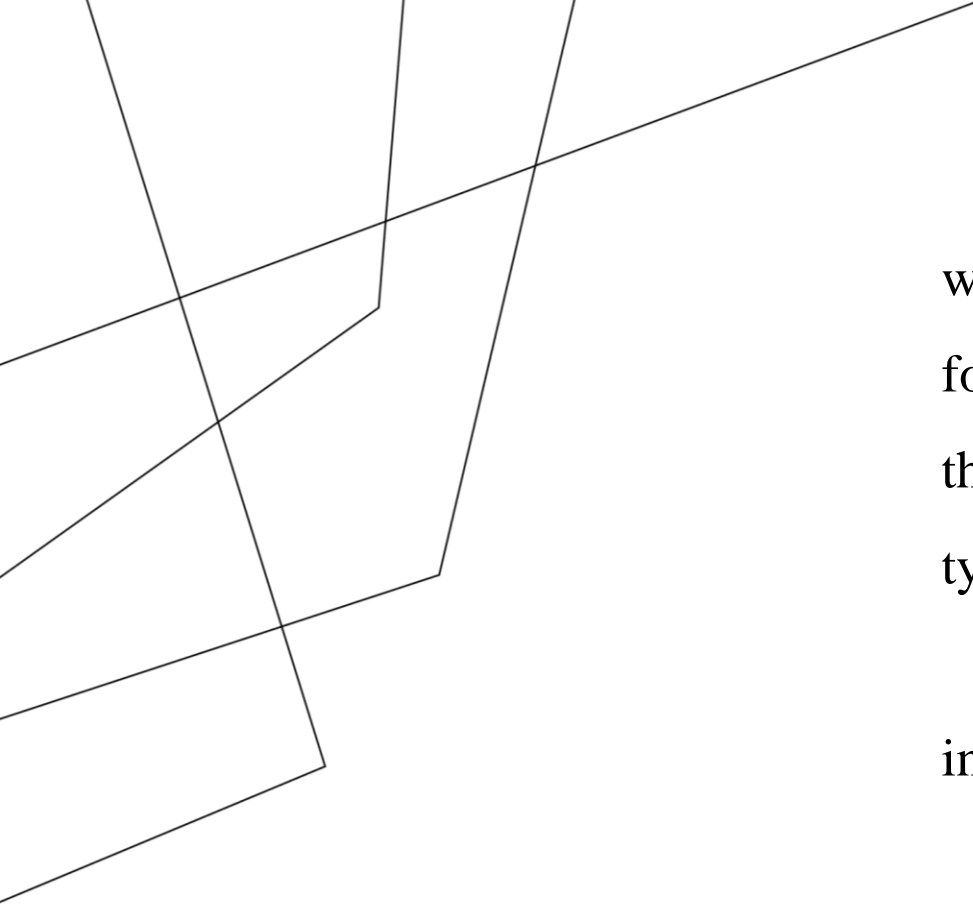# MONEY LAUNDERING DETECTION BASED ON NEO4J

Cheng Liang

ABSTRACT

Money laundering is a criminal activity, usually related to illegal and criminal activities such as drug trafficking, corruption, and bribery. Money launderers obtain a huge amount of illegal funds through criminal activities. This part of the illegal funds cannot be directly deposited in the bank. To avoid detection by relevant departments, money laundering the means of the people are endless. This work is to analyze common money laundering cases and make corresponding tests for different money laundering scenarios. The detection system is based on the "Docker" installation of the "Neo4j database".

Neo4j Database

Neo4J will be used as the database of this system.Neo4J is more suitable for this system than relational databases, because this system needs to find different account information with the same data in a large amount of data, so it needs faster query speed and deeper information association.

