

Master2 Internship (stage),

Title: Machine Learning on graphs to understand who's doing what on Bitcoin.

Location: Lyon 1 University, LIRIS lab

Keywords: Machine Learning, Network Science, Bitcoin, Graph Neural Networks

Supervision: [Rémy Cazabet](#)

Duration: 5 or 6 months.

What's the stage about?

The stage is part of the BITUNAM research project. BITUNAM stands for Bitcoin User Network Analysis and Mining.

The goal of this research project is to analyze the transactions occurring in Bitcoin and other major cryptocurrencies in order to characterize them. Because Cryptocurrencies use distributed, open ledgers stored in a blockchain, the history of all transactions between (anonymous) addresses can be harvested.

Our objective is to use techniques from Machine Learning, Data Mining and Network Analysis to discover meaningful information about those originally anonymous transactions. Our main objective is to estimate types of usages of a particular currency, and the evolution of these usages.

The type of questions we aim to answer are, for instance:

- What is the fraction of transactions made between individuals?
- What is the fraction of transactions whose goal is to buy a product?
- What is the fraction of transactions managed by exchanges platform (virtual wallet) versus wallet managed by individual users?
- How is the network of transaction organised, is it a single global village or is it structured in communities, for instance by countries or user's reference currency (Euros, Dollars, etc.)?
- What happens to money acquired through illegal or suspicious activities?
- Etc.

What the student will do more precisely

The topic is quite open. Depending on the interest and knowledge of the student, the contribution might go from a purely theoretical contribution (e.g., A new algorithm for community detection in very large evolving networks), to a domain specific analysis (e.g., Detailed analysis of activity of addresses involved in scams/illegal activities)

Stage Allowance: The student will receive the legal internship allowance in France, approximately 500€/months

Some References

-Meiklejohn, Sarah, et al. "A fistful of bitcoins: characterizing payments among men with no names." Proceedings of the 2013 conference on Internet measurement conference. ACM, 2013.

-Remy, Cazabet, Baccour Rym, and Latapy Matthieu. "Tracking bitcoin users activity using community detection on a network of weak signals." International conference on complex networks and their applications. Springer, Cham, 2017.

More references: <https://bitunam.blogspot.com/p/blog-page.html>