2019 IEEE 44th Conference on Local Computer Networks (LCN 2019)

Osnabrueck, Germany 14-17 October 2019



IEEE Catalog Number: CISBN: 9'

CFP19068-POD 978-1-7281-1029-5

Copyright \odot 2019 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:
 CFP19068-POD

 ISBN (Print-On-Demand):
 978-1-7281-1029-5

 ISBN (Online):
 978-1-7281-1028-8

ISSN: 0742-1303

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



2019 IEEE 44th Conference on Local Computer Networks

LCN 2019

Table of Contents

Message from the General Chair	ix
Message from the Program Chairs	X
Message from the Demonstrations Chair	xi
Organizing Committee	xii
Steering Committee	xiii
Technical Program Committee	xiv
List of Accepted Demonstrations	xvi
Sponsors and Supporters	xvii
Best Paper Awards for Prior IEEE Local Computer Networks (LCN) Conferences	xviii
Keynote 1: Dr. Frank Fitzek – "Tactile Internet with Human-In-The-Loop"	XX
Keynote 2: Dr. Javier Sempere – "V2X Networks for Connected and Automated Driving"	xxi
Technical Program	xxii
B1: LCN Plenary 1 – Best Paper Candidates	
TCP at 100Gbit/s Tuning, Limitations, Congestion Control	1
Heavy-Hitter Flow Identification in Data Centre Networks Using Packet Size Distribution and Template Matching	10
Learning Wi-Fi Connection Loss Predictions for Seamless Vertical Handovers Using Multipath TCP	18
2A: IoT and Sensor Networks	
Evaluation of Sigfox LPWAN for Sensor-Enabled Homes to Identify at Risk Community Dwelling Seniors	26
SmartBFA: A Passive Crowdsourcing System for Point-to-Point Barrier-Free Access	34

IEEE 802.15.4 TSCH in Sub-GHz: Design Considerations and Multi-band Support	42
A Preliminary Study of UG2AG Link Quality in LoRa-based Wireless Underground Sensor Networks	51
2B: Security and Privacy I	
Detasyr: Decentralized Ticket-based Authorization with Sybil Resistance	60
High-performance, Platform-Independent DDoS Detection for IoT Ecosystems	69
Blind Synchronization of Channel Impulse Responses for Channel Reciprocity-based Key Generation	76
Map-Z: Exposing the Zeash Network in Times of Transition	84
P1: Poster Session 1	
Combined ARP-Path & RSTP Bridges for Smooth Migration to Robust Shortest Path Bridging	93
Scaling and Interoperability of All-Path with Bridged and SDN Domains Using VXLANs	97
Dynamic Platoon Formation at Urban Intersections	101
QUICker Connection Establishment with Out-Of-Band Validation Tokens	105
An Adaptive Flow-Aware Packet Scheduling Algorithm for Multipath Tunnelling	109
An Attack Behaviors Prediction Model Based on Bag Representation in Time Series	113
A Hybrid Intrusion Detection Algorithm Based on Gaussian Mixture Model and Nearest Neighbors	117
Dynamic Vehicle Path-Planning in the Presence of Traffic Events	121
Prioritize When Patching Everything is Impossible!	125
Network-Assisted D2D Relay Selection Under the Presence of Dynamic Obstacles	129

A Geographical Aware Routing Protocol Using Directional Antennas for NDN-VANETs	133
Blockchain and Structural Relationship Based Access Control for IoT: A Smart City Use Case	137
Strict Judgement of Successful Transfer of Multiple Data and ACK Frames in Interfering Wireless LAN Environments	141
Cooperation Control Between Wireless and Base Stations in Wireless Access Network Consisting of Wireless Networks with Different Coverages	145
Application Level Performance Measurements of Multi-Connectivity Options in Cellular Networks for Vehicular Scenarios	149
SR Domain Partitioning in Segment Routed SDNs	153
Container-based Real-time Video Transcoding	157
3A: IoT and Localization	
Where are You? Localising Stationary Nodes with Limited Information	161
Towards A Realistic Path Planning Evaluation Model for Micro Aerial Vehicle-Assisted Localization of Wi-Fi Nodes	169
Maximizing Joint Data Rate and Resource Efficiency in D2D-IoT Enabled Multi-Tier Networks	177
3B: Software Defined Networks	
A Realistic Evaluation of MRF-based Resource Allocation for SDR Cognitive Radio Networks	185
SPONGE: Software-Defined Traffic Engineering to Absorb Influx of Network Traffic	193
LatencySmasher: A Software-Defined Networking-Based Framework for End-to-End Latency Optimization	202
P2: Poster Session 2	
Cooperative and Distributive Caching System for Video Streaming Services over the Information Centric Networking	210
Real-Time Video Adaptation in Virtualised 5G Networks	214