In December 2019, the police arrested a criminal who was engaged in money laundering activities and later found out that he had obtained 200,000 illegal cash through drug trafficking. His money laundering plan is typical, and this is how he works:
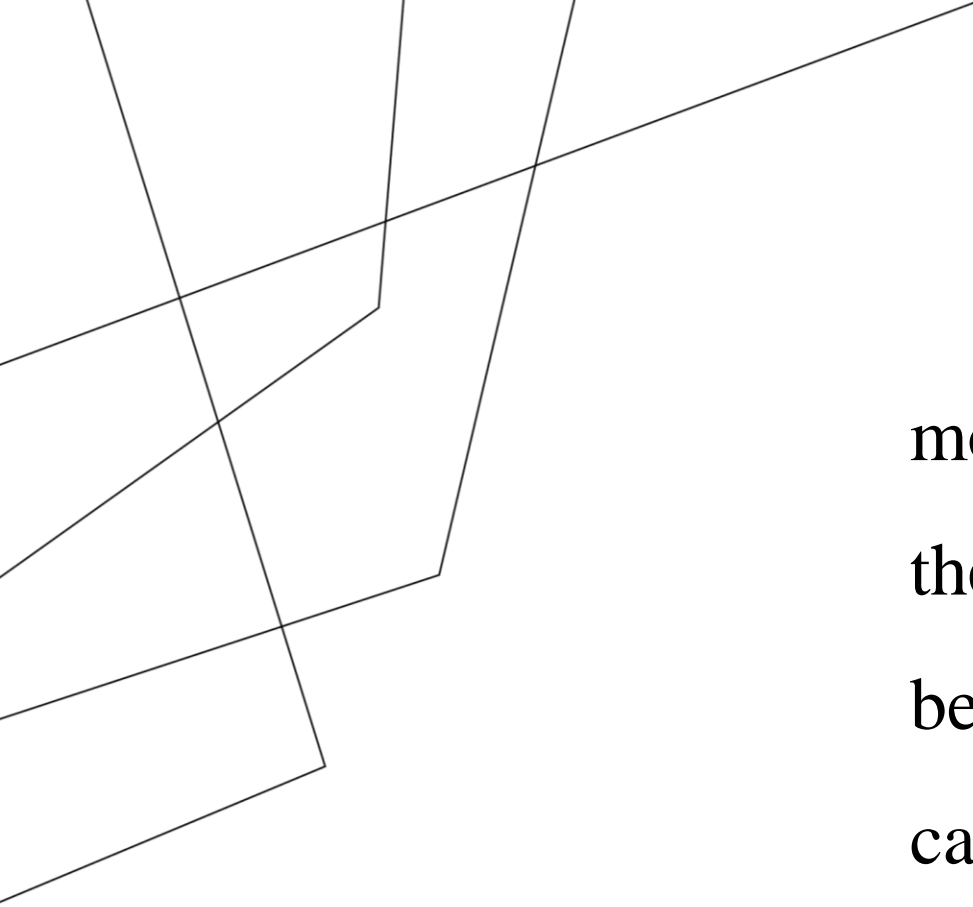
1. He illegally obtained 10 bank cards with no information connection through purchase, stealing, etc.

