Blockchains + Network Privacy = A Nightmare

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ABSTRACT

The hope that cryptography and decentralization together might ensure robust user privacy was among the strongest drivers of the early success of blockchains like Bitcoin. A desire for privacy still permeates the growing blockchain user base today. Nevertheless, due to the inherently public nature of most blockchain ledgers, users' privacy is severely restricted, and deanonymization attacks are prevalent. Several privacy solutions have been proposed to solve these issues, and a few have been implemented. Nevertheless, some key challenges remain unresolved and a few among those seem to be unsolvable in the information-theoretic and cryptographic sense. In this talk, we discuss privacy challenges, promising solutions, and unresolved privacy issues with blockchains. In particular, we study prominent privacy attacks, analyze the existing privacy solutions, and finally describe interesting unresolved challenges towards publishing and retrieving transactions privately.

Author Keywords

Blockchain; Cryptocurrencies; Privacy; Anonymity; Payment Channel Networks; Interoperability

BIOGRAPHY

Prof. Aniket Kate is an Associate Professor in the computer science department at Purdue university. He is an applied cryptographer and a privacy researcher. His research builds on and expands applied cryptography, distributed computing, and data-driven analysis to solve security/privacy problems in decentralized environments. His current projects focus on

communication freedom and distributed ledgers (or blockchains). He is a recipient of the NSF CAREER Award for 2019.

Before joining Purdue in 2015, he was a junior faculty member at Saarland University, Germany. He completed his postdoctoral fellowship at Max Planck Institute for Software Systems (MPI-SWS), Germany. He has received his PhD from the University of Waterloo, Canada, and his masters from IIT-Bombay, India.

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