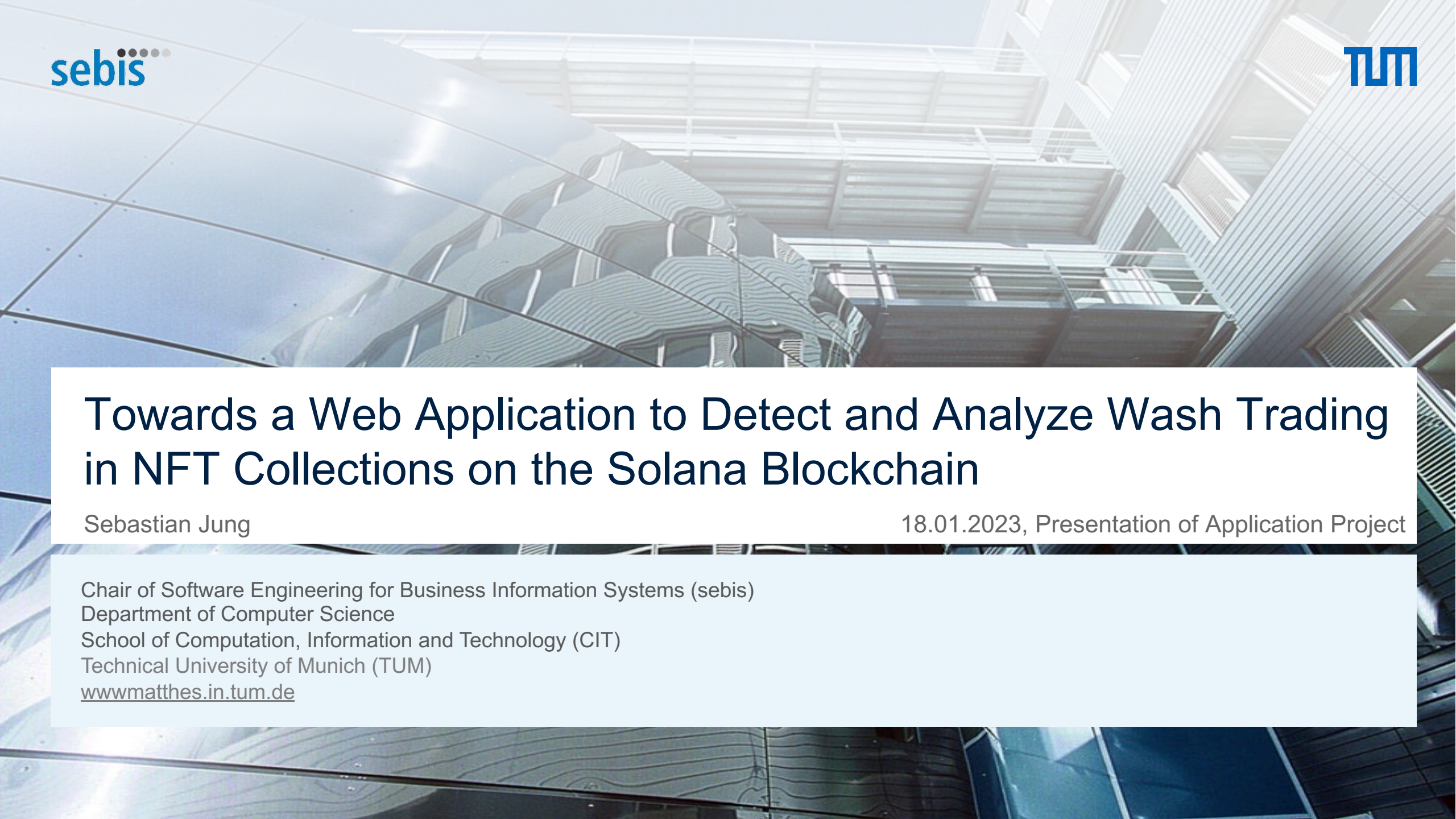


Towards a Web Application to Detect and Analyze Wash Trading in NFT Collections on the Solana Blockchain

Sebastian Jung

18.01.2023, Presentation of Application Project

Chair of Software Engineering for Business Information Systems (sebis)
Department of Computer Science
School of Computation, Information and Technology (CIT)
Technical University of Munich (TUM)
wwwmatthes.in.tum.de

