

MILCOM 2023 - 2023 IEEE Military Communications Conference

**Boston, Massachusetts, USA
30 October – 3 November 2023**

Pages 1-483



**IEEE Catalog Number: CFP23MIL-POD
ISBN: 979-8-3503-2182-1**

**Copyright © 2023 by the Institute of Electrical and Electronics Engineers, Inc.
All Rights Reserved**

Copyright and Reprint Permissions: Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limit of U.S. copyright law for private use of patrons those articles in this volume that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

For other copying, reprint or republication permission, write to IEEE Copyrights Manager, IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854. All rights reserved.

****** This is a print representation of what appears in the IEEE Digital Library. Some format issues inherent in the e-media version may also appear in this print version.***

| | |
|-------------------------|-------------------|
| IEEE Catalog Number: | CFP23MIL-POD |
| ISBN (Print-On-Demand): | 979-8-3503-2182-1 |
| ISBN (Online): | 979-8-3503-2181-4 |
| ISSN: | 2155-7578 |

Additional Copies of This Publication Are Available From:

Curran Associates, Inc
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: (845) 758-0400
Fax: (845) 758-2633
E-mail: curran@proceedings.com
Web: www.proceedings.com

TABLE OF CONTENTS

| | |
|--|----|
| Channel Aware Adversarial Attacks Are Not Robust..... <i>Sujata Sinha, Alkan Soysal</i> | 1 |
| Data-Driven Constraint Mining for Realizable Adversarial Samples..... <i>Bleema Rosenfeld, Sridhar Venkatesan, Rauf Izmailov, Matthew Yudin, Constantin Serban, Ritu Chadha</i> | 7 |
| The Efficacy of Transformer-Based Adversarial Attacks in Security Domains..... <i>Kunyang Li, Kyle Domico, Jean-Charles Noirot Ferrand, Patrick McDaniel</i> | 13 |
| Joint Optimization of E2E Latency, FPS, Energy, and Confidentiality for Surveillance UAV..... <i>Heechan Kim, Honggu Kang, Joonhyuk Kang</i> | 19 |
| Channel-Adaptive Dynamic Neural Networks for Low-Complexity Distributed Signal Awareness | 27 |
| <i>Mohammad Abdi, Jonathan Ashdown, Kurt Turck, Francesco Restuccia</i> | |
| RoamML: Distributed Machine Learning at the Tactical Edge..... <i>Simon Dahdal, Filippo Poltronieri, Alessandro Gilli, Mauro Tortonesi, Roberto Fronteddu, Raffaele Galliera, Niranjan Suri</i> | 33 |
| M3: Towards Efficient Mixed Machine Learning Model Co-Location on Constrained Edge Devices..... <i>Luis Angel D. Bathen, Simeon Babatunde, Rhui Dih Lee, Achintya Kundu, Laura Wynter</i> | 39 |
| Characterizing Distributed Inferencing at the Edge in Resource-Constrained Environments | 45 |
| <i>Scott Brown, David Harman, Cleon Anderson, Matthew Dwyer</i> | |
| DeepMPR: Enhancing Opportunistic Routing in Wireless Networks Via Multi-Agent Deep Reinforcement Learning..... <i>Saeed Kaviani, Bo Ryu, Ejaz Ahmed, Deokseong Kim, Jae Kim, Carrie Spiker, Blake Harnden</i> | 51 |
| Private Membership Aggregation..... <i>Mohamed Nomeir, Sajani Vithana, Sennur Ulukus</i> | 57 |
| Open Source-Based Over-the-Air 5G New Radio Sidelink Testbed | 63 |
| <i>Melissa Elkadi, Deokseong Kim, Ejaz Ahmed, Anh Le, Moein Sadeghi, Paul Russell, Bo Ryu</i> | |
| DOTMFLPI Analysis of 5G for Several Military Use Cases | 71 |
| <i>Harri Saarnisaari, Relja Djapic, Topi Tuukkanen, Warren Low, Nicolas Chuberre, Souradip Saha</i> | |
| Anti-Jamming Resilient LEO Satellite Swarms | 77 |
| <i>Venkata Srirama Rohit Kantheti, Chia-Hung Lin, Shih-Chun Lin, Liang C. Chu</i> | |
| Covert and Quantum-Safe Tunneling of Multi-Band Military-RF Communication Waveforms Through Non-Cooperative 5G Networks | 83 |
| <i>Elias Alwan, John Volakis, Md Khadimul Islam, Udara De Silva, Arjuna Madanayake, Jose Angel Sanchez, George Sklivanitis, Dimitris A. Pados, Luke Beckwith, Reza Azarderakhsh, Madhuvanti Muralkrishnan, Rishabh Rastogi, Aniruddha Hore, Eric W. Burger</i> | |
| Impact of Imperfect Channel State Information on Achievable Rate with Zero-Forcing Precoding in Massive MIMO Systems for Multi-Numerology | 89 |
| <i>Hyunsoo Son, Girim Kwon, Hyuncheol Park, Joo Sung Park</i> | |

