

VISUAL ANALYSIS OF THE BITCOIN TRANSACTION NETWORK

ADVISORS

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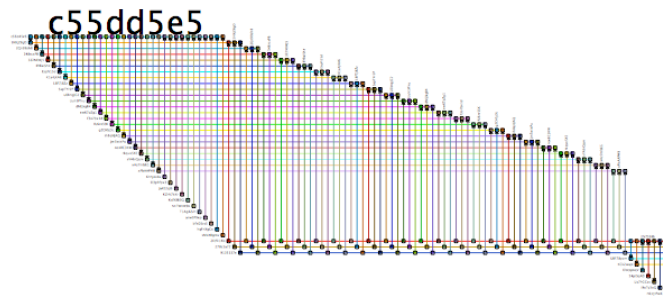
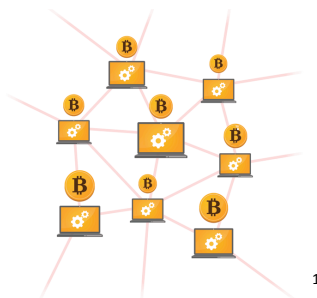
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GENERAL TOPIC

Bitcoin, the most successful digital cryptocurrency, is growing at an astonishing pace and is challenging several notions of traditional government-regulated currencies. As such, researchers, analysts, and policy makers require appropriate models on which to base decisions and recommendations regarding this phenomenon. Visual analytics tools can help to shed light on how and why Bitcoin works. The objective of the research project “Visual Analysis of the Bitcoin network” is to develop methods and tools to analyze the network of transactions, i.e., the transfers of Bitcoins between pseudonymous addresses.



INTERNSHIP TOPICS

Depending on the student’s expertise and interest we can offer two main topics for an internship:

1) *Design and implementation of a web-based network visualization tool*

In the project, we develop web-based visual tools using technologies such as D3.js and other Javascript libraries, WebGL and WebSockets for high-performance visualization of the network. The student will take part in the tool development process and be able to contribute own ideas for the design as well as coding skills. Beside design and coding, (automated) testing and performance checks will be of importance during the development.

2) *Evaluation of address clustering algorithms*

Actors in the Bitcoin network change their addresses in the network frequently to obfuscate their identity. A variety of so-called “address clustering” algorithms exist that reverse this process, i.e., they aggregate addresses that are likely to belong to the same “entity” (owner), which is a valuable information for the analysis of transactions. The student will identify different algorithms from the literature, implement them and conduct systematic comparisons of characteristics and results using visual tools.

REQUIREMENTS AND EXPECTATIONS

Interested students should have ideally followed a visual analytics or similar course in the past (but this is no requirement). Depending on the focus within the project they should be experienced in implementing web-based prototypes in Javascript (topic 1), or conducting literature research and implementing algorithms in Python (topic 2).

¹ <http://coinbet.com/news/anonymity-and-the-future-of-bitcoin-70>