2. He divided 200,000 illegal cash into 10 shares of 200,00.

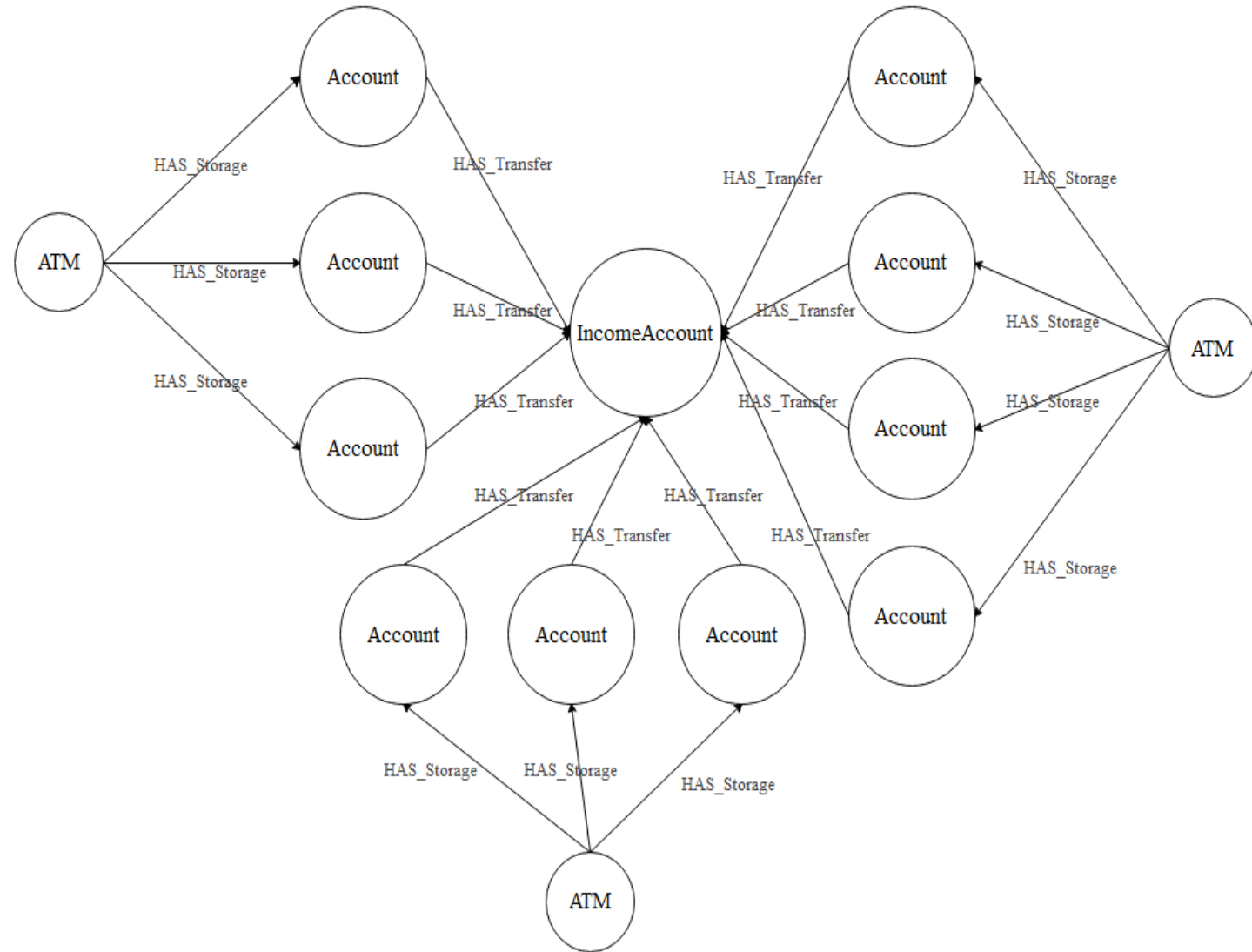3. He deposited the money on 10 bank cards on three different ATM machines.

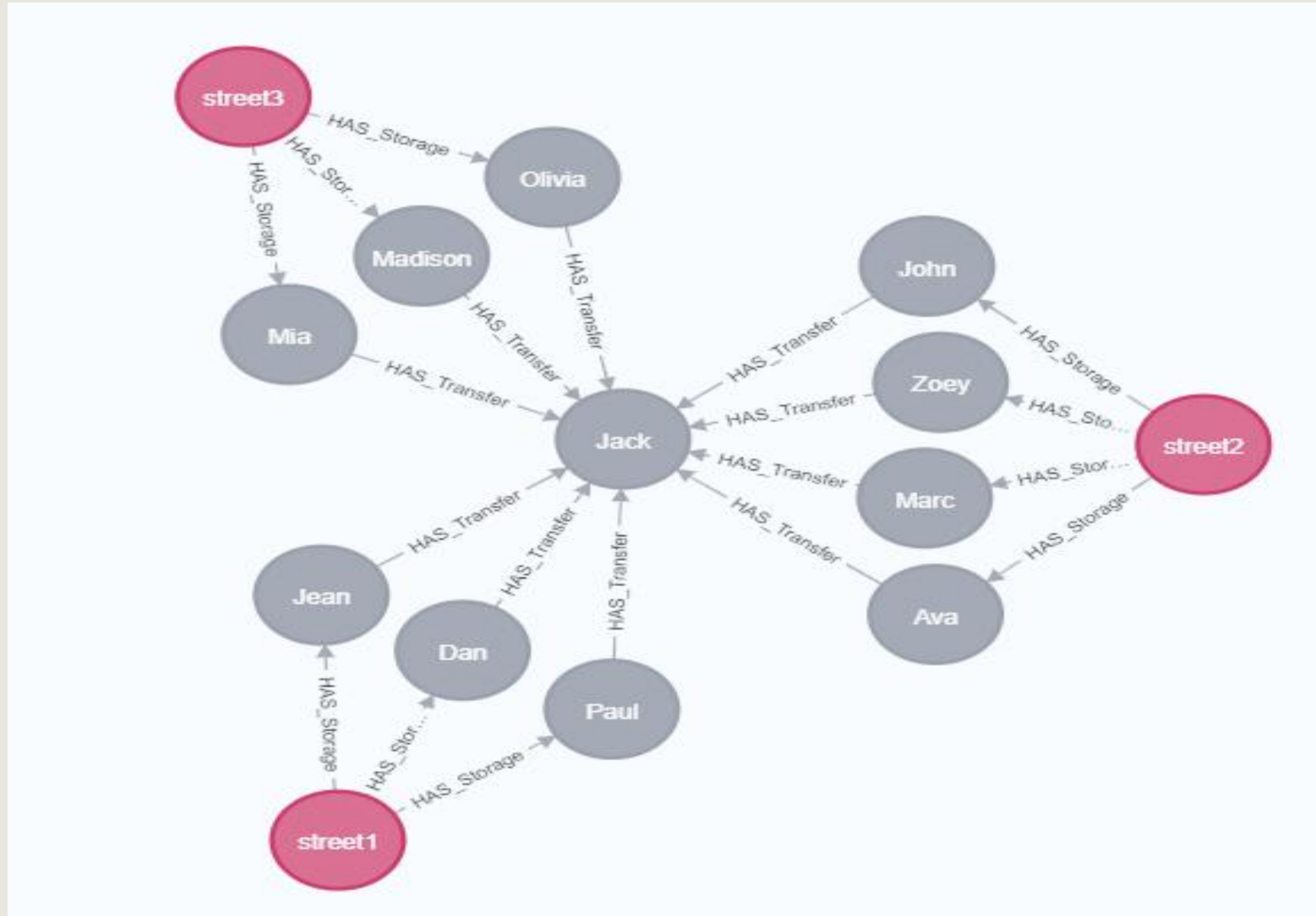4. Finally, he transfers all the money to a bank card.