| | |
|---|-----|
| Quantum MBSE and Quantum SysML | 95 |
| <i>Steven J. Silverman, Trey Jiron</i> | |
| Computational Simulation Framework for Tactical Quantum Network Applications..... | 100 |
| <i>Dashiell L. P. Vitullo, Trevor Cook, Daniel E. Jones, Lisa M. Scott, Brian T. Kirby</i> | |
| Spread Photon Transceiver for Quantum Secure Communications..... | 103 |
| <i>Wesley Webb, Michael S. Bullock, Samuel H. Knarr, Timothy C. Burt, Jim A. Drakes, Saikat Guha, Boulat A. Bash, Victor G. Bucklew</i> | |
| Pragmatic Quantum-Classical Phase Estimation of a Quantum Channel..... | 109 |
| <i>Austin Bristow, Kwang-Cheng Chen</i> | |
| Low-Complexity Decoding Algorithm Utilizing Degeneracy for Quantum LDPC Codes | 115 |
| <i>Jaemin Kim, Hyunwoo Jung, Jeongseok Ha</i> | |
| Detecting Unknown Attacks in IoT Environments: An Open Set Classifier for Enhanced Network Intrusion Detection | 121 |
| <i>Yasir Ali Farrukh, Syed Wali, Irfan Khan, Nathaniel D. Bastian</i> | |
| IoBT-MAX: A Multimodal Analytics eXperimentation Testbed for IoBT Research..... | 127 |
| <i>Benjamin M. Marlin, Nirajan Suri, Shiwei Fang, Mani B. Srivastava, Colin Samplawski, Ziqi Wang, Maggie Wigness</i> | |
| Impact of Delays and Computation Placement on Sense-Act Application Performance in IoT..... | 133 |
| <i>Pragya Sharma, Mani B. Srivastava</i> | |
| Feature Compression for Multimodal Multi-Object Tracking..... | 139 |
| <i>Xinlin Li, Osama A. Hanna, Christina Fragouli, Suhas Diggavi, Gunjan Verma, Joydeep Bhattacharyya</i> | |
| Failure-Resilient ML Inference at the Edge Through Graceful Service Degradation..... | 144 |
| <i>Walid A. Hanafy, Li Wu, Tarek Abdelzaher, Suhas Diggavi, Prashant Shenoy</i> | |
| Unlocking Efficiency: Understanding End-To-End Performance in Distributed Analytics Pipelines..... | 150 |
| <i>Abel Souza, Nathan Ng, Tarek Abdelzaher, Don Towsley, Prashant Shenoy</i> | |
| Challenges and Opportunities in Neuro-Symbolic Composition of Foundation Models | 156 |
| <i>Susmit Jha, Anirban Roy, Adam Cobb, Alexander Berenbeim, Nathaniel D. Bastian</i> | |
| Electrical Grid Anomaly Detection Via Tensor Decomposition | 162 |
| <i>Alexander B. Most, Maksim E. Eren, Boian S. Alexandrov, Nigel Lawrence</i> | |
| Graph Machine Learning Based Cyber Attack Detection for Mobile Tactical Networks..... | 170 |
| <i>Keerthiraj Nagaraj, Dennis Agnew, Pavan K Mangipudi, Allen Starke, Zixiang Nie, Janise McNair</i> | |
| Timely Multi-Goal Transmissions with an Intermittently Failing Sensor | 176 |
| <i>Ismail Cosandal, Sennur Ulukus</i> | |
| Age of Gossip on Generalized Rings | 182 |
| <i>Arunabh Srivastava, Sennur Ulukus</i> | |
| Applying Mission Information Requirements to Value of Information Middleware..... | 188 |
| <i>James Michaelis, Alessandro Morelli</i> | |

