

IEEE TRANSACTIONS ON VEHICULAR TECHNOLOGY

A PUBLICATION OF THE IEEE VEHICULAR TECHNOLOGY SOCIETY

MARCH 2022

VOLUME 71

NUMBER 3

ITVTAB

(ISSN 0018-9545)

EDITORIAL

Welcome Message From the New Editor-in-Chief.....A. Jamalipour 2227

REGULAR PAPERS

Channel Modeling

Stochastic Fading Channel Models With Multiple Dominant Specular Components J. M. Romero-Jerez, F. J. Lopez-Martinez, J. P. Peña-Martín, and A. Abdi 2229

Infrastructure-to-Vehicle Visible Light Communications: Channel Modelling and Performance Analysis H. B. Eldeeb, M. Elamassie, S. M. Sait, and M. Uysal 2240

A 3D Geometry-Based THz Channel Model for 6G Ultra Massive MIMO Systems Y. Yuan, R. He, B. Ai, Z. Ma, Y. Miao, Y. Niu, J. Zhang, R. Chen, and Z. Zhong 2251

Communication Circuits & Systems

Feasible Dispatch Limits of PV Generation With Uncertain Interconnection of EVs in the Unbalanced Distribution Network M. R. Feizi, M. E. Khodayar, and B. Chen 2267

Few-Shot Learning for Fine-Grained Signal Modulation Recognition Based on Foreground Segmentation Z. Zhang, Y. Li, Q. Zhai, Y. Li, and M. Gao 2281

Optimal Multi-Tier Clustering of Permissioned Blockchain Systems for IoT J. Mišić, V. B. Mišić, and X. Chang 2293

Hybrid RFID Based Batteryless Seat Sensor With Discontinuous RF Transmission S. Mondal, Y. Chu, M. Cuddihy, A. Attaran, M. Y. Ghannam, and P. Chahal 2305

Connected Vehicles

Safety of Automatic Emergency Braking in Platooning G. Sidorenko, J. Thunberg, K. Sjöberg, A. Fedorov, and A. Vinel 2319

Reconfigurable Intelligent Surface Enabled Vehicular Communication: Joint User Scheduling and Passive Beamforming A. Al-Hilo, M. Samir, M. Elhattab, C. Assi, and S. Sharafeddine 2333

Transportation and Autonomous Vehicles

Adaptive Equivalent Consumption Minimization Strategy for Off-Road Hydraulic Hybrid Vehicles: A Cycle-to-Cycle Optimization Approach Q. Wen, F. Wang, M. Cheng, B. Xu, and Z. Sun 2346

Autonomous Pilot of Unmanned Surface Vehicles: Bridging Path Planning and Tracking N. Wang, Y. Zhang, C. K. Ahn, and Q. Xu 2358

Fundamentals of Motion Planning for Mitigating Motion Sickness in Automated Vehicles Z. Htike, G. Papaioannou, E. Siampis, E. Velenis, and S. Longo 2375

Homography-Based Visual Servoing for Underactuated VTOL UAVs Tracking a 6-DOF Moving Ship Y. Huang, M. Zhu, Z. Zheng, and K. H. Low 2385

A Generative Adversarial Network Based Learning Approach to the Autonomous Decision Making of High-Speed Trains X. Wang, T. Xin, H. Wang, L. Zhu, and D. Cui 2399

Voltage Regulation With Electric Taxi Based on Dynamic Game Strategy K. Ma, X. Hu, Z. Yue, Y. Wang, J. Yang, H. Zhao, and Z. Liu 2413

Electric Taxi Charging Strategy Based on Stackelberg Game Considering Hotspot Information K. Ma, X. Hu, J. Yang, Z. Yue, B. Yang, Z. Liu, and X. Guan 2427

(Contents Continued on Page 2225)