TYPICAL SCENARIO

The graph database can help find money launderers faster. By representing the transaction as a graph, we can find the beneficiaries of money laundering in the case.

EXPLANATION OF SOLUTION

GRAPH DATA MODEL

SAMPLE DATA SET

QUERY STORAGE INFORMATION

MATCH (ATM)-[r:HAS_Storage]->(Accout)

RETURN ATM.address AS `ATM_Street`, Accout.name AS `Accout_ Name`, r.amount AS Amount

ORDER BY r.time

	ATM_Street	Accout_ Name	Amount
1	"street1"	"Dan"	"20000"
2	"street1"	"Jean"	"20000"
3	"street1"	"Paul"	"20000"
4	"street2"	"Zoey"	"20000"
5	"street2"	"John"	"20000"
6	"street2"	"Marc"	"20000"
7	"street2"	"Ava"	"20000"
8	"street3"	"Madison"	"20000"
9	"street3"	"Mia"	"20000"
10	"street3"	"Olivia"	"20000"

QUERY TRANSFER INFORMATION

MATCH (n:Account)-[r:HAS_Transfer]->(m:Account)

RETURN m.name AS `Suspects`, r.time AS `Transfer_Time`, r.amount AS Amount, n.name AS `Accout_ Name`

ORDER BY `Transfer_Time`

	Suspects	Transfer_Time	Amount	Accout_ Name
1	"Jack"	"12/20/2021"	"20000"	"Paul"
2	"Jack"	"12/20/2021"	"20000"	"Jean"
3	"Jack"	"12/20/2021"	"20000"	"Dan"
4	"Jack"	"12/20/2021"	"20000"	"Marc"
5	"Jack"	"12/20/2021"	"20000"	"John"
6	"Jack"	"12/20/2021"	"20000"	"Zoey"
7	"Jack"	"12/20/2021"	"20000"	"Ava"
8	"Jack"	"12/20/2021"	"20000"	"Olivia"
9	"Jack"	"12/20/2021"	"20000"	"Mia"
10	"Jack"	"12/20/2021"	"20000"	"Madison"

RESULT

Graph analysis helps to detect money laundering activities in the increasing number of cases. As criminals have become more sophisticated in money laundering, so have the tools that help counter them. When financial institutions are equipped with graphical analysis, there is no opportunity for money laundering activities.

FUTURE WORK

The cases analyzed in this article are universal, and there are many ways to launder money. Money laundering detection will reserve interface extension functions to provide corresponding solutions for different money laundering scenarios. For example, gang crimes, online gambling, and other cases. In the future, I will enrich the function and completeness of the system and add more case models.

THANKS !