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Wednesday, May 10, 10:30 - 12:00

Hot Topics in RFID

Invited Papers

Wednesday, May 10, 13:00 - 14:30

1A: Protocols & Security; Internet of Things (IoT) & Next-Gen Physical Layer

Chair: Matthew S Trotter (GTRI & Georgia Tech Research Institute, USA)

1:00 A Better Channel Code than FM0 for Next-Generation RFID 1

Gregory Durgin (Georgia Tech, USA); Brian Degnan (Georgia Institute of Technology, USA)

1:22 Design of Backscatter-Based Tag-to-Tag System 6

Yasha Karimi (Stony Brook University, USA); Akshay Athalye (Research Foundation SUNY, USA); Samir R. Das and Petar M. Djurić (Stony Brook University, USA); Milutin Stanacevic (SUNY Stony Brook, USA)

1:45 Perfect Pulses for Ambient Backscatter Communication 13

Michael Varner (Georgia Institute of Technology, USA); Rajib Bhattacharjee (Georgia Tech Research Institute, USA); Greg Durgin (Georgia Tech, USA)

2:07 Beyond the Limits of Classic Backscattering Communications: a Quantum Tunneling RFID Tag 20

Francesco Amato (Georgia Institute of Technology, USA); Hakki Torun (Georgia Institute of Technology, USA); Gregory Durgin (Georgia Tech, USA)

1B: Protocols & Security

Chair: Michael Abood (CalPoly, USA)

1:00 Secure UHF-RFID Tag for Vehicular Traffic Management System 26

Qiang Li (Shanghai Quanray Electronics Co., Ltd, P.R. China); Zhengliang Sun and Jin Huang (Traffic Management Research Institute, P.R. China); Sha Liu and Junyu Wang (State Key Lab of ASIC & System, Fudan University); Na Yan (State Key Lab of ASIC & System, Fudan University, P.R. China); Lei Wang (Shanghai Quanray Electronics Co., Ltd, P.R. China); Hao Min (State Key Lab of ASIC & System, Fudan University, P.R. China)

1:22 Reverse Engineering the Communications Protocol of an RFID Public Transportation Card 30

Paula Fraga-Lamas and Tiago Manuel Fernández-Caramés (University of A Coruña, Spain)

1:45 On the Simon Cipher 4-Block Key Schedule as a Hash 36

Brian Degnan (Georgia Institute of Technology, USA); Gregory Durgin (Georgia Tech, USA); Suigin Maeda (Independent, Japan)

2:07 SecureConfig: NFC and QR-Code based Hybrid Approach for Smart Sensor Configuration 41

Thomas Ulz, Thomas W Pieber and Christian Steger (Graz University of Technology, Austria); Christian Lesjak (Infineon Technologies Austria AG, Austria); Holger Bock and Rainer Matischek (Infineon Technologies, Austria)

Wednesday, May 10, 14:45 - 16:15

P1: Poster Session - N/A

Poster Session

Chair: Joshua D Griffin (Northwest Nazarene University, USA)

Design and Applications for a Large-Area UHF RFID Reader Antenna System N/A

Xiaotian Li (Mid Sweden University, Sweden); Johan Sidén and Henrik Andersson (Mid-Sweden University, Sweden)

A Retrodirective Feed Network for Backscatter RFID Tags Using a Rat-Race Coupler N/A

Mohammad Alhassoun (Georgia Institute of Technology, USA); Gregory Durgin (Georgia Tech, USA)

Development of a mobile payment system using Smartphones with integrated NFC (Near Field Communication) and Open-Sources Tools: Android, Arduino and APP Inventor N/A

Ernesto Maldonado (Universidade Estadual de Campinas, Brazil); Ioshiaki Doi and Leandro Manera (Unicamp, Brazil)

A Real-Time Pipe Monitoring Cyber-Physical System for the Shipyard of the Future N/A

Paula Fraga-Lamas, Tiago Manuel Fernández-Caramés and Diego Noceda-Davila (University of A Coruña, Spain); Manuel Ángel Díaz-Bouza (Unidad Mixta de Investigación Navantia-UDC, Spain)

Inventory Inaccuracy In Warehouses: A Simulation N/A

Megan Garcia (California Polytechnic State University San Luis Obispo (Cal Poly), USA); Tali Freed (Cal Poly San Luis Obispo, USA)

An FPGA-based ISO18000-6C/ EPC Gen 2 ASIC Development Testbed with Fiber Optic Tamper Detection and Hardware AES Encryption N/A

Thang Phu, Alexander Hoang and Joshua Ensworth (University of Washington, USA); Faranak Nekoogar (Lawrence Livermore National Laboratory, USA); Matthew Reynolds (University of Washington, USA)

RF Bar Coding of PE Pipes Using Alternating Conductive Structures N/A

Jordan Trewitt, Peter J. Hawrylak and Michael Keller (University of Tulsa, USA)

