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<td>Ferdinand Scholz</td>
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<td>Best Paper and Best Student Awards</td>
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Tuesday, September 8\textsuperscript{th}, 2020

10:30-12:30

\textit{Opening Ceremony}

13:00-14:00

\textbf{Keynote Speech KS-1}

\textbf{FULLY PRINTED RADIO FREQUENCY ELECTRONICS:}
\textbf{FLEXIBLE, WEARABLE AND DISPOSABLE}

Atif Shamim

\textit{Computer, Electrical and Mathematical Sciences and Engineering Division}
\textit{King Abdullah University of Science and Technology (KAUST), Kingdom of Saudi Arabia (KSA)}

\textbf{Chair: Prof. Elsayed Mostafa}

14:15-16:00

\textbf{Session C1}

\textbf{COMMUNICATION SYSTEMS}

\textbf{Chair: Prof. Said El-Khamy}
\textbf{Co-Chair: Dr. Ahmed El-Trass}

\textbf{C1 Channel Estimation Techniques for Wideband MIMO-OFDM Communication Systems using Complementary Codes Two-Sided Sequences}

Said El-Khamy\textsuperscript{1}, Noha Korany\textsuperscript{1}, and Hossam Hassan\textsuperscript{1}

\textsuperscript{1}Alexandria University
C2 Adaptive Femtocell Accessing Control in a 5G Heterogeneous Network
Maryhan Mohamed\textsuperscript{1}, Hesham El-Bbadawy\textsuperscript{2}, Reem Abdelhadi\textsuperscript{2}, and Abdelhady Ammar\textsuperscript{3}
\textsuperscript{1}Higher Technological Institute, \textsuperscript{2}National Telecommunication Institute, \textsuperscript{3}Al-Azhar University

C3 Security Enhancement of Stream Cipher Algorithms in Advanced Mobile Communications
Zakaria Abd Elwahab\textsuperscript{1}, Talaat Elgarf\textsuperscript{1}, and Abdelhalim Zekry\textsuperscript{2}
\textsuperscript{1}Higher Technological Institute, \textsuperscript{2}Ain Shams University

14:15-16:00

Session D1

irable Devices

Chair: Prof. Khaled Shehata
Co-Chair: a. Prof. Ahmed Madian

D1 Design of CMOS Low Noise Amplifier using an Automated System-on-Chip Methodology
Ibrahim Abdalla\textsuperscript{1}, Kawther Arafa\textsuperscript{2}, Fathi Farag\textsuperscript{1}, and Mohamed Ibrahim\textsuperscript{1}
\textsuperscript{1}Zagazig University, \textsuperscript{2}Electronics Research Institute

D2 Enhanced Radon Transform based Video Micro Movement Magnification
Gamal Fahmy\textsuperscript{1}, Mamdouh Fahmy\textsuperscript{1}, and Omar Fahmy\textsuperscript{2}
\textsuperscript{1}Assiut University, \textsuperscript{2}Future University

D3 A Low Power Charge Steering Based Frequency Divider
Mohamed Salah\textsuperscript{1}, Emad Hegazy\textsuperscript{1}, and Mohamed ElNozahi\textsuperscript{1}
\textsuperscript{1}Ain Shams University

D4 High-Speed Comparator Design for RF-to-Digital Receivers Radio Applications
Ahmed Sakr\textsuperscript{1}, Aziza Hussein\textsuperscript{2}, Mahmoud Abdelghany\textsuperscript{1}, and Ghazal Fahmy\textsuperscript{3}
\textsuperscript{1}Minia University, \textsuperscript{2}Effat University (Saudi Arabia), \textsuperscript{3}National Telecommunication Institute
14:15-16:00

Session K1

BIOMEDICAL APPLICATIONS I

Chair: Prof. El-Sayed Mostafa
Co-Chair: Prof. Ahmed El-Mahdy

K1 Automated Diabetic Retinopathy Grading using Convolutional Neural Networks
Doaa Elswah1, Ahmed Elnakib1, and Hossam El-Din Moustafa1
1Mansoura University

K2 New Approaches to Handle Missing Values for Accurate Diabetes Prediction using Machine Learning
Elhossiny Ibrahim1, Marwa Shouman1, Hanaa Torkey1, Ezz El-Din Hemdan1, and Ayman El-Sayed1
1Menoufia University

K3 A Miniaturized Dual Band Rectangular Spiral Loop Antenna for Biomedical Implants
Abdullah Mahfouz1, Ali Ibraheem1, and Osama Haraz1
1Assiut University

