

# Preface

This book contains the contributions selected for publication at the fifth edition of the Distributed Ledger Technology Workshop (DLT 2023), which was held in Bologna (Italy), on May 25 and 26, 2023. This event follows the previous editions of the workshop held in Perugia (2018), Pisa (2019), Ancona (2020), and Roma (2022), which represent one of the two annual meetings of the Italian DLT group.

The DLT workshops are meant as a forum for researchers, developers, and users to discuss issues related to Distributed Ledger Technology and its adoption in research and business scenarios. The primary goal is to foster discussion and cross-fertilisation of ideas among experts in different fields related to DLT, and thus advance the national and international state of the art. Research, applications, case studies, and experiences concerning DLT are all encouraged.

The DLT 2023 workshop solicited two kinds of contributions: research papers and oral communications, both entailing an oral presentation at the workshop. Research papers have been peer reviewed by at least three experts in the field, and 19 of them (out of 29 submissions) have been accepted for publication in this volume.

We would like to sincerely thank all the authors who submitted their papers to our workshop, and to the members of the Technical Program Committee and their subreviewers for their valuable work in evaluating the submitted papers.

July 31<sup>st</sup>, 2023

Paolo Mori  
Ivan Visconti  
Stefano Bistarelli

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# Program

## DAY 1: May 25th

9:00 - 9:10 **Opening session**

9:10 - 11:00 **Session 1**

**Exploiting Ethereum after "The Merge": The Interplay between PoS and MEV Strategies (oral communication)** - Davide Mancino, Alberto Leporati, Marco Viviani and Giovanni Denaro

**Towards a quantum-safe transaction signature in Ethereum (oral communication)** - Stefano Bistarelli, Marco Fiore, Ivan Mercanti and Marina Mongiello

**Analysis of the Confirmation Time in Proof-of-Work Blockchains (oral communication)** - Ivan Malakhov, Andrea Marin, Daria Smuseva and Sabina Rossi

**Certified Byzantine Consensus with Confidential Quorum for a Bitcoin-derived Permissioned DLT** - Marco Benedetti, Francesco De Sclavis, Marco Favorito, Giuseppe Galano, Sara Giammusso, Antonio Muci and Matteo Nardelli

**Smart contracts in a bare-bone UTXO model (oral communication)** - Massimo Bartoletti, Riccardo Marchesin and Roberto Zunino

**Studying the Compounding Effect: The Role of Proof-of-Stake Parameters on Wealth Distribution** - Alberto Leporati

**A theoretical basis for Blockchain Extractable Value (oral communication)** - Massimo Bartoletti and Roberto Zunino.

11:20-13:10 **Session 2**

**A dataset trading system based on DLT and IPFS (oral communication)** - Marco Di Francesco, Lodovica Marchesi, Michele Marchesi and Raffaele Porcu

**Not Enough IoT After All: Visiting Transactional Characteristics of IoT Blockchains** - Abhimanyu Rawat, Vanesa Daza and Matteo Signorini

**On the Synchronization Power of Token Smart Contracts (oral communication)** - Giorgia Azzurra Marson

**Orchestration of Blockchain-based Digital Twins** - Marco Benedetti, Marco Favorito and Matteo Nardelli

**PUF-Based Identification Tags and Blockchain for Supply Chain Management (oral communication)** - Carmelo Felicetti, Antonella Guzzo, Antonino Rullo, Domenico Saccà and Francesco Pasqua

**A Decentralized Data Sharing Framework based on a Key-Redistribution method** - Fadi Barbara, Mirko Zichichi, Stefano Ferretti and Claudio Schifanella

**From Bitcoin to Stablecoin. The monetary development of crypto assets (oral communication)** - Emilia Richiello

14:30-16:20 **Session 3**

**Equilibria in DeFi from State Context Inspection (oral communication)** - James Hsin-Yu Chiang, Conor McMenamin and Margherita Renieri

**Incentivizing Customer Reviews in the Grocery Industry: The Re-Taled Project's Approach** - Tania Bruno, Ettore

Etenzi, Luca Gualandi, Eraldo Katra, Rosario Pugliese, Alessio Taranto and Francesco Tiezzi

**Scalability in E-voting Systems using the Solana Blockchain (oral communication)** - Mohammad Hajian Berenjestanaki, Hamid Reza Barzegar, Nabil El Ioini and Claus Pahl

**Enforcing Confidentiality in Tornado Cash-based E-voting Systems** - Stefano Bistarelli, Ivan Mercanti and Francesco Santini

**Blockchain in Public Governance: New Possibilities and Challenges for Public Data Management and e-Voting (oral communication)** - Ali Mert Gürkan

**The Referendum Problem in Anonymous Voting for Decentralized Autonomous Organizations** - Vincenzo Iovino, Artem Grigor and Giuseppe Visconti

**A Traffic-Analysis Proof Solution to Allow K-Anonymous Payments in Pseudonymous Blockchains (oral communication)** - Francesco Buccafurri, Vincenzo De Angelis and Sara Lazzaro