OpenMPD: An Open Multimodal Perception Dataset for Autonomous Driving	2437
..... X. Zhang, Z. Li, Y. Gong, D. Jin, J. Li, L. Wang, Y. Zhu, and H. Liu	
Hybrid Swapped Battery Charging and Logistics Dispatch Model in Continuous Time Domain	2448
..... W. Jia, T. Ding, J. Bai, L. Bai, Y. Yang, and F. Blaabjerg	
A Multi-Intersection Vehicular Cooperative Control Based on End-Edge-Cloud Computing	2459
..... M. Jiang, T. Wu, Z. Wang, Y. Gong, L. Zhang, and R. P. Liu	
ES-DQN: A Learning Method for Vehicle Intelligent Speed Control Strategy Under Uncertain Cut-In Scenario	2472
..... Q. Chen, W. Zhao, L. Li, C. Wang, and F. Chen	
Human-Tailored Data-Driven Control System of Autonomous Vehicles	2485
..... M. Rokonzaman, N. Mohajer, and S. Nahavandi	
High-Accuracy and Adaptive Fault Diagnosis of High-Speed Train Bogie Using Dense-Squeeze Network	2501
..... Y. Zhang, N. Qin, D. Huang, B. Wu, and Z. Liu	
Bio-Inspired Collision Avoidance in Swarm Systems via Deep Reinforcement Learning	2511
..... S. Na, H. Niu, B. Lennox, and F. Arvin	
Event-Triggered Sensor Fault Estimation of Unreliable Networked Unmanned Surface Vehicle System With Correlated Noises	2527
..... K. Zhu and Y. Wang	
<i>Vehicular Electronics</i>	
Adaptive Equivalent Consumption Minimization Strategy (A-ECMS) for the HEVs With a Near-Optimal Equivalent Factor Considering Driving Conditions	2538
..... K. Choi, J. Byun, S. Lee, and I. G. Jang	
Coordinated Attitude Control of Longitudinal, Lateral and Vertical Tyre Forces for Electric Vehicles Based on Model Predictive Control	2550
..... H. Zhao, X. Lu, H. Chen, Q. Liu, and B. Gao	
Design and Optimization of Asymmetric and Reverse Series Coil Structure for Obtaining Quasi-Constant Mutual Inductance in Dynamic Wireless Charging System for Electric Vehicles	2560
..... Z. Li, J. Li, S. Li, Y. Yu, and J. Yi	
A Coupling Thermal Management Strategy Based on Fuzzy Control for a Range Extended Electric Vehicle Power System	2573
..... K. Li, Q. Liu, Y. Hu, J. Gao, and H. Chen	
A C-Band Fully Polarimetric Automotive Synthetic Aperture Radar	2587
..... J. M. Merlo and J. A. Nanzer	
An Integrated Method of the Future Capacity and RUL Prediction for Lithium-Ion Battery Pack	2601
..... C. Zhang, S. Zhao, and Y. He	