Multi-Stream TCP: Leveraging the Performance of a Per-Packet Multipath Routing Algorithm When Using TCP and SDN	218
Modeling and Monitoring Wi-Fi Calling Traffic in Enterprise Networks Using Machine Learning	222
LIoTS: League of IoT Sovereignties. A Scalable Approach for a Transparent Privacy-safe Federation of Secured IoT Platforms	226
Inferring IoT Device Types from Network Behavior Using Unsupervised Clustering	230
DENA: An Intelligent Dynamic Flow Scheduling for Rate Adjustment in Green DCNs	234
Statistical Analysis of Enhanced SDEx Encryption Method Based on SHA-256 Hash Function	238
A Machine Learning Approach for RDP-based Lateral Movement Detection	242
Design of Binocular Active Free Space Optics Transmission Apparatus	246
Checking the OpenFlow Rule Installation and Operational Verification	250
SafeMR: Privacy-aware Visual Information Protection for Mobile Mixed Reality	254
On the Activity Privacy of Blockchain for IoT	258
An SDN-based Approach to Protect Communication Between Virtual Machines	262
On the Use of Wide Channels in WiFi Networks	266
End-to-End Adversarial Learning for Intrusion Detection in Computer Networks	270
4A: Security and Privacy II	
Geolocation Tracking and Cloaking of Malicious Web Sites	274
Security and Fault Detection in In-node Components of HoT Constrained Devices	282
A Neural Attention Model for Real-Time Network Intrusion Detection	291

4B: Congestion Control and Network Management

An Odd Couple: Loss-Based Congestion Control and Minimum RTT Scheduling in MPTCP	300
Network Web Traffic Generator for Cyber Range Exercises	308
A Framework for Multiaccess Support for Unreliable Internet Traffic Using Multipath DCCP	316
5A: Network Management and Applications	
On Sampling and Recovery of Topology of Directed Social Networks - A Low-Rank Matrix Completion Based Approach	324
Bifröst: a Modular Blockchain Interoperability API	332
RL-Sketch: Scaling Reinforcement Learning for Adaptive and Automate Anomaly Detection in Network Data Streams	340
Machine Tools Fingerprinting for Distributed Numerical Control Systems	348
5B: Opportunistic Networks	
Performance Modelling of V2V Based Collective Perceptions in Connected and Autonomous Vehicles	356
Optimizing Inter-Cluster Flights of Post-Disaster Communication Support UAVs	364
Efficient Multi-Satellite Downlinks for Earth Observation Data Based on Distributed Arithmetic Coding	372
OPPLOAD: Offloading Computational Workflows in Opportunistic Networks	381
6A: Performance Evaluation	
The King is Dead Long Live the King! Towards Systematic Performance Evaluation of Heterogeneous Bluetooth Mesh Networks in Real World Environments	389
Association and Reliability in 802.11ad Networks: An Experimental Study	398
Exploring the Usefulness of Machine Learning in the Context of WebRTC Performance Estimation	406

Author Index	455
Packet-Preserving Network Coding Schemes for Padding Overhead Reduction	447
A Lesson in Scaling 6LoWPAN - Minimal Fragment Forwarding in Lossy Networks	438
rmin-Routing - Discovery and Operation of Routes in Wireless Ad-hoc Networks with Specified Statistical Minimum Reliabilities	430
Failure Resilient Traffic Engineering Using Segment Routing	422
6B: Routing and Resource Allocation	
IoTLogBlock: Recording Off-line Transactions of Low-Power IoT Devices Using a Blockchain	414