| | |
|--|-----|
| Context-Aware Status Updating: Wireless Scheduling for Maximizing Situational Awareness in Safety-critical Systems | 194 |
| <i>Tasmeen Zaman Ornee, Md Kamran Chowdhury Shisher, Clement Kam, Yin Sun</i> | |
| Dynamically Creating Tactical Network Emulation Scenarios Using Unity and EMANE | 201 |
| <i>Alessandro Amato, Roberto Fronteddu, Niranjan Suri</i> | |
| Autonomous Cyber Defense Agents for NATO: Threat Analysis, Design, and Experimentation | 207 |
| <i>Alexander Velazquez, Roberto Rigolin F. Lopes, Adrien Bécue, Johannes F. Loevenich, Paulo H. L. Rettore, Konrad Wrona</i> | |
| Site-Specific Radio Signal Propagation for Tactical Environments Using 3D Path Tracing..... | 213 |
| <i>Bertram Schütz, Christoph Barz, Paulo H. L. Rettore, Thomas Hänel</i> | |
| IoT in Coalition Federated Operations: Multi-National C2 Integration and Technical Interoperability Experiments | 219 |
| <i>Marco Manso, Fernando Freire, Janusz Furlak, Bárbara Guerra, James Michaelis, Daniel Ota, Reinhard Claus, Niranjan Suri, Roberto Fronteddu, Edoardo Di Caro, Konrad Wrona, Emil P. Andersen, Frank T. Johnsen</i> | |
| Live Demonstration of Spectrum Maximization and Encryption Techniques for 5G and Wideband NFC Applications | 225 |
| <i>Scott R. Velazquez, Robert Shanafelt, Brennan Eveland</i> | |
| Demonstration of 5G-Underlay Signal Co-existence | 227 |
| <i>Kumar Sai Bondada, Xiang Cheng, Hanchao Yang, Daniel J. Jakubisin, Nishith Tripathi, Gus Anderson, Yaling Yang, Jeffrey H. Reed</i> | |
| Multi-Waveform Bridging of Streaming Video with an Innovative Software Radio | 233 |
| <i>Roman Shikula, Nicholas Echeverry, William Stevens</i> | |
| Demoing the RFRL Gym: A Reinforcement Learning Testbed for Wireless Communications..... | 235 |
| <i>Alyse M. Jones, Amos Johnson, William C. Headley</i> | |
| Validating a Modified JSON Web Signature Format Using the Scenario of Ammunition Issuance for Training Purposes | 237 |
| <i>Michael Hofmeier, Karl Seidenfad, Wolfgang Hommel</i> | |
| Seeing Without Alarming Thief: Passive WiFi Sensing for Indoor Security Monitoring..... | 239 |
| <i>Shu-Ying Chang, Hung-Wen Liang, Van-Linh Nguyen, Po-Ching Lin</i> | |
| Demonstration of Closed Loop AI-Driven RAN Controllers Using O-RAN SDR Testbed | 241 |
| <i>Nathan H. Stephenson, Azuka J. Chiejina, Nathaniel B. Kabigting, Vijay K. Shah</i> | |
| Adaptive Beam Management for Secure mmWave Communications Using Software-Defined Radios..... | 243 |
| <i>Adrian Baron-Hyppolite, Jefferson V. F. Abreu, Joao F. Santos, Luiz A. DaSilva, Jacek Kibilda</i> | |
| BeamArmor Demo: Anti-Jamming System in Cellular Networks with srsRAN Software Radios | 245 |
| <i>Frederik Jonathan Zumegen, Ish Kumar Jain, Dinesh Bharadia</i> | |
| Demonstration of Joint SDR/UAV Experiment Development in AERPAW..... | 247 |
| <i>Anil Gürses, Mark Funderburk, John Kesler, Keith Powell, Talha F. Rahman, Özgür Özdemir, Magreth Mushi, Mihail L. Sichitiu, Ismail Güvenç, Rudra Dutta, Vuk Marojevic</i> | |