A Multi-Sensor Fusion Positioning Strategy for Intelligent Vehicles Using Global Pose Graph Optimization	2614
..... X. Tao, B. Zhu, S. Xuan, J. Zhao, H. Jiang, J. Du, and W. Deng	
A General Polynomial Reverse Design of Step-Up Converters for EV Battery Applications	2628
..... G. Zhang, S. S. Yu, W. Chen, B. Zhang, and Y. Zhang	
Integrated Velocity Prediction Method and Application in Vehicle-Environment Cooperative Control Based on Internet of Vehicles	2639
..... Y. Zhang, Z. Chen, G. Li, Y. Liu, Y. Huang, G. Cunningham, and J. Early	
Bayesian Detection in Gaussian Clutter for FDA-MIMO Radar	2655
..... B. Huang, W.-Q. Wang, A. Basit, and R. Gui	
MPC-Based Integrated Control of Trajectory Tracking and Handling Stability for Intelligent Driving Vehicle Driven by Four Hub Motor	2668
..... L. Zhai, C. Wang, Y. Hou, and C. Liu	
Optimal Design of 9-Phase Permanent Magnet Synchronous Generator With Low Voltage Change Rate for Diesel Railway Vehicles	2681
..... L. Kang and Y. Chen	
Design Methodology Based on Dual Control of a Resonant Dual Active Bridge Converter for Electric Vehicle Battery Charging	2691
..... A. V. Mirtchev and E. C. Tatakis	
Shared Control for Intelligent Vehicle Based on Handling Inverse Dynamics and Driving Intention	2706
..... H. Deng, Y. Zhao, S. Feng, Q. Wang, and F. Lin	
Multi-Actuation Controller for Performance Vehicles: Optimal Torque Allocation and Active Aerodynamic	2721
..... S. Mashrouteh, A. Khajepour, A. Kasaiezadeh, E. Esmailzadeh, S.-K. Chen, and B. Litkouhi	
A Dynamic Rollover Prediction Index of Heavy-Duty Vehicles With a Real-Time Parameter Estimation Algorithm Using NLMS Method	2734
..... X. Yang, C. Wu, Y. He, X.-Y. Lu, and T. Chen	
<i>Wireless Communications</i>	
Broadcast Encryption Scheme for V2I Communication in VANETs	2749
..... H. Zhong, S. Zhang, J. Cui, L. Wei, and L. Liu	
Intelligent Reflecting Surface Aided Secure Communications for NOMA Networks	2761
..... C. Gong, X. Yue, X. Wang, X. Dai, R. Zou, and M. Essaadi	
Leveraging Blockchain for Multi-Operator Access Sharing Management in Internet of Vehicles	2774
..... D. Hu, J. Chen, H. Zhou, K. Yu, B. Qian, and W. Xu	
Wireless Network Reliability Analysis for Arbitrary Network Topologies	2788
..... S. T. Basaran, G. K. Kurt, and F. R. Kschischang	