Controllable Resonators for Enhanced Detection of Chipless RFID Sensors N/A

Marcos Martinez and Daniel van der Weide (University of Wisconsin - Madison, USA)

A 500C Tolerant Ultra-High Temperature 2.4 GHz 32 Bit Chipless RFID Tag with a Mechanical BPSK Modulator N/A

Matthew Reynolds (University of Washington, USA)

A Low Power 2.4 GHz Superheterodyne Receiver Architecture with External LO for Wirelessly Powered Backscatter Tags and Sensors N/A

Alexander Hoang, Joshua Ensworth and Matthew Reynolds (University of Washington, USA)

Smart Packaging for the Internet of Things: Passive UHF RFID Yarn

Gianfranco Andia Vera and Emmanuel Arene (Primo1D, France)

Securing the Global Supply Chain with the Container Security Device N/A

Christopher Valenta (Georgia Tech Research Institute & Electro-optical Systems Laboratory, USA); Priyank Patel (Georgia Institute of Technology, USA); David Burke, Ralph Herkert, Tim Strike and Yevgeniy Agalov (Georgia Tech Research Institute, USA); Gisele Bennett (Georgia Institute of Technology, USA)

SARFID: a versatile localization technique in UHF-RFID systems N/A

Alice Buffi and Paolo Nepa (University of Pisa, Italy)

Using Machine Learning and RFID Localization for Advanced Logistic Applications N/A

Florian Geigl (Detego GmbH); Christine Moik (Detego GmbH, Austria); Stefan Hinteregger (Graz University of Technology, Austria); Michael Goller (Detego GmbH, Austria)

Missing State-Data Recovery in the HIMR RFID Localization and Tracking System N/A

Qian Yang (Georgia Institute of Technology, USA); Gregory Durgin (Georgia Tech, USA)

Backscatter Sensor Localization Via Synthetic Aperture Radar (SAR) Imaging N/A

Xiaojie Fu, Andreas Pedross-Engel, Claire Watts and Matthew Reynolds (University of Washington, USA)

RFID Interrogation Zone Filtering with a Differential Phase Measurement and Posterior Cluster Analysis N/A

Kohei Yamamoto and Yuki Sato (Keio University, Japan); Nitish Rajoria (Keio University, India); Jin Mitsugi (Keio, Japan)

3D Backscatter Imaging with Millimeter Wave Massive MIMO N/A

Matthew Reynolds (University of Washington, USA)

Implementation of Smart Cold Chain Tag Application Using a Wi-Fi Backscatter Communication System N/A

Young-Han Kim and Hyun-Seok Ahn (Korea Electronics Technology Institute (KETI), Korea); Changseok Yoon, Yongseok Lim and Seung Ok Lim (Korea Electronics Technology Institute, Korea)

Distributed Sensing for Space Applications Using Modulated Backscatter N/A

Lucas Schamber, Curtis Garner, Cassie Wade, Daniel Slemmer, Jordan Poundstone, Brandon Pankey, Dan Lawrence, Stephen Parke and Joshua D Griffin (Northwest Nazarene University, USA); Cheng Qi, Mohammad Alhassoun and Michael Varner (Georgia Institute of Technology, USA)

RFID in the Classroom: Design of a Battery-Free Sensing Platform N/A

Evan Rose, Nolan Lodden, Matthew Pinnow, Thomas Abbott and Stewart Thomas (Valparaiso University, USA)

A Dual-Band Wireless Power Transfer and Backscatter Communication Approach for Implantable Neuroprosthetic Devices N/A

Eleftherios Kampionakis and Apoorva Sharma (University of Washington, USA); Jose Arenas (University of Washington, Chile); Matthew Reynolds (University of Washington, USA)

Tolling in the Air: An ETC solution for overcrowded public bus transportations in Beijing N/A

Yinuo Zhao, Xuzhou Huang, Hongyuan Ye, Zhuo Chen, Jian Yang, Shaodong Ma and Yongtian Wang (Beijing Institute of Technology, P.R. China)

UHF RFID Based Gesture Control System for Smart City Transportation N/A

Wenhai Zhang (University of Macau, Macao); Kam Weng Tam (University of Macau, P.R. China); Keng Weng Lao (University of Macau, Macao); Wan Ian Lou (Sacred Heart Canossian College, Macao); Eddie Chiang (JESIC Technology LTD, Macao)

Environmental and Commercial Impact of City-Wide Reusable Food Container System N/A

Austin Lynch, Jessica Chao, Zachary Ho, Steven Johnson, Jonnathan Terry and Isaac Williams (California Polytechnic State University San Luis Obispo, USA); Tali Freed (Cal Poly San Luis Obispo, USA); Daniel Dobkin (Enigmatics, USA)

Wednesday, May 10, 16:15 - 17:00

Mega Challenge on Smart Cities

Thursday, May 11

Thursday, May 11, 10:30 - 12:00

2A: Sensors

Chair: Ken Yasui (CalPoly, USA)

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