| | |
|--|-----|
| Interference-Avoiding RFSoC-based MIMO Links | 249 |
| <i>Amir Torabi, George Sklivanitis, Dimitris A. Pados, Elizabeth Serena Bentley, Joseph Suprenant, Michael J. Medley</i> | |
| Demo: SSxApp: Secure Slicing for O-RAN Deployments | 251 |
| <i>Joshua Moore, Aly Sabri Abdalla, Minglong Zhang, Vuk Marojevic</i> | |
| End-To-End O-RAN Control-Loop for Radio Resource Allocation in SDR-Based 5G Network | 253 |
| <i>Asheesh Tripathi, Jaswanth S R Mallu, Md. Habibur Rahman, Abida Sultana, Aditya Sathish, Alexandre Huff, Mayukh Roy Chowdhury, Aloizio Pereira Da Silva</i> | |
| Optimization and Control of Autonomous UAV Swarm for Object Tracking | 255 |
| <i>Anand Mahesh Kumar, Mai A. Abdel-Malek, Jeffery Reed</i> | |
| Human Centered Explainable AI Framework for Military Cyber Operations | 260 |
| <i>Clara Maathuis</i> | |
| Neurosymbolic AI in Cybersecurity: Bridging Pattern Recognition and Symbolic Reasoning..... | 268 |
| <i>Brian Jalaian, Nathaniel D. Bastian</i> | |
| Design SNR Optimization of Polar Codes Over Block Rician Fading Channels..... | 274 |
| <i>Hidetake Matsui, Toshiki Matsumine, Hideki Ochiai</i> | |
| Warping Functions Design for Long Warped ZT-DFT-s-OFDM..... | 280 |
| <i>Mostafa Ibrahim, Sabit Ekin, Ali Riza Ekti</i> | |
| Deep Unfolded Superposition Coding Optimization for Two-Hop NOMA MANETs..... | 286 |
| <i>Tomer Alter, Nir Shlezinger</i> | |
| Distributed Space-Time Block Coding for Barrage Relay Networks | 292 |
| <i>Ki-Hun Lee, Howon Lee, Jungwook Choi, Soobum Park, Bang Chul Jung</i> | |
| Enhanced Non-Preemptive Support of URLLC Using Spread Spectrum Underlay Signalling | 298 |
| <i>Kumar Sai Bondada, Hanchao Yang, Xiang Cheng, Daniel J. Jakubisin, Nishith Tripathi, Gus Anderson, Yaling Yang, Jeffrey H. Reed</i> | |
| Underlay-Based 5G Sidelink with Co-channel Interference Cancellation | 304 |
| <i>Hanchao Yang, Kumar Sai Bondada, Xiang Cheng, Daniel J. Jakubisin, Nishith Tripathi, Yaling Yang, Gustave Anderson, Jeffrey H. Reed</i> | |
| Covert Communications in Cognitive Mobile Edge Computing Networks Using Restless Multi-Armed Bandits..... | 311 |
| <i>X. Liu, B. Lorenzo, D. Goeckel</i> | |
| Constant Scaling Asymptotics of Communication Bounds in Covert Channels Against Selective Adversary | 319 |
| <i>Xinchun Yu, Shuangqin Wei, Chenhao Ying, Xiao-Ping Zhang</i> | |
| CAFNet: Compressed Autoencoder-Based Federated Network for Anomaly Detection | 325 |
| <i>Abu Saleh Md Tayeen, Satyajayant Misra, Huiping Cao, Jayashree Harikumar</i> | |
| MINDFL: Mitigating the Impact of Imbalanced and Noisy-Labeled Data in Federated Learning with Quality and Fairness-Aware Client Selection..... | 331 |
| <i>Chaoyu Zhang, Ning Wang, Shanghao Shi, Changlai Du, Wenjing Lou, Y. Thomas Hou</i> | |
| Wireless Federated k-Means Clustering with Non-coherent Over-the-Air Computation..... | 339 |
| <i>Alphan Sahin</i> | |

| | |
|--|-----|
| FLNET2023: Realistic Network Intrusion Detection Dataset for Federated Learning | 345 |
| <i>Pratyay Kumar, Jiefei Liu, Abu Saleh Md Tayeen, Satyajayant Misra, Huiping Cao, Jayashree Harikumar, Oscar Perez</i> | |
| Analysis and Optimization of Anti-Jamming Performance of User Terminals with Low Sidelobe Levels for LEO Satellite Systems..... | 351 |
| <i>Huadong Guo, Weiqing Huang, Wen Wang, Meng Zhang, Zhaohua Qiu, Jinglong Guo</i> | |
| Hybrid Geometric/Shortest-Path Routing in Proliferated Low-Earth-Orbit Satellite Networks | 357 |
| <i>Thomas Shake</i> | |
| Blind Geolocation of RF-Signals with LEO Satellite Formations..... | 365 |
| <i>Daniel Weinzierl, Christian A. Hofmann, Andreas Knopp</i> | |
| Satellite Communications Resilience – Service Restoration and Retainment..... | 371 |
| <i>Richard L. Gobbi, Elsa Schaefer, Jabril Jacobs, Dow Street</i> | |
| CNN-Based Emitter ID-Verification and Rogue Emitter Rejection for IoT Networks Using Entropy-Informed RF-DNA Fingerprints | 377 |
| <i>Awab A. H. Mohammed, Mohamed A. Taha, Joshua H. Tyler, Mohamed K. M. Fadul, Donald R. Reising, T. Daniel Loveless</i> | |
| Adversarial Attacks on LoRa Device Identification and Rogue Signal Detection with Deep Learning | 385 |
| <i>Yalin E. Sagduyu, Tugba Erpek</i> | |
| MCRFF: A Meta-Contrastive Learning-Based RF Fingerprinting Method..... | 391 |
| <i>Mengqi Zhan, Yang Li, Huajun Cui, Bo Li, Jinchao Zhang, Chuanrong Li, Weiping Wang</i> | |
| Searchlight: An Accurate, Sensitive, and Fast Radio Frequency Energy Detection System | 397 |
| <i>Richard Bell, Kyle Watson, Tianyi Hu, Isamu Poy, Fred Harris, Dinesh Bharadia</i> | |
| An Interoperable Zero Trust Federated Architecture for Tactical Systems..... | 405 |
| <i>Alexandre Poirrier, Laurent Cailleux, Thomas Heide Clausen</i> | |
| Cooperative Agent System for Quantifying Link Robustness in Tactical Networks | 411 |
| <i>Johannes F. Loevenich, Philipp Zißner, Paulo H. L. Rettore, Jonas Bode, Tobias Hürten, Thorsten Lampe, Roberto Rigolin F. Lopes</i> | |
| Zero-Shot Dynamic Neural Network Adaptation in Tactical Wireless Systems..... | 418 |
| <i>Shahriar Rifat, Jonathan Ashdown, Kurt Turck, Francesco Restuccia</i> | |
| Learning to Sail Dynamic Networks: The MARLIN Reinforcement Learning Framework for Congestion Control in Tactical Environments | 424 |
| <i>Raffaele Galliera, Mattia Zaccarini, Alessandro Morelli, Roberto Fronteddu, Filippo Poltronieri, Nirajan Suri, Mauro Tortonesi</i> | |
| Online Reduction of Exploration Space for Automated Underwater Modem Optimization | 430 |
| <i>Marcel Rieß, Steffen Moser, Frank Slomka</i> | |
| In-Band Full-Duplex Free-Space Optical Transceiver Design for Flying Platforms..... | 438 |
| <i>Md Sarwar Uddin Chowdhury, Murat Yuksel</i> | |
| Reliable Communication in a Multi-Transceiver Mobile Optical Wireless Network..... | 444 |
| <i>Riley Gartrell, Ryan Black, Kyle Bush, Mahmudur Khan, James Moscola, Josh Gilbert</i> | |

