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Proof-of-Work (PoW) is one of the fundamental and widely-used consensus algorithms in blockchains. In PoW, nodes compete to receive the mining reward by trying to be the first to solve a puzzle. Despite its fairness and wide availability, traditional PoW incurs extreme computational and energy waste over the blockchain. This waste is considered to be one of the biggest problems in PoW-based blockchains and cryptocurrencies. In this work, we propose a new useful PoW that mitigates the energy waste by incorporating pre-computed (disclosable) randomness into the PoW. The key idea is to inject special randomness into puzzles via (one-way) algebraic commitments that can be stored and later publicly disclosed. Unlike the traditional PoW which is wasteful, our approach enables pre-computed commitments to be utilized by a vast array of public-key cryptography methods that require offline-online processing (e.g., digital signature, key exchange, zero-knowledge protocol). Moreover, our PoW preserves the desirable properties of the traditional PoW and therefore does not require a substantial alteration in the underlying protocol. We formally proved the security of our PoW, and then fully implemen (tion)3.3 J.4 (l)3.3 (m)3.4 7.3 (o)-3.3 (v)3.3 (e)3.3 (d) capabilities. We will also talk about our performance analysis of the Trace protocol which leverages accumulator schemes used in Blockchain settings.

Friday, November 20, 2020

4:00pm

Online, Microsoft Teams

Please email efe3@usf.edu for more information

THE PUBLIC IS INVITED

Examining Committee

Attila A. Yavuz, Ph.D., Major Professor

Nasir Ghani, Ph.D.

Mehran Mozaffari Kerman, Ph.D.

Jay Ligatti, Ph.D.

Kaiqi Xiong, Ph.D.

Computer Science and Engineering
College of Engineering

Sudeep Sarkar, Ph.D.
Department Chair
Computer Science and Engineering
College of Engineering

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If you require a reasonable accommodation to participate, please contact the Office of Diversity & Equal Opportunity at 974-2373 at least five (5) working days prior to the event