Cryptocurrency manipulation schemes could be found and foiled by new algorithm

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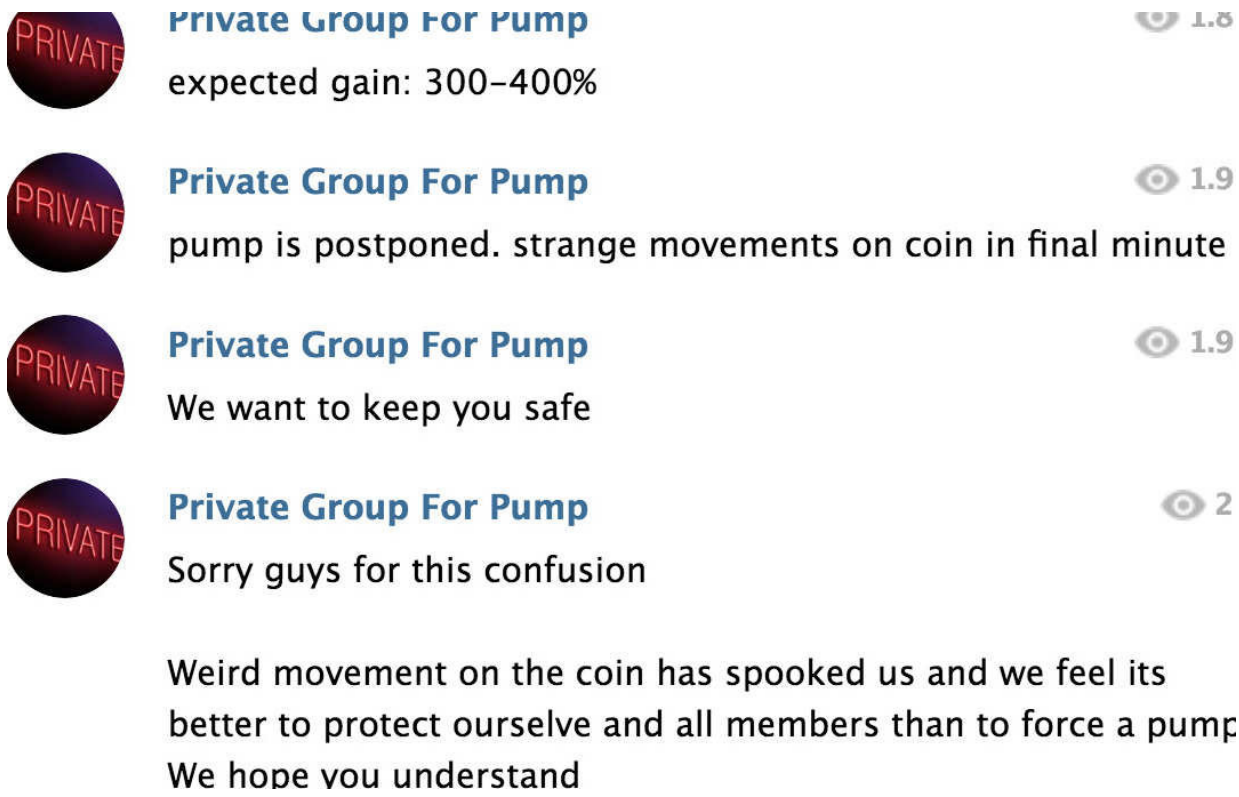

Credit: Jiahua Xu and Ben Livshits

Imperial scientists have created an algorithm to predict when specific cryptocoins are at risk of 'pump-and-dump' schemes.

The algorithm could help market regulators predict and prevent

cryptocurrency schemes that sees traders spend seven million US Dollars per month, only to find the price of their purchased currency falls as the scheme unfolds.

Pump-and-dump schemes are used to artificially inflate the price of a cryptocurrency – types of virtual currency—so that scheme organisers can sell the currency at a profit. However, the scheme works by rallying hundreds or thousands of investors together to boost, or 'pump' the price – some of whom don't act quickly enough when the price peaks, and will therefore lose money.

Long used by traditional financial markets, pump-and-dump schemes are now common in crypto financial markets too. Pump-and-dump scheme organisers often use their knowledge to gain from pump-and-dump events at the sacri?ce of fellow pumpers, and the practice costs the cryptocurrency market seven million USD per month. Deceived by the scheme, many investors rush into purchasing certain coins and lose money.

Now, for the first time, researchers at Imperial College London have studied pump-and-dump schemes as they happen and developed a machine learning algorithm that could help market regulators predict and prevent this type of market manipulation. An initial draft of the paper is published on arXiv.

Market manipulators

Organisers of pump-and-dump schemes promote a specific cryptocurrency, in crypto-exchanges like Binance or Yobit, to a group of people who then rally together to buy it simultaneously. The target cryptocurrency is often a relatively unknown token, like EZToken or Tajcoin.

The increase in demand causes the value of the currency to skyrocket quickly. Although markets fluctuate naturally, deliberately manipulating a currency to rise in value is known as 'pumping'.

When the currency has risen, the initial buyers quickly sell their coins and the value drops sharply, known as the 'dumping' stage. At this point, the currency's value has often dropped to well below what many users bought them for, meaning they lose money.

Lead author of the paper Dr. Jiahua Xu, from Imperial's Department of Computing, said: "Organisers of these schemes, who control the process and are ahead of the curve, can make large profits – while less experienced users often fall behind the curve and lose money."

Credit: Jiahua Xu and Ben Livshits

Dumping the pump

Pump organisers use anonymous messaging apps to organise pump-and-dump schemes. They also advertise in public forums like Reddit or Bitcointalk to attract partakers.

In their study, the researchers traced the message history of over 300 Telegram groups from July to November 2018, and identified 220 pump-and-dump events orchestrated through those groups.

The researchers found that around 100 Telegram pump-and-dump groups organise two pumps a day on average, ultimately encouraging investors to spend seven million USD per month.

They then looked for signs to identify which coin, if any, was about to be pumped by analysing coin features like ratings and market movements. Signs included coin market cap, and unusual fluctuations in price and volume, prior to the pump

Based on these signs, the researchers developed an algorithm that predicts with good accuracy how likely a specific coin is to be pumped before it happens.

The researchers say their algorithm and subsequent trading strategy suggestions could feasibly be used by regulators to curb pump-and-dump schemes.

They added that although these schemes may not technically be illegal, they are unethical and harmful to cryptocurrency users and markets in general. Co-author Dr. Ben Livshits, also from Imperial's Department of Computing, said: "At the moment, regulators like the Commodity

Futures Trading Commission can only warn users of the financial risk inherent in the schemes, and perhaps offer rewards to potential whistleblowers. Our algorithm might help them to proactively prevent pumping and dumping."

Dr. Xu said: "Like the buyers who fall victim to these schemes, market regulators often fall behind the curve of pumping-and-dumping. Our paper suggests a cheap and relatively easy way to tackle the issue.

Next, the researchers will consider measuring just how much money investors can lose in the schemes. Dr. Xu added: "In the current study, we only measured the total amount of money involved in trading. Our next task could be to measure financial losses to individual users."

More information: The Anatomy of a Cryptocurrency Pump-and-Dump Scheme, arXiv:1811.10109 [q-fin.TR] arxiv.org/abs/1811.10109

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