4th International Symposium on Foundations and Applications of Blockchain 2021

FAB 2021, May 7, 2021, University of California, Davis, California, USA (Virtual Conference)

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Preface

The goal of 4th International Symposium on Foundations and Applications of Blockchain 2021 (FAB'21) is to bring researchers and practitioners of blockchain – the technology behind Bitcoin – together to share and exchange results. The program of FAB'21 features two keynote speakers and seven presentations of scientific papers, followed by a student session. The program committee selected five papers for publication in the proceedings out of twelve submissions. Prof. Rachid Guerraoui's keynote's speech is about the road to a universal internet machine; Prof. Elaine Shi's keynote talk is about game-theoretically secure protocols inspired by blockchains.

The scientific papers published in these proceedings cover topics ranging from new distributed problem formalizations to solutions to decentralized finance problems. Aștefănoaei et al. formalize the notion of Dynamic Repeated Consensus for blockchain applications by offering Tenderbake that improves over the one-shot consensus protocol Tendermint. Cholvi et al. combine recent results on the cryptocurrency object and conflict-free replicated data structures to introduce the Distributed-Grow-only Set object that supports an atomic append operation. They propose an eventually consistent and Byzantine fault tolerant implementation of it that does not need consensus. Bhat et al. propose the DAISIM open-source simulator for the DAI stable coin offered by the MakerDAO project. They model investors with a portfolio of four assets to investigate when investors choose to mint or burn DAI, and determine the DAI price. Krishnamachari et al. propose a new approach to construct the Automated Market Makers that maintain a liquidity pool of assets related mathematically; this approach eliminates arbitrage opportunities. Mitra et al. introduce a consistent time metric for blockchain distributed systems by generating blocks regularly and inserting timestamps in each block. They illustrate their approach with an implementation in Hyperledger Fabric.

The program also features two additional presentations about blockchain applications. Sguerra et al. present a short paper on the performance of auctions running on Ethereum and Tezos whereas Kahya and Krishnamachari present EcoTrojan to incentivize environment-friendly on-campus behaviors.

To promote and support undergraduate research, we have introduced a unique student session in collaboration with Blockchain Acceleration Foundation (FAB), a nonprofit student-run organization that fosters blockchain research and education tailored to undergraduates. The session covers exciting and promising projects such as (1) BAF Wallet supported by NEAR Foundation, (2) Alchedemia for Next Generation Digital Learning Environment (NGDLE) supported by the Algorand Foundation, (3) Ethereum Teacher Training Program supported by the Ethereum Foundation, (4) Token Delegation and DeFi Governance supported by Blockchain Clubs at UCLA, (5) Solace DeFi supported by Blockchain at UCSB, and (6) ZUZ Exchangeable Credit by Blockchain at CMU.

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