

# **2020 3rd International Conference on Hot Information-Centric Networking (HotICN 2020)**

**Hefei, China**  
**12 – 14 December 2020**



IEEE Catalog Number: CFP20O97-POD  
ISBN: 978-1-7281-9217-8

**Copyright © 2020 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:	CFP20O97-POD
ISBN (Print-On-Demand):	978-1-7281-9217-8
ISBN (Online):	978-1-7281-9216-1

**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](mailto:curran@proceedings.com)  
Web: [www.proceedings.com](http://www.proceedings.com)

# **2020 3rd International Conference on Hot Information-Centric Networking (HotICN 2020)**

## **Table of Contents**

<b>Preface .....</b>	vi
<b>Conference Committee .....</b>	vii

---

### **Blockchain**

Data Right Confirmation Mechanism Based on Blockchain and Locality Sensitive Hashing.....	1
<i>Zhenzheng Gao, Lifeng Cao, Xuehui Du</i>	
Continuous Distributed Key Generation on Blockchain Based on BFT Consensus .....	8
<i>Lei Lei, Ping Ma, Chunjia Lan, Le Lin</i>	
Blockchain-Enabled Identity Verification for Safe Ridesharing Leveraging Zero-Knowledge Proof .....	18
<i>Wanxin Li, Collin Meese, Hao Guo, Mark Nejad</i>	
Chained Tendermint: A Parallel BFT Consensus Mechanism .....	25
<i>Lei Lei, Chunjia Lan, Le Lin</i>	
Blockchain-Based Secure Collaboration Platform for Sharing and Accessing Scientific Research Data .....	34
<i>Afnan M. Alniamy, Hang Liu</i>	
Energy-Saving Resource Allocation with Lightweight Blockchain in Maritime Wireless Communication Networks .....	41
<i>Tingting Yang, Zhengqi Cui, Ruijin Sun, Hailong Feng, Dandan Liang, Nan Cheng</i>	

### **Information Centric Networking (ICN)**

Intelligent Eco Networking (IEN) III: A Shared In-network Computing Infrastructure towards Future Internet.....	47
<i>Shuokang Huang, Ruibiao Chen, Yu Li, Meimei Zhang, Kai Lei, Ting Xu, Xiquan Yu</i>	
A Pre-caching Mechanism of Video Stream Based on Hidden Markov Model in Vehicular Content Centric Network .....	53
<i>Lin Yao, Zhaoyang Li, Wenyu Peng, Bin Wu, Weifeng Sun</i>	
Research on Content Priority-Based Caching Strategy in NDMANET .....	59
<i>Quan Zheng, Yulin Bao, Zixuan Gao, Liu Yuan, Jian Yang, Xiaobin Tan</i>	
Defense Mechanism of Interest Flooding Attack Based on Deep Reinforcement Learning .....	65
<i>Jie Zhou, Jiangtao Luo, Lianglang Deng, Junxia Wang</i>	
An Efficient Name Look-up Architecture Based on Binary Search in NDN Networking .....	71
<i>Deng Jing, Zhu Liyue, Xia Zhengyu</i>	

An ICN Cache Pricing Mechanism Based on Non-cooperative Game Model of Users and Advertisers .....	77
<i>Quan Zheng, Jiawei Zhang, Rong Wu, Huasen He, Xiaobin Tan, Liu Yuan</i>	
A Barter and Combinatorial Auction Based Hierarchical Resource Trade Mechanism for Cybertwin Network .....	84
<i>Hui Liang, Wei Zhang</i>	
Asymmetric Framework Evolution of Named Data Networking and Use Cases in VANET .....	90
<i>Jiangtao Luo, Lianglang Deng, Junxia Wang, Yongyi Ran</i>	
Cooperative Caching in a Content-Centric Network for High-Definition Map Delivery .....	96
<i>Jiaxi Liu, Chi Zhang, Yuanyuan Wang, Lingbo Wei, Jianqing Liu</i>	
A Lightweight Verification Mechanism for MPEG-DASH in Named Data Networking.....	102
<i>Yujia Fan, Yu Tao, Yi Zhu</i>	
The Impact of Chunk Size on Named Data Networking Performance .....	108
<i>Christos Natsis, Christos-Alexandros Sarros, Vassilis Tsaoussidis</i>	
Triangle Area Based Multivariate Correlation Analysis for Detecting and Mitigating Cache Pollution Attacks in Named Data Networking.....	114
<i>Muhammad Sohail, Quan Zheng, Zeinab Rezaiefar, Muhammad Alamgeer Khan, Rizwan Ullah, Xiaobin Tan, Jian Yang, Liu Yuan</i>	
Edge Cache Replacement Strategy for SVC-Encoding Tile-Based 360-degree Panoramic Streaming.....	122
<i>Ju Zhang, Qian Gao, Guoqiang Zhang</i>	
High Definition Map Distribution in Named Data Networking Based VANETs .....	129
<i>Jialun Lu, Wang Yang, Fan Wu</i>	
Reactivity Enhancement of Cooperative Congestion Control for Satellite Networks .....	135
<i>Adrien Thibaud, Julien Fasson, Fabrice Arnal, Renaud Sallantin, Emmanuel Dubois, Emmanuel Chaput</i>	
SGX-ICN: A Secure and Privacy-Preserving Information-Centric Networking with SGX Enclaves .....	142
<i>Zhe Yang, Xudong Li, Lingbo Wei, Chi Zhang, Chengjie Gu</i>	
Hierarchical Identity-Based Security Mechanism Using Blockchain in Named Data Networking .....	148
<i>Bing Li, Maode Ma, Rong Xia</i>	
EFM: An Edge-Computing-Oriented Forwarding Mechanism for Information-Centric Networks .....	154
<i>Shanshan Shi, Jun Li, Haibo Wu, Yongmao Ren, Jiang Zhi</i>	

## **Network Intelligence and Testbed for ICN**

BFSN: A Novel Method of Encrypted Traffic Classification Based on Bidirectional Flow Sequence Network ....	160
<i>Xinxin Tong, Xiaobin Tan, Lingan Chen, Jian Yang, Quan Zheng</i>	
An Efficient Model for Smartphone Forensics Using SMS Spam Filtering.....	166
<i>Liwen Peng, Xiaolin Zhu, Peng Zhang</i>	
Design and Implementation of MobilityFirst Future Internet Testbed .....	170
<i>Amin Ullah, Xiang Chen, Jian Yang</i>	
Objective-Oriented Resource Pooling in MPTCP: A Deep Reinforcement Learning Approach .....	175
<i>Chengyuan Huang, Jiao Zhang, Tao Huang</i>	

Finite-Time Synchronization and Identification of Markovian Switching Delayed Networks with Multiple Weights .....	182
<i>Qian Xie, Duo Guo, Tong Wang, Xiaoping Yang, Xinghua Liu</i>	
Programmable Switch Aided Content Popularity Prediction and Caching Strategy.....	188
<i>Wenji He, Haipeng Yao, Tianle Mai, Mohsen Guizani</i>	
Large-Scale Small Satellite Network Simulator: Design and Evaluation.....	194
<i>Mengjie Liu, Yongqiang Gui, Jian Li, Hancheng Lu</i>	
Analysis on Requirements of Software-Defined Satellite Networking with Flow-Wise Real-Time Control .....	200
<i>Ran Zhang, Jia Shao, Jiang Liu, Man Ouyang, Tao Huang, Hua Lu</i>	

**Author Index**