K4 Microstrip Patch Antenna with Improved Characteristics for Brain Tumor Detection
Rehab Helmy1, Ahmed Elkornay1, Adel Saleeb1, and Nihal Areeed2
1Menoufia University, 2Mansoura University

Wednesday, September 9th, 2020
Session C2

Signal, Image and Video Processing

Chair: Prof. Mahmoud El-Hadidi
Co-Chair: a. Prof. Rowayda Sadek

C4 Application of Artificial Neural Networks to the Automation of Bandgap Reference Synthesis
Nabil Soliman¹, Karim Khalil¹, Ahmed Abd El Khalik¹, and Hesham Omran¹
¹Ain Shams University

C5 Improvement Joint Detection and Tracking of Small RCS Targets from Image Observations
Ibrahim Salim¹, Mohamed Barbary², and Mohamed Hassan¹
¹Arab Academy for Science, Technology & Maritime Transport, ²Alexandria University

C6 Single Image Super Resolution using Discrete Cosine Transform Driven Regression Tree
Yasser Badran¹, Gouda Salama¹, Tarek Mahmoud¹, Aiman Mousa¹, and Adel Moussa²
¹Military Technical College, ²University of Calgary (Canada)

C7 Complexity Reduction of Finite-Length MMSE Equalization Using FFT
Michael Ibrahim¹,²
¹Ain Shams University, ²British University in Egypt

Session B1

Antenna Design
Chair: Prof. Hadia El-Hennawy
Co-Chair: a. Prof. Hend Malhat

B1 Meander Dipole Antenna for Low Frequency Applications
Mohamed Ismail¹, Angie Eldamak¹, and Hani Ghali²
¹Ain Shams University, ²British University in Egypt

B2 Angular Displacement Sensor Based on Planar Circular Split Ring Resonator
Esraa El-Refaey¹, Hend Malhat¹, and Saber Zainud-Deen²
¹Menoufia University, ²Badr University in Cairo

B3 Graphene-Based AMC Polarization Converter for Antenna Applications at Microwave Frequency Band
Ahmed Mabrouk¹, Saber Zainud-Deen², Hend Malhat¹, Ahmed Ibrahim³, and Hesham Hamed³
¹Menoufia University, ²Badr University in Cairo, ³Minia University

B4 Bandwidth Enhancement For Meander Dipole Antenna in MHz range
Mohamed Ismail¹, Angie Eldamak¹, and Hani Ghali²
¹Ain Shams University, ²British University in Egypt

B5 Synthesis of Circular Antenna Arrays for Realization of Broadside Chebyshev Linear Array Patterns in the Elevation Plane
Amr Hussein¹, Lamia Alnaggar¹, and Moustafa Abdelnaby¹
¹Tanta University

11:30-12:30

Keynote Speech KS-2

ADAPTIVE ACCELERATORS AND PROCESSOR ARCHITECTURES
Micheal Hübner
Brandenburg University of Technology in Cottbus, Germany

Chair: Prof. Said El-Khamy

X
12:30-14:00

**Plenary Session**

**AN INDUSTRIAL DESIGN APPROACH, IMPLEMENTATION, AND APPLICATION: PERSPECTIVES OF SURVEILLANCE RADAR SYSTEMS**

Esmat Abd-Elfattah¹, Abd-El-Rahman El-Bardawiny², Nabil Girgis², Khaled Hussein², Alaa Hafez³, Fathy Ahmed² and Mohamed Mabrouk³

**Technical crew:**
Ashraf Selium¹, Ahmed Attia¹, Haytham Abdulla¹, Dalia Nashaat¹, Tamer Ali¹, Hesham Abd-El-Hady¹, Mohamed Shaker¹, Osama Dardeer¹, Hesham Yamani¹, Amgad Said¹, Mohamed Shalaby², Walid Saad², Abdelrahman El-Akhdar³, Ahmed Alieldin⁴, Mahmoud Abd Elzaher⁴, Ahmed Mansour⁴, Ahmed Amar⁴, Bahaeldin Elsor⁴, Hossam Hassan⁴, Kamal Mustafa⁴, Mostafa Abdalla⁴, Alla Eid⁴, Mohammad Abdul-Atty⁴, Anas Elfaramawy⁴, Ahmed Shora⁴, Ahmed El-Agamy⁴, Moustafa Yassen⁵

¹Electronics Research Institute, ²Military Technical College, ³Air Defense Forces, ⁴Ain Shams University, ⁵Arab Academy of Science, Technology and Maritime, ⁶Alexandria University, ⁷Cairo University, ⁸Al Azhar University,