Outline

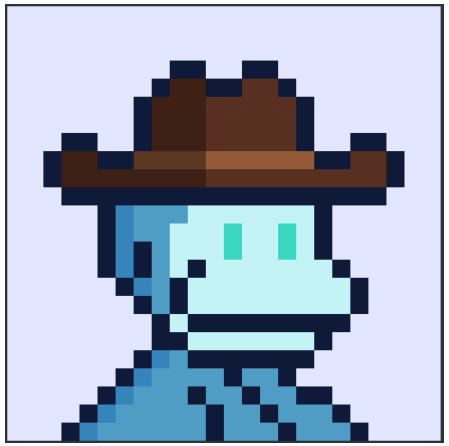
1. Introduction
2. Wash Trading Detection
3. Methodology
4. Results

Introduction

NFTs

- Huge hype in 2021
- Resulting Solana adopting the technology end of 2021
- Resulting in Volume of 20 Million SOL trading volume since then (10% of circulating supply)

=> Interesting to see WT situation on Solana as an Ethereum Competitor having such high volumes



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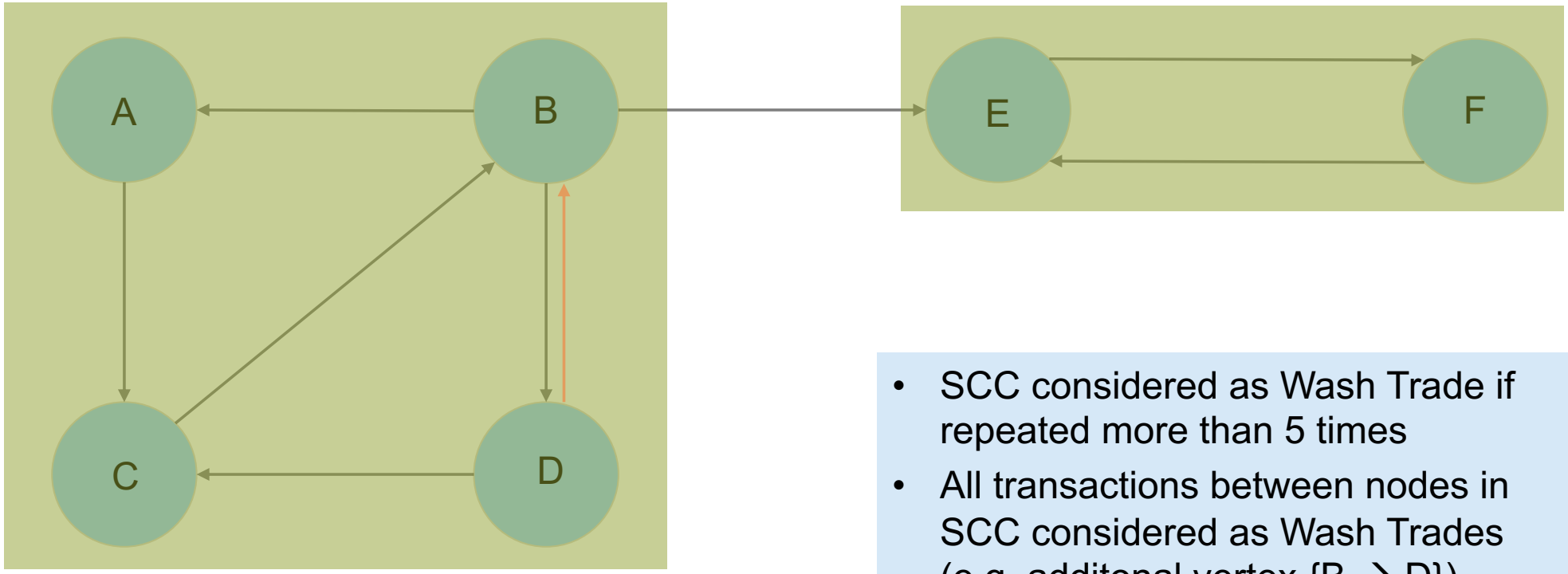
Wash Trading Detection



- SCC considered as Wash Trade if repeated more than 5 times
- All transactions between nodes in SCC considered as Wash Trades (e.g. additonal vertex {B → D})

