

# **2022 IEEE International Conference on Decentralized Applications and Infrastructures (DAPPS 2022)**

**San Francisco Bay, California, USA  
15-18 August 2022**



**IEEE Catalog Number: CFP22S63-POD  
ISBN: 978-1-6654-9173-0**

**Copyright © 2022 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:	CFP22S63-POD
ISBN (Print-On-Demand):	978-1-6654-9173-0
ISBN (Online):	978-1-6654-9172-3

**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)

CURRAN ASSOCIATES INC.  
**proceedings**  
.com

# 2022 4th IEEE International Conference on Decentralized Applications and Infrastructures (DAPPS) **DAPPS 2022**

## Table of Contents

Message from the IEEE DAPPS 2022 General Chairs .....	vii
Message from the DAPPS 2022 Technical Program Committee Chairs .....	viii
DAPPS 2022 Committees .....	ix
Keynote .....	xi

## 2022 4th IEEE International Conference on Decentralized Applications and Infrastructures (DAPPS)

Being Accountable Never Cheats: An Incentive Protocol for DeFi Oracles .....	1
<i>Bowen Liu (Singapore University of Technology and Design, Singapore), Jianying Zhou (Singapore University of Technology and Design, Singapore), and Yong Zhi Lim (Singapore University of Technology and Design, Singapore; TUV SUV Asia Pacific, Singapore)</i>	
Can We Effectively Use Smart Contracts to Stipulate Time Constraints? .....	11
<i>Tobias Eichinger (Service-centric Networking, Technische Universität Berlin, Germany) and Marcel Ebermann (Service-centric Networking, Technische Universität Berlin, Germany)</i>	
Blade: A Blockchain-supported Architecture for Decentralized Services .....	19
<i>Sebastian Göndör (Service-centric Networking, TU Berlin, Telekom Innovation Laboratories, Germany), Hakan Yildiz (Service-centric Networking, TU Berlin, Telekom Innovation Laboratories, Germany), Martin Westerkamp (Service-centric Networking, TU Berlin, Telekom Innovation Laboratories, Germany), and Axel Küpper (Service-centric Networking, TU Berlin, Telekom Innovation Laboratories, Germany)</i>	
Game-theoretic Designs for Blockchain-based IoT: Taxonomy and Research Directions .....	27
<i>Fatemeh Erfan (Polytechnique Montreal, Canada), Martine Bellaïche (Polytechnique Montreal, Canada), and Talal Halabi (Université Laval, Québec, Canada)</i>	

Modeling and Enforcing Access Control Policies for Smart Contracts .....	38
<i>Jan-Philipp Töberg (Karlsruhe Institute of Technology, Germany), Jonas Schiffel (Karlsruhe Institute of Technology, Germany), Frederik Reiche (Karlsruhe Institute of Technology, Germany), Bernhard Beckert (Karlsruhe Institute of Technology, Germany), Robert Heinrich (Karlsruhe Institute of Technology, Germany), and Ralf Reussner (Karlsruhe Institute of Technology, Germany)</i>	
Managing Collaborative Tasks within Heterogeneous Robotic Swarms using Swarm Contracts .....	48
<i>Sanjaya Mallikarachchi (College of Computing and Digital Media, DePaul University, USA), Can Dai (College of Computing and Digital Media, DePaul University, USA), Oshani Seneviratne (Rensselaer Polytechnic Institute, USA), and Isuru Godage (College of Computing and Digital Media, DePaul University, USA)</i>	
Gromit: Benchmarking the Performance and Scalability of Blockchain Systems .....	56
<i>Bulat Nasrulin (Delft University of Technology, the Netherlands), Martijn De Vos (Delft University of Technology, the Netherlands), Georgy Ishmaev (Delft University of Technology, the Netherlands), and Johan Pouwelse (Delft University of Technology, the Netherlands)</i>	
Performance Analysis of Hyperledger Besu in Private Blockchain .....	64
<i>Caixiang Fan (University of Alberta, Canada), Changyuan Lin (York University, Canada), Hamzeh Khazaei (York University, Canada), and Petr Musilek (University of Alberta, Canada)</i>	
The DecCert PKI: A Solution to Decentralized Identity Attestation and Zooko's Triangle .....	74
<i>Sam Markelon (University of Florida, USA) and John True (University of Florida, USA)</i>	
<b>Author Index .....</b>	<b>83</b>