| | |
|--|-----|
| Joint Jamming Alleviation for Mixed RF/FSO Relay Networks: Optimization and Learning Approaches..... | 450 |
| <i>Van Hau Le, Ti Ti Nguyen, Kim Khoa Nguyen, Verdier Assoume, Satinder Singh</i> | |
| Increasing the Supportable Number of WGS Users | 456 |
| <i>Roy Axford, Jason Duchez</i> | |
| Learning Technique to Solve Periodic Markov Decision Process for Network Resource Allocation | 464 |
| <i>Zheyu Chen, Kin K. Leung, Shiqiang Wang, Leandros Tassiulas, Kevin Chan, Patrick J. Baker</i> | |
| Platform Management System Host-Based Anomaly Detection Using TF-IDF and an LSTM Autoencoder | 471 |
| <i>Emilie Coote, Brian Lachine</i> | |
| Online Learning Meets Semantic Communication Over Wireless Channels | 478 |
| <i>Jiarui Xu, Usama Saeed, Jonathan Ashdown, Lingjia Liu</i> | |
| Learning the Jointly Optimal Routing and Controller Placement Policy in Mobile Software-Defined Networks | 484 |
| <i>Iordanis Koutsopoulos</i> | |
| Improving Robustness and Reducing Control Overhead Via Dynamic Clustering in Tactical SDN..... | 491 |
| <i>Philipp Zißner, Paulo H. L. Rettore, Bruno P. Santos, Roberto Rigolin F. Lopes, Johannes F. Loevenich, Peter Sevenich</i> | |
| Dominant Network Slices..... | 497 |
| <i>Bradley R. Smith</i> | |
| Detection of Cyberattacks in an Software-Defined UAV Relay Network | 504 |
| <i>Dennis Agnew, Alvaro Del Aguila, Janise McNair</i> | |
| Chip-Interleaved DSSS for Energy-Efficient Physical Layer Encryption | 510 |
| <i>Clément Leroy, Tarak Arbi, Oudomsack Pierre Pasquero, Benoit Geller</i> | |
| DSSS Chip-Wise Faster-than-Nyquist Signaling with DPSK for Robust Carrier Synchronization | 516 |
| <i>Damien Roque, Stéphanie Bidon, Charly Poulliat</i> | |
| Power and Second Order Cyclic Covertness of Chip-Wise Direct Sequence Spread Spectrum Faster-Than-Nyquist Signaling..... | 522 |
| <i>Jean-Baptiste Fraisse, Pascal Chevalier, Roland Gautier, François Delaveau, Sylvain Traverso</i> | |
| Evaluating the Practical Range of Harmonic Radar to Detect Smart Electronics | 528 |
| <i>Beatrice Perez, Cesar Arguello, Timothy J. Pierson, Gregory Mazzaro, David Kotz</i> | |
| Characterizing the Modification Space of Signature IDS Rules..... | 536 |
| <i>Ryan Guide, Eric Pauley, Yohan Beugin, Ryan Sheatsley, Patrick McDaniel</i> | |
| Adaptive Feature Engineering Via Attention-Based LSTM Towards High Performance Reconnaissance Attack Detection..... | 542 |
| <i>Hamidah Alanazi, Shengping Bi, Tao Wang, Tao Hou</i> | |
| Transient Modeling of Topology-Based Worms in Networks with Link Interference..... | 548 |
| <i>Adrian E. Conway, Era Vuksani, Kevin Wright, M. Patrick Collins</i> | |