Transmit Antenna Number Identification for MIMO Cognitive Radio Systems in the Presence of Alpha-Stable Noise	J. Zhang, N. Zhao, M. Liu, Y. Chen, F. Gong, Q. Yang, and F. R. Yu	2798
Low-Band Information and Historical Data Aided Non-Uniform Millimeter Wave Beam Selection Algorithm in 5G-R High-Speed Railway Communication Scene	T. Li, Y. Xu, H. Tong, and K. Pang	2809
Efficient Joint Estimation of DOA, Range and Reflectivity in Near-Field by Using Mixed-Order Statistics and a Symmetric MIMO Array	A. M. Molaei, P. del Hougne, V. Fusco, and O. Yurduseven	2824
Online Control of Traffic Split and Distributed Cell Group State Decisions for Multi-Connectivity in 5G and Beyond	S. H. Jung and S. Bahk	2843
Impact of Primary User Activity Statistics in Cognitive Vehicular Networks	D. K. Patel, S. Kavaiya, Z. Ding, Y. L. Guan, and S. Sun	2859
Design of Improved Expanding-Window BATS Codes	J. Yang, Z. Shi, and J. Ji	2874
Temporal Correlation Enhanced Sparse Activity Detection in MIMO Enabled Grant-Free NOMA	L. Wu, Z. Wang, P. Sun, and Y. Yang	2887
Orientalional Beamforming via a Modified RBF Neural Network for Orientalional UWB Interference Rejection	J. Han, B. P. Ng, and M. H. Er	2900
Performance Analysis of the Hybrid Satellite-Terrestrial Relay Network With Opportunistic Scheduling Over Generalized Fading Channels	Z. Zhao, G. Xu, N. Zhang, and Q. Zhang	2914
Exploitation of Channel-Learning for Enhancing 5G Blind Beam Index Detection	J. Y. Han, O. Jo, and J. Kim	2925
An Adaptive Vehicle Clustering Algorithm Based on Power Minimization in Vehicular Ad-Hoc Networks	H. Zhao, J. Tang, B. Adebisi, T. Ohtsuki, G. Gui, and H. Zhu	2939
Precoder Design for Physical-Layer Security and Authentication in Massive MIMO UAV Communications	S. J. Maeng, Y. Yapıcı, İ. Güvenç, A. Bhuyan, and H. Dai	2949
Energy Efficient Resource Allocation for MSCA Enabled CoMP in HetNets	J. Chen, Z. Ma, Y. Liu, J. Jia, and X. Wang	2965
LIDAR and Position-Aided mmWave Beam Selection With Non-Local CNNs and Curriculum Training	M. Zecchin, M. B. Mashhadi, M. Jankowski, D. Gündüz, M. Kountouris, and D. Gesbert	2979
Complementary Coded CDMA With Multi-Layer Quadrature Modulation	X. Wang, H.-H. Chen, X. Liu, and Q. Guo	2991
Outage Probability and Ergodic Capacity of Distributed Transmit Beamforming With Imperfect CSI	I. Ahmad, C. K. Sung, D. Kramarev, G. Lechner, H. Suzuki, and I. Grivell	3008
3D-Trajectory and Phase-Shift Design for RIS-Assisted UAV Systems Using Deep Reinforcement Learning	H. Mei, K. Yang, Q. Liu, and K. Wang	3020
Performance Analysis of Opportunistic Beam Splitting NOMA in Millimeter Wave Networks	Y. Zhou and S. Sun	3030
FBMC Receiver Design and Analysis for Medium and Large Scale Antenna Systems	H. Hosseiny, A. Farhang, and B. Farhang-Boroujeny	3044
Maintaining the Status Quo: Simultaneous Estimation and Elimination for Multiple Interference in Transform Domain Vehicular Communication	G. Wang, X. Han, Y. Wang, and S. Dong	3058
Robust Sum-Rate Maximization for Underlay Device-to-Device Communications on Multiple Channels	M. Elnourani, S. Deshmukh, B. Beferull-Lozano, and D. Romero	3075
<i>Wireless Networks</i>		
Cooperative Localization Based Multi-AUV Trajectory Planning for Target Approaching in Anchor-Free Environments	Y. Li, B. Li, W. Yu, S. Zhu, and X. Guan	3092
A Blockchain Based User Subscription Data Management and Access Control Scheme in Mobile Communication Networks	K. Xue, X. Luo, H. Tian, J. Hong, D. S.L. Wei, and J. Li	3108
A QoE-Driven Pricing Scheme for Inter-Vehicular Communications With Four-Stage Stackelberg Game	K. M. K. Ramamoorthy and W. Wang	3121
Joint Cache Placement and Cooperative Multicast Beamforming in Integrated Satellite-Terrestrial Networks	D. Han, W. Liao, H. Peng, H. Wu, W. Wu, and X. Shen	3131
Combined Communication and Computing Resource Scheduling in Sliced 5G Multi-Access Edge Computing Systems	W. K.G. Seah, C.-H. Lee, Y.-D. Lin, and Y.-C. Lai	3144
Optimal Energy Efficiency for Relay Selection via Power Allocation in L2 Halo-Orbital Cislunar Communication Network	A. Yuan, Y. Xu, Q. Zhang, R. Wang, and Z. Yang	3155
Coverage Analysis for UAV-Assisted mmWave Cellular Networks Using Poisson Hole Process	X. Guo, C. Zhang, F. Yu, and H. Chen	3171
A Collaborative Caching-Transmission Method for Heterogeneous Video Services in Cache-Enabled Terahertz Heterogeneous Networks	Q. Li, A. Nayak, X. Wang, D. Wang, and F. R. Yu	3187