**Moderator:** Prof. Esmat Abd-Elfattah

14:30-16:00

**Session B2**

**ANTENNA APPLICATIONS**

**Chair:** Prof. Saber Zainud-Deen

**Co-Chair:** a.Prof. Ahmed Ibrahim

B6 **Flexible Patch Antennas on Filter Paper Substrate for Biosensing Applications**

Angie Eldamak¹, and Elise Fear²

¹Ain Shams University, ²University of Calgary (Canada)
B7  Mutual Coupling Reduction Between MM-Wave Microstrip Antennas Using CSRR Metamaterial Structure  
Allam Ameen¹, and Basma Yousef², Ahmed M. Attiya¹  
¹Electronics Research Institute, ²Delta Higher Institute for Engineering and Technology

B8  Polarization Reconfigurable Dielectric Resonator Antenna Based on Liquid Flow Control  
Hend Malhat¹, and Saber Zainud-Deen²  
¹Menoufia University, ²Badr University in Cairo

B9  Radar Cross-Section Reduction Using Polarization Conversion Metasurface  
Mona Badawy¹, Saber Zainud-Deen¹² and Hend Malhat¹  
¹Menoufia University, ²Badr University in Cairo

14:30-16:00

Session K2  
BIOMEDICAL APPLICATIONS II

Chair:  Prof. Imbaby Mahmoud  
Co-Chair: a. Prof. Amr Talaat

K5  Automatic Detection of Exudates and Hemorrhages in Fundus Images  
Mohamed Berbar¹  
¹Menoufia University

K6  A Novel Feature Selection Method for Enhancing Cancer Diagnosis based on DNA Microarray  
Mostafa Atlam¹, Hanaa Torkey¹, Hanaa Salem², and Nawal El-Fishawy¹  
¹Menoufia University
K7  Deep Joint Segmentation of Liver and Cancerous Nodules from CT Images
Nermeen Elmenabawy¹, Ahmed Elnakib¹, and Hossam El-Din Moustafa¹
¹Mansoura University

K8  DCT Compression Technique for EEG Signals and its Effect on EEG Seizure Prediction
Nancy El-Fequi¹, Amira Ashour¹, Entessar Gemeaa¹, and Fathi Abd El-Samie²
¹Tanta University, ²Menoufia University

Thursday, September 10th, 2020

9:30-11:00

Session C3  COMMUNICATION NETWORKS
Chair: Prof. Hesham El-Badawy
Co-Chair: Prof. Hany Hammad

C8  Application of Wireless Sensor Networks Localization in Near Ground Radio Propagation Channel
Weaam Taha¹, Hala Nafea¹, and Fayez Zaki¹
¹Mansoura University
C9 An Energy Efficient Constraint RRH to BBU Association in Cloud Radio Access Networks
Hadil Hesham, Mohamed Ashour, and Tallal Elshabrawy
1German University in Cairo

C10 Channel Matched Sparse Non-Orthogonal Frequency Division Multiplexing (CM-S-NOFDM) Operating in Underwater Acoustic Channels
Dalia Mohamed, and Said El-Khamy
1Alexandria University

C11 A Novel Monopole Antenna for 60 GHz mmW Communications
Tarek Mneesy, Radwa Khalil, Amira Zaki, and Wael Ali
1Arab Academy for Science, Technology & Maritime Transport

9:30-11:00
Session D2

Optical & Electronic Devices

Chair: Prof. Diaa Khalil
Co-Chair: a. Prof. Ahmed Heikal

D5 Tunable Microwave Single-Bandpass Photonic Filter Based on Amplified MEMS-Based Gires–Tournois Interferometer
Hussein Kotb, Yasser Sabry, Mohab Abdallah, Marwan Sayed, and Haitham Omran
1National Telecommunication Institute, 2Ain Shams University, 3German University in Cairo

D6 Optical Cavity with Large Operational Bandwidth using Silicon-Based Slotted Micromirrors
Mohab Abdallah, Yasser Sabry, Ahmad Mahfouz, Frédéric Marty, Tarik Bourouina, Haitham Omran
1German University in Cairo, 2Ain Shams University, 3Université Paris-Est, ESIEE Paris (France)

D7 Reliability Analysis Model of the Digital Reactor Protection System
Amany Saber, Mohamed Shaat, Marwa Shouman, Hanaa Torkey, and Ayman El-Sayed
1
1 Nuclear Research Center, 2 Menoufia University

D8 Expert Guided Analog Layout Placement and Routing Automation for Deep Nanotechnologies
Fady Atef¹, Mohamed Dessouky¹, Sherif Ahmed¹, and Soha Hamed¹
¹Ain Shams University