| | |
|--|-----|
| SmiLe Net: A Supervised Graph Embedding-Based Machine Learning Approach for NextG Vulnerability Detection | 554 |
| <i>Yifeng Peng, Jingda Yang, Sudhanshu Arya, Ying Wang</i> | |
| Novel Nonlinear Neural-Network Layers for High Performance and Generalization in Modulation-Recognition Applications..... | 562 |
| <i>John A. Snoap, Dimitrie C. Popescu, Chad M. Spooner</i> | |
| Towards Scalable Automatic Modulation Classification Via Meta-Learning..... | 568 |
| <i>Jungik Jang, Jisung Pyo, Young-Il Yoon, Sang Yong Seo, Eun Jae Lee, Gyeong Hun Jung, Jaehyuk Choi</i> | |
| Deep Learning-Based Demodulation in Impulse Noise Channels..... | 574 |
| <i>Andreas Andersson, Kristoffer Hägglund, Erik Axell</i> | |
| Waveform Manipulation Against DNN-Based Modulation Classification Attacks..... | 580 |
| <i>Dimitrios Varkatzas, Antonios Argyriou</i> | |
| Deep Learning Based Fast and Accurate Beamforming for Millimeter-Wave Systems..... | 586 |
| <i>Tarun S. Cousik, Vijay K Shah, Jeffrey H Reed, Harry X Tran, Rittwik Jana</i> | |
| Secure Line-Of-Sight Communications: Optimal Antenna Selection and Beamforming Design | 593 |
| <i>Zhenqiao Cheng, Nanxi Li, Jianchi Zhu, Xiaoming She, Chongjun Ouyang, Peng Chen</i> | |
| ATIC: Automated Testbed for Interference Testing in Communication Systems | 599 |
| <i>Michelle Pirrone, M. Keith Forsyth, Jordan Bernhardt, Daniel Kuester, Aric Sanders, Duncan McGillivray, Adam Wunderlich</i> | |
| On Reliability of CBRS Communications Near U.S. Navy Installations in San Diego | 605 |
| <i>Abhishek Chakraborty, Ramesh R. Rao</i> | |
| Multi-Band Control Channel Architecture (MICCA): Mass Reconfiguration Protocol Design and Implementation Update | 611 |
| <i>Mark D. Silvius, Mark A. McHenry, Alex Lackpour, Joe Molnar</i> | |
| Analysis of Full-Duplex Radios with Transceiver Phase Noise on Spectrum-Tight Battlefields | 617 |
| <i>Changqing Song, Yuxi Zhou, Hongzhi Zhao, Shihai Shao</i> | |
| A Method of Estimating Sparse and Doubly-Dispersive Channels | 622 |
| <i>Brandon T. Hunt, David B. Haab, Hussein Moradi, Behrouz Farhang-Boroujeny</i> | |
| Turbo-VBI Based Off-Grid Channel Estimation for OTFS Systems with 2D-Clustered Sparsity | 629 |
| <i>Yuejin Ding, Ming Lei, Ming-Min Zhao, Min-Jian Zhao</i> | |
| Expected Probability of Radiometric Detection by Channelized Radiometer..... | 635 |
| <i>Kyle Watters, Edward J. Coyle</i> | |
| Separating Interferers from Multiple Users in Interference Aware Guessing Random Additive Noise Decoding Aided Macrosymbol..... | 643 |
| <i>Kathleen Yang, Muriel Médard, Ken R. Duffy</i> | |
| Enhanced and Explainable Deep Learning-Based Intrusion Detection in IoT Networks..... | 649 |
| <i>Sohan Gyawali, Kamran Sartipi, Benjamin Van Ravesteyn, Jiaqi Huang, Yili Jiang</i> | |
| Neural SDEs for Robust and Explainable Analysis of Electromagnetic Unintended Radiated Emissions | 655 |
| <i>Sumit Kumar Jha, Susmit Jha, Rickard Ewetz, Alvaro Velasquez</i> | |