Content Distribution Based on Joint V2I and V2V Scheduling in mmWave Vehicular Networks	3201
. <i>L. Su, Y. Niu, Z. Han, B. Ai, R. He, Y. Wang, N. Wang, and X. Su</i>	
User-Number Threshold-Based Base Station On/Off Control for Maximizing Coverage Probability	3214
. <i>J.-H. Noh, B. Lee, and S.-J. Oh</i>	
Learning Algorithms for Complete Targets Coverage in RF-Energy Harvesting Networks	3229
. <i>C. Li, K.-W. Chin, and C. Yang</i>	
The Role of Communication Time in the Convergence of Federated Edge Learning	3241
. <i>Y. Zhou, Y. Fu, Z. Luo, M. Hu, D. Wu, Q. Z. Sheng, and S. Yu</i>	
Quantum-Defended Blockchain-Assisted Data Authentication Protocol for Internet of Vehicles	3255
. <i>D. S. Gupta, A. Karati, W. Saad, and D. B. da Costa</i>	
UAV-Assisted Edge Computing and Streaming for Wireless Virtual Reality: Analysis, Algorithm Design, and Performance Guarantees	3267
. <i>L. Zhang and J. Chakareski</i>	

CORRESPONDENCE

Channel Modeling

| Bivariate Complex α - μ Statistics *T. A. M. de Bairros, P. M. R. Pereira, R. A. A. de Souza, and M. D. Yacoub* | 3276 |

Wireless Communications

RIS-Aided Hybrid Massive MIMO Systems Relying on Adaptive-Resolution ADCs: Robust Beamforming Design and Resource Allocation *Y. Wang, X. Chen, Y. Cai, and L. Hanzo*	3281
Machine-Learning-Aided Link-Performance Prediction for Coded MIMO Systems *T. Van Le and K. Lee*	3287
A Revisit to Chiani's Framework and Identity With Applications to Hoyt Faded MIMO and Beyond *Y. Feng and H. Zhang*	3293
HARQ Under Outdated CSI, Finite-Blocklength Regimes and Generalised-Rician Fading *K. N. Le*	3298
Energy Efficiency Optimization for Compact Massive MIMO Wireless Systems *Y. Zhang, J. Tang, L. Pang, Y. Guo, Y. Chen, and J. Li*	3303
Generalized Approximate Message Passing Equalization for Multi-Carrier Faster-Than-Nyquist Signaling *Y. Ma, N. Wu, J. A. Zhang, B. Li, and L. Hanzo*	3309
Fusion Test Statistics Based Mixture Detector for Spectrum Sensing *X. Luo, W. Zhao, H. Li, M. Jin, and G. Cui*	3315
Sum-Rate Maximization for Intelligent Reflecting Surface Assisted Terahertz Communications *Y. Pan, K. Wang, C. Pan, H. Zhu, and J. Wang*	3320
On the Performance of Distributed Antenna Array Systems With Quasi-Orthogonal Pilots *A. Chowdhury, P. Sasmal, C. R. Murthy, and R. Chopra*	3326
On Some Capacity-Achieving Fractional Repetition Codes *B. Zhu, W. Wang, and J. Wang*	3332
Link-Level Wideband Signal Shaping for Downlink Wireless Information and Energy Provision *Z. Wang, J. Hu, K. Yang, and J. Shen*	3338
Resource Allocation for URLLC-Oriented Two-Way UAV Relaying *Y. Cai, X. Jiang, M. Liu, N. Zhao, Y. Chen, and X. Wang*	3344
Noncoherent Two-Way Relaying With Decode and Forward: Two Versus Three Phases *R.-Y. Wei, W.-Y. Chin, and T.-Y. Feng*	3350
Outage Probability for OTFS Based Downlink LEO Satellite Communication *J. Shi, J. Hu, Y. Yue, X. Xue, W. Liang, and Z. Li*	3355
An ARMA-Filter Based SAGE Algorithm for Ranging in Diffuse Scattering Environment *S. Jiang, W. Wang, T. Jost, P. Peng, and Y. Sun*	3361

Wireless Networks

Adaptive Deadline Determination for Mobile Device Selection in Federated Learning *J. Lee, H. Ko, and S. Pack*	3367
Optimal False Data Injection Attacks on MTC *Y. Du, J. Liu, N. Li, and Y. Zhang*	3372
Spectral-Energy Efficiency Trade-Off Based Design for Hybrid TDMA-NOMA System *X. Wei, H. Al-Obiedollah, K. Cumanan, W. Wang, Z. Ding, and O. A. Dobre*	3377
Joint Offloading and Resource Allocation for Multi-User Multi-Edge Collaborative Computing System *Z. Gao, W. Hao, and S. Yang*	3383
Deep Reinforcement Learning Approach for Joint Trajectory Design in Multi-UAV IoT Networks *S. Xu, X. Zhang, C. Li, D. Wang, and L. Yang*	3389