11:00-12:00

Keynote Speech KS-3

COMPUND SEMICONDUCTORS: CHALLENGES AND PROMISES
Ferdinand Scholz
Institute of Functional Nanosystems, Ulm University, Germany

Chair: Prof. Khaled Shehata

12:30-14:00

Poster Session
P1  Dual Mode Crash Avoidance
Ahmed Anwar, Ahmed Saad, Hind Ashraf, Marehan Refaat, Nagham Wael, Omar Shaaban, Omar Khaled, and Omar El-sayed

Supervised By: Hassan Mostafa & Mohsen Rashwan

Cairo University

P2  Indoor Localization System
John Abdallah, Bishoy Adel, Bassel Amin, Mina Emad, Mina Wagdy, Abdelrahman Sayed, Febronia Nabil, Marina Nageh. And Caroline Sabri

Supervised By: Mohamed El-Shimy

Alexandria University

P3  Intelligent Mobile Seizure Prediction Application Based on Large EEG Data
Aya Haggag, Hossam Elghamry, and Mohamed Ghoneim

Supervised By: Dr. Tawfik Ismail, Dr. Mohamed Saeed

Nile University

P4  AI-Based Advertisement System
Ahmed Samir, Ahmed Yamout, Ebraam Emil, and Mohamed Ayman

Supervised By: Tawfik Ismail, Mohamed Saeed

Nile University

P5  Towards an Integrated Deep Learning-Based Perception Model for Autonomous Vehicles
Gad Mohamed, and Ahmed Hammad

Supervised By: Mohamed Darweesh, Nermin Negied

Nile University

P6  FEM Simulation Study of 1st Order Cassini Ion Traps
Hana Abdelhadi

Supervised By: Frank Gunzer

German University in Cairo (GUC)

P7  Gawla: A Museum Tour Application
Salma Sdek, Almoatasem Haggag, Abdelrahman Khaled, and Dina Mahfouz

Supervised By: Frank Gunzer

German University in Cairo (GUC)
Supervised By: Mohamed Ashour

P8 Performance Evaluation of LoRa and ICS-LoRa-based Modulation
Sondos Tarek, Ezzeldin Tarek, and Mohamed Ali

German University in Cairo (GUC)

Supervised By: Tallal El-Shabrawy

P9 Agri Sense: Smart Autonomous IoT Agricultural Monitoring system
M. Noaman, M. Elshobary, M. Diab and N. Hosny

Arab Academy for Science and Technology and Maritime Transport

Supervised By: Hussien Elattar - Albashir Adel Youssef

P10 Real-Time Depth Estimation and Lane Detection System Based on Machine Learning
Hazem Ibrahim, and Omar Fathy

October University for Modern Sciences and Arts

Supervised By: Mohamed Saeed

P11 Autonomous Braking System for Cars Using Machine Learning Algorithms
Ahmed Elsayed, and Mark Saad

October University for Modern Sciences and Arts

Supervised By: Mohamed Darweesh

P12 Autonomous Fire-Fighting Robot
Mustafa Hisham, and Mohamed Osama

October University for Modern Sciences and Arts

Supervised By: Mohamed Darweesh and Ahmed Mahmoud

P13 Intelligent Crash Avoidance System for Road Intersection Based on Machine Learning
Ramy Mohamed, and Hania Ahmed

October University for Modern Sciences and Arts

Supervised By: Mohamed Darweesh
P14  Intelligent Agriculture disease detection based on deep learning
Ahmed Taha, and Youssif Mohamed

Supervised By: Mohamed Darweesh

October University for Modern Sciences and Arts

P15  Real-Time Forward Crash Avoidance System Based on Computer Vision and Deep Learning
Ahmed Mahmoud, Andrew Ezzat, Mahmoud Younis and Rania Abdullatif

Supervised By: Mohamed Darweesh

Institute of Aviation Engineering and Technology (IAET)

P16  V2X Communication
Ahmed Ehab Yehia, Michel Emad, Rawda Metwally, and Yomna Ragab

Supervised By: Said E. El-Khamy

Alexandria University

P17  Further LoRa Capacity Enhancement Through ICS-LoRa Expansion
Ezzeldin Mohamed

Supervised By: Phoebe Nashed, Minar El-Asser, Tallal El-Shabrawy, Mohamed Ashour

German University in Cairo (GUC)

P18  Secure Communication Through Blowfish and LSB Steganography
Farah Hemeida

Supervised By: Wassim Alexan

German University in Cairo (GUC)

14:00-15:30

Closing Ceremony

BEST PAPER AND BEST STUDENT PAPER AWARDS
CLOSING CEREMONY