| | |
|--|-----|
| Learnable Digital Twin for Efficient Wireless Network Evaluation | 661 |
| <i>Boning Li, Timofey Efimov, Abhishek Kumar, Jose Cortes, Gunjan Verma, Ananthram Swami, Santiago Segarra</i> | |
| Towards Explainable Machine Learning: The Effectiveness of Reservoir Computing in Wireless Receive Processing | 667 |
| <i>Shashank Jere, Karim Said, Lizhong Zheng, Lingjia Liu</i> | |
| Stealth Spectrum Sensing Data Falsification Attacks Affecting IoT Spectrum Monitors on the Battlefield | 673 |
| <i>Pedro Miguel Sánchez Sánchez, Enrique Tomás Martínez Beltrán, Alberto Huertas Celdrán, Robin Wassink, Gérôme Bovet, Gregorio Martínez Pérez, Burkhard Stiller</i> | |
| Dynamic, Real-Time Analysis, Patching and Protection of Vehicle System Binaries | 679 |
| <i>James Brock, Lauren Provost, Rylee Stone, Stephen Padnos, Stephen Taylor, Jason Dahlstrom</i> | |
| A Practical Perfect Secrecy Approach for IoBT Systems | 685 |
| <i>Mohammad Moltafet, Hamid R. Sadjadpour, Zouheir Rezki</i> | |
| Security-As-A-Service for Embedded Systems | 691 |
| <i>Michael Vai, Eric Simpson, Donato Kava, Alice Lee, Huy Nguyen, Jeffrey Hughes, Gabriel Torres, Jeffery Lim, Ben Nahill, Roger Khazan, Fred Schneider</i> | |
| DUBIOUS: Detecting Unknown Backdoored Input by Observing Unusual Signatures | 696 |
| <i>Matthew Yudin, Rauf Izmailov</i> | |
| An Improved Nested Training Approach to Mitigate Clean-Label Attacks Against Malware Classifiers | 703 |
| <i>Achyut Reddy, Sridhar Venkatesan, Rauf Izmailov, Alina Oprea</i> | |
| Adversarial Pixel and Patch Detection Using Attribution Analysis | 710 |
| <i>Chase Walker, Dominic Simon, Sumit Kumar Jha, Rickard Ewetz</i> | |
| Do Programs Dream of Electromagnetic Signals? Towards GAN-Based Code-to-Signal Synthesis | 716 |
| <i>Kurt A. Vedros, Constantinos Kolias, Robert C. Ivans</i> | |
| Towards Effective Swarm-Based GPS Spoofing Detection in Disadvantaged Platforms | 722 |
| <i>Enguang Fan, Anfeng Peng, Matthew Caesar, Jae Kim, Josh Eckhardt, Greg Kimberly, Denis Osipychev</i> | |
| Passive Geolocation of Multiple Pulsed Emitters | 729 |
| <i>Kevin Joe</i> | |
| Machine Learning Based Node Selection for UWB Network Localization | 735 |
| <i>Carlos A. Gómez-Vega, Moe Z. Win, Andrea Conti</i> | |
| LibDI: A Direction Identification Framework for Detecting Complex Reuse Relationships in Binaries | 741 |
| <i>Siyuan Li, Chaopeng Dong, Yongpan Wang, Wenming Liu, Weijie Wang, Hong Li, Hongsong Zhu, Limin Sun</i> | |
| Age of Critical Information: Optimizing Data Freshness Based on Content Criticality | 747 |
| <i>Qingyu Liu, Chengzhang Li, Y. Thomas Hou, Wenjing Lou, Sastry Komella</i> | |
| Urgency of Information Optimization at Query in an Interactive System | 755 |
| <i>Zhuoxuan Ju, Miloš Doroslovacki</i> | |

| | |
|---|-----|
| Modeling and Generation of Realistic Network Activity | 761 |
| <i>Stefan Tschimben, Isabella Bates, James H. Curry, Keith D. Gremban, Alexandra Siegel</i> | |
| Low-Delay Proactive Mechanisms for Resilient Communication | 767 |
| <i>Mine Gokce Dogan, Martina Cardone, Christina Fragouli</i> | |
| An Approach to Tactical Network Performance Analysis with In-Band Network Telemetry and Programmable Data Planes..... | 773 |
| <i>Robert Starr, Matt Steele, Jonathon Cheah</i> | |
| Revisiting the OLSRv2 Protocol Optimization in SDN-Enabled Tactical MANETs | 779 |
| <i>Ioannis Fourfouris, Merkouris Karaliopoulos, Dimitrios Kafetzis, Georgios Vardoulias, Apostolos Georgiadis, Spyridon Vassilaras, Iordanis Koutsopoulos</i> | |
| Efficient Link-State Multicast Routing by Optimizing Link-Weight with MARL..... | 787 |
| <i>Do Dang, Kim Khoa Nguyen, Verdier Assoume Mbai, Satinder Singh</i> | |
| Thwarting Adversarial Network Reconnaissance Through Vulnerability Scan Denial and Deception with Data Plane Programming and P4..... | 793 |
| <i>Sean Ha, Gavin Smith, Robert Starr</i> | |
| Sidelink Mode 2 Operations in Unlicensed Bands: Design Challenges and Potential Approaches..... | 799 |
| <i>Vijitha Weerackody, Sumit Roy, Kent Benson, Eric Yang</i> | |
| System-Level Evaluation of 5G NR UE-Based Relays..... | 807 |
| <i>Samantha Gamboa, Aziza Ben Mosbah, Wesley Garey, Chunmei Liu, Richard Rouil</i> | |
| Securing NextG Systems Against Poisoning Attacks on Federated Learning: A Game-Theoretic Solution | 815 |
| <i>Yalin E. Sagduyu, Tugba Erpek, Yi Shi</i> | |
| MMLSnet: Multilevel Security Network with Mobility..... | 821 |
| <i>Mingli Yu, Quinn K. Burke, Thomas La Porta, Patrick McDaniel</i> | |
| Dynamic Interference-Avoiding MIMO Links..... | 827 |
| <i>Sanaz Naderi, Dimitris A. Pados, George Sklivanitis, Elizabeth Serena Bentley, Joseph Suprenant, Michael J. Medley</i> | |
| Second-Order Analysis of Secret-Key Capacity from a MIMO Channel..... | 833 |
| <i>Ahmed Maksud, Yingbo Hua</i> | |
| Experimental Evaluation of AoA Estimation for UAV to Massive MIMO | 839 |
| <i>Tarence Rice, Divyanshu Pandey, David Ramirez, Edward Knightly</i> | |
| Secure Beamforming in DLA-Based CAP-MIMO | 845 |
| <i>Zhenqiao Cheng, Nanxi Li, Jianchi Zhu, Xiaoming She, Chongjun Ouyang, Peng Chen</i> | |
| Majority Vote Computation with Complementary Sequences for Distributed UAV Guidance | 852 |
| <i>Alphan Sahin, Xiaofeng Wang</i> | |
| Hybrid Multi-Agent Deep Reinforcement Learning for Active-IRS-Based Rate Maximization Over 6G UAV Mobile Wireless Networks | 858 |
| <i>Shuming Yi, Fei Wang, Xi Zhang</i> | |
| On the Secrecy Performance of Aerial IRS-Assisted Wireless Communications..... | 864 |
| <i>Xiaolei Guo, Shunliang Zhang</i> | |

