

The Visualized Analysis of Bitcoin Change Wallets in the Coin Flow Network

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Abstract—In recent years, crimes using bitcoin as a tool have brought severe impacts to the social order. Bitcoin has the characteristics of high anonymity, decentralization, peer-to-peer, and the use of asymmetric encryption. These high tech features make bitcoin a new criminal tool which often used by organized criminal groups. Therefore, analyzing bitcoin flow has become critical for law enforcement to conduct a criminal investigation. However, due to its UTXO (Unspent Transaction Output) transaction pattern, many change wallets are generated in analyzing bitcoin flow, which affects the judgment of actual money flow analysis. In this research, we implement input-output differential and temporary rules to detect change wallets by analyzing bitcoin transaction pattern characteristics. Furthermore, we design web crawlers as a tool to collect and parse transactions of highly suspected criminal bitcoin wallets. Micro and macro perspectives of network analysis are provided by social network analysis (SNA) and visualization technology. The experimental results indicate that the proposed rules can detect both clustered and marginal change wallets. By eliminating the noise information caused by change wallets can provide coherent financial flows of interpretation for criminal investigation.

Keyword—Bitcoin Flow Analysis, Social Network Analysis, Visual Analysis



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