16:40-18:20

#### **Session 4**

**Clearing Fuzzy Signatures: a Proof of Work Blockchain Protocol for Biometric Identification (oral communication)** - Paolo Santini, Giulia Rafaiani, Massimo Battaglioni, Marco Baldi and Franco Chiaraluce

**An AMM minimizing user-level extractable value and loss-versus-rebalancing** - Conor McMenamin and Vanesa Daza

**From Paper to Blockchain: A Proof of Concept for Storing Aviation Maintenance Documents (oral communication)** - Nader Mohamed and Francesco Bruschi

**Modeling Carne PRI supply chain with the \*-Chain Platform** - Stefano Bistarelli, Francesco Faloci, Paolo Mori, Carlo Taticchi and Marino Miculan

**Sharpening Ponzi Schemes Detection on Ethereum with Machine Learning (oral communication)** - Letterio Galletta and Fabio Pinelli

**ChorSSI: A Model-Driven Framework for Self-Sovereign Identity on Blockchain (oral communication)** - Tommaso Cipitelli, Alessandro Marcelletti and Andrea Morichetta

**Towards a Privacy-Preserving Dispute Resolution Protocol on Ethereum (oral communication)** - Andrea Gangemi

18:30-19:30 **DLT group meeting**

## **DAY 2: May 26th**

9:00-11:00 **Session 5**

**Oral communication: Towards mutable NFTs: Non-Fungible Mutable Tokens (oral communication)** - Andrea Lisi, Damiano Di Francesco Maesa, Paolo Mori, Laura Ricci and Simone Schiavone

**Blockchain-based Information Ecosystems** - Francesco Salzano, Remo Pareschi, Lodovica Marchesi and Roberto Tonelli

**An investigation tool for BESU permissioned blockchain performance. (oral communication).** - Leonardo Mostarda, Andrea Pinna, Davide Sestili and Roberto Tonelli

**A brief analysis regarding NFTs and digital artworks** - Thayssa Bohadana Martins

**Participatory design of token economies for local communities (oral communication)** - Sowelu Avanzo, Guido Boella, Claudio Schifanella and Cristina Viano

**Protecting digital identity in the Metaverse: the case of access to a cinema in Decentraland** - Mirko Zichichi, Chantal Bompreszi, Giovanni Sorrentino and Monica Palmirani

**Using blockchain for certification of media creations: the case of "TRUTHSTER" (oral communication)** - Federico Costantini, Francesco Crisci, Silvia Venier, Stefano Bistarelli and Ivan Mercanti

**A Platform for Analyzing Payment Channel Networks in Supporting Real-world Payment Patterns (oral communication)** - Marco Benedetti, Giuseppe Galano, Sara Giammusso and Matteo Nardelli

11:20-13:00

**Session 6**

**A Decentralized Biometric Authentication Protocol based on Blockchain (oral communication)** - Nibras Abo Alzahab, Giulia Rafaiani, Marco Baldi, Massimo Battaglioni and Franco Chiaraluce

**A Tale on Decentralizing an App: the Case of Copyright Management** - Andrea Vitaletti and Marco Zecchini

**Scryfall: an online tool to validate Bitcoin script (oral communication)** - Stefano Bistarelli, Andrea Bracciali and Ivan Mercanti

**Toward Scalable Docker-Based Emulations of Blockchain Networks** - Diego Pennino and Maurizio Pizzonia

**Account Abstraction: Improving User Experience in Blockchain Systems (oral communication)** - Luca Ambrosini, Giuliano Gremlich, Tommaso Agnola, Lorenzo Ronzani, Roberto Guidi and Tiziano Leidi

**Optimistic and Validity Rollups: Analysis and Comparison between Optimism and StarkNet** - Luca Donno

**A Word on Policy-based Credential Disclosure in SSI (oral communication)** - Stefano Bistarelli, Chiara Luchini and Francesco Santini

14:30-16:25

**Session 7**

**Analysis of the Impact of European Policy on Distributed Ledger Technologies and Crypto-assets** - Hasret Ozan Sevim

**Introduction to Consensus in Weakly Byzantine Asynchronous Environments** - Aleksander Kampa

**Impact of post-quantum signatures on blockchain and DLT systems** - Stephen Holmes

**A blockchain-based framework for GDPR-compliant personal data processing (oral communication)** - Chiara Braghin, Stelvio Cimato and Marco De Simone

**Ensuring Correctness of Smart Contracts with Constrained Horn Clauses (oral communication)** - Fabio Fioravanti and Giulia Matricardi

**Towards the Automated Verification of Smart Contracts (oral communication)** - Chiara Braghin, Elvinia Riccobene and Simone Valentini

**Security Verification of Ethereum Smart Contracts with ML Taking a Free Ride from Static Analysis (oral communication)** - Dalila Ressi, Lorenzo Benetollo, Carla Piazza, Michele Bugliesi, Silvia Crafa and Sabina Rossi

**Blockchain for Data Marketplace: Enhancing Security, Privacy and Trust (oral communication)** - Silvio Meneguzzo, Alfredo Favenza, Valentina Gatteschi and Claudio Schifanella