Methodology – Wash Trade Detection

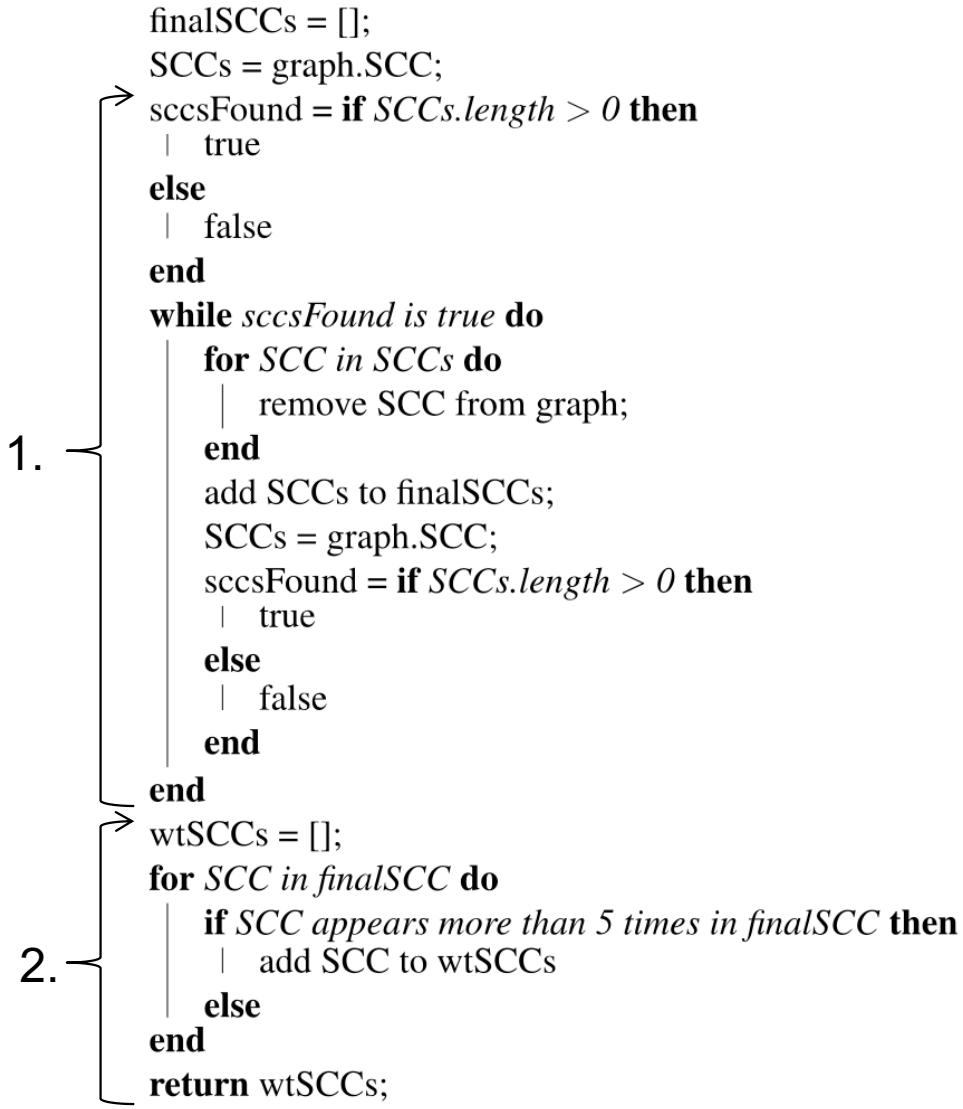
Algorithm explained:

1. Counting SCCs by running Tarjan's Algorithm multiple times until no more SCCs found
   - Each Iteration: Found SCCs removed from graph and added to separate List

2. SCCs repeated >= 5 times considered as wash trades

=> Returns 2D list of wash-trader-nodes seperated by SCC

Example: [[a, b, c], [d, e, f], [g, h, i]]



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Methodology – Tech Stack

NEXT.JS

- Modern fullstack react framework offering server side rendering

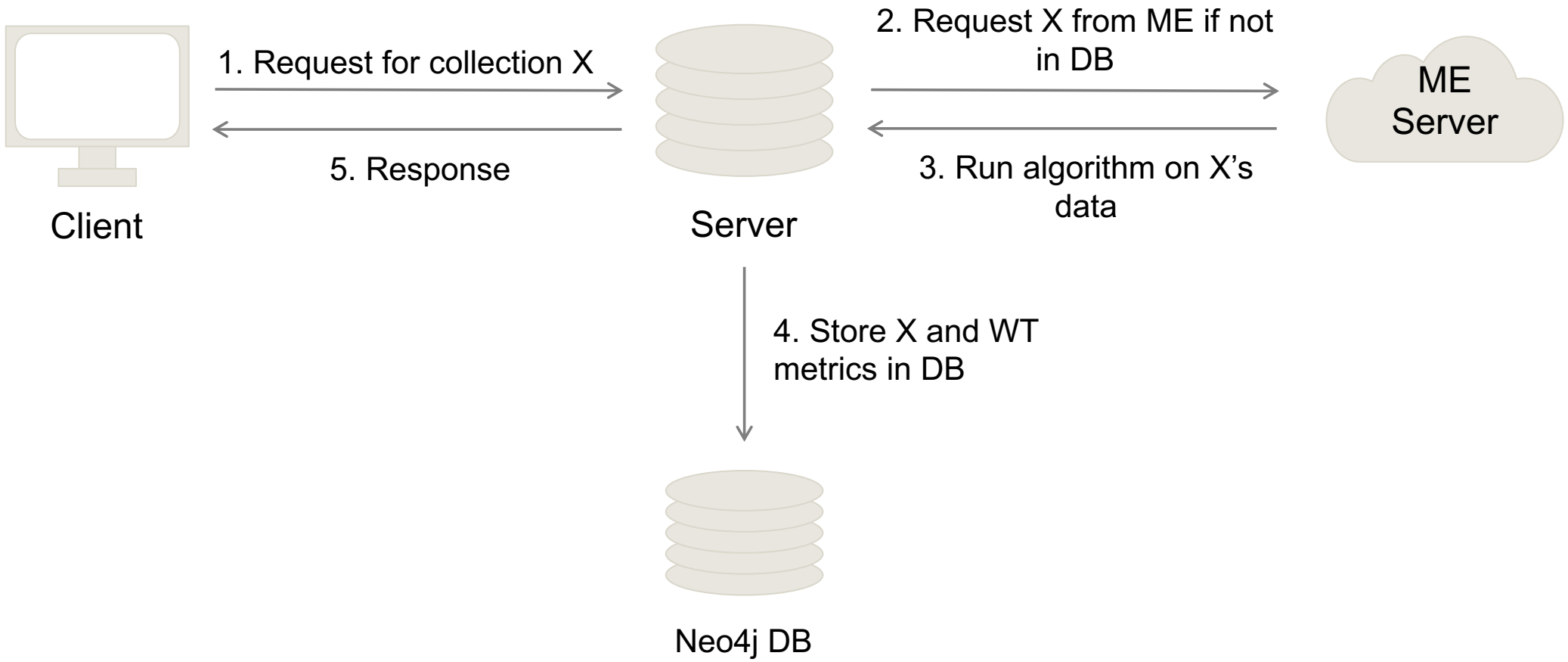
TypeScript

- Syntactical superset language of JavaScript
- Offers typesafety and other features missed in JS

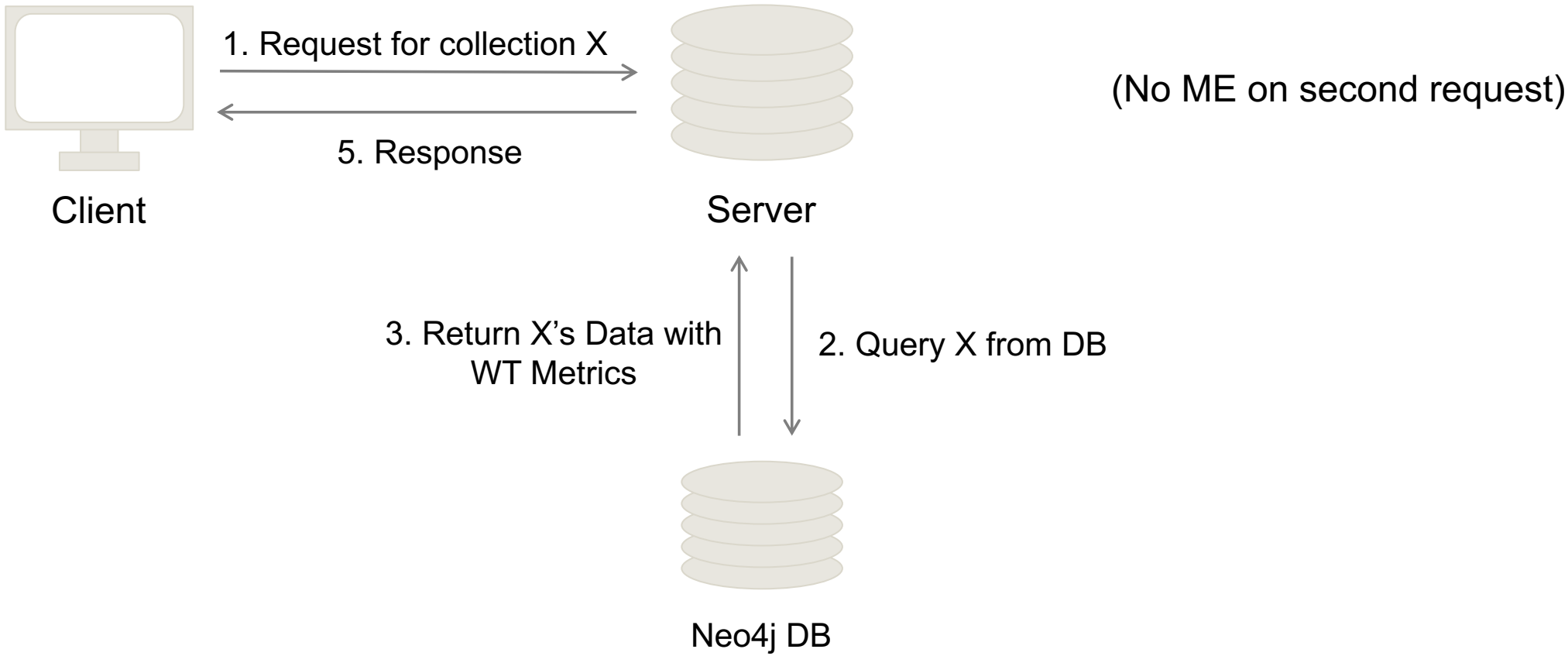
Neo4J

- Database providing native graph storage

Methodology – Web Application (First Search of Collection)



Methodology – Web Application (Collection already searched)



Methodology – Web Application

Single-Request-Calculation-Approach PROS & CONS

PROS

- Better User Experience due to shorter loading time, because no need to query ME API every search

CONS

- Outdated Data, because not updated anymore

Methodology – Web Application

Overall Limitations

- Still (!!!) Bug in ME API, that no more datasets than 15000 can be requested
  → not accurate data at large collections at the moment
- Long loading time (~15 mins) on requesting data from ME, because no native filtering at API possible
- Readability of Graph Library becomes worse the larger the dataset

Website Presentation

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Results – Benchmark of Algorithm

Benchmark results:

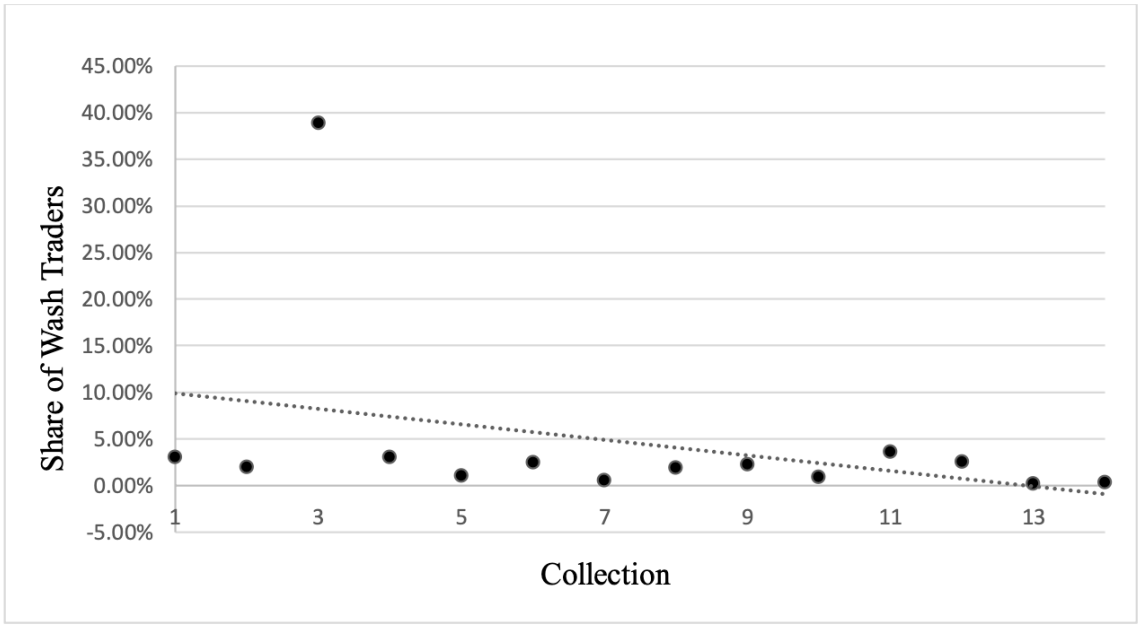
- 87% of collection having WTs according to the HM Index, deteced by our algorithm
- 100% of collection having no WTs according to the HM Index, deteced by our algorithm