| | |
|---|-----|
| Enhancing Real-Time Training of Heterogeneous UAVs Using a Federated Teacher-Student Self-Training Framework | 870 |
| <i>Piyush Nikam, Dhruv Shah, Aryan Sahu, Neena Goveas, Sreejith Vidhyadharan</i> | |
| TISIN: Traceable Information Sharing in Intermittent Networks..... | 876 |
| <i>Wenyi Tang, Taeho Jung, E. Paul Ratazzi</i> | |
| BIER-Like Multicast for Mobile Ad Hoc Networks | 882 |
| <i>Matteo Varvello, Fang Hao, David Holland, James M. Hughes, Sarit Mukherjee</i> | |
| Characterizing the Performance of Distributed Edge Processing Resource Allocation in Dynamic Networked Environments | 888 |
| <i>Olena Tkachenko, Sean Harding, Cleon Anderson, Jake Perazzone, Matthew Dwyer, Kevin Chan</i> | |
| Where to Deploy an Airborne Relay in Unknown Environments: Feasible Locations for Throughput and LoS Enhancement | 894 |
| <i>Juan David Pabon, Matthew C. Valenti, Xi Yu West</i> | |
| Implementing Jamming Detection on FPGA: An Accelerated Forward Consecutive Mean Excision Approach | 901 |
| <i>Song Ma, Xiaonan Chen, Jingzhou Wang, Jun Wang, Xueying Li, Shengtang Zhou, Yading Chen, Qihang Peng</i> | |
| Persistent Throughput-Optimal Scheduling for Smart Jamming Resiliency | 907 |
| <i>Maya Flores, Thomas Stahlbuhk, Alexander M. Wyglinski</i> | |
| Tradespace Performance Study of Polarization-Insensitive Spatial Filtering for Jamming Suppression | 913 |
| <i>John N. Spitzmiller</i> | |
| Detection and Classification of Smart Jamming in Wi-Fi Networks Using Machine Learning | 919 |
| <i>Zhengguang Zhang, Marwan Krunz</i> | |
| Generalizing Machine Learning Models for Zero-Day Encrypted Messaging Applications..... | 925 |
| <i>Jason Hussey, Kerri Stone, Tracy Camp</i> | |
| A Conditional Analysis of RF ML Latent Features | 931 |
| <i>Scott Kuzdeba, Josh Robinson</i> | |
| Input Output Grammar Coverage in Fuzzing | 937 |
| <i>Andrew Fryer, Thomas Dean, Brian Lachine</i> | |
| Counterexample Guided Inductive Synthesis Using Large Language Models and Satisfiability Solving | 944 |
| <i>Sumit Kumar Jha, Susmit Jha, Patrick Lincoln, Nathaniel D. Bastian, Alvaro Velasquez, Rickard Ewetz, Sandeep Neema</i> | |
| Time-Diverse Doppler-only LEO PNT | 950 |
| <i>Megan O. Moore, R. Michael Buehrer, William C. Headley</i> | |
| Fairness-Aware Scheduling Optimization for NB-IoT in LEO Satellite Networks Using a 3D Spherical Coordinate System..... | 957 |
| <i>Byeongheon Lee, Ju-Hyung Lee, Young-Chai Ko</i> | |

| | |
|---|-----|
| Non-Terrestrial Network (NTN): A Novel Alternate Fractional Programming for the Downlink Channels Power Allocation | 963 |
| <i>Mahfuzur Rahman, Zoheb Hassan, Jeffrey H. Reed, Lingjia Liu</i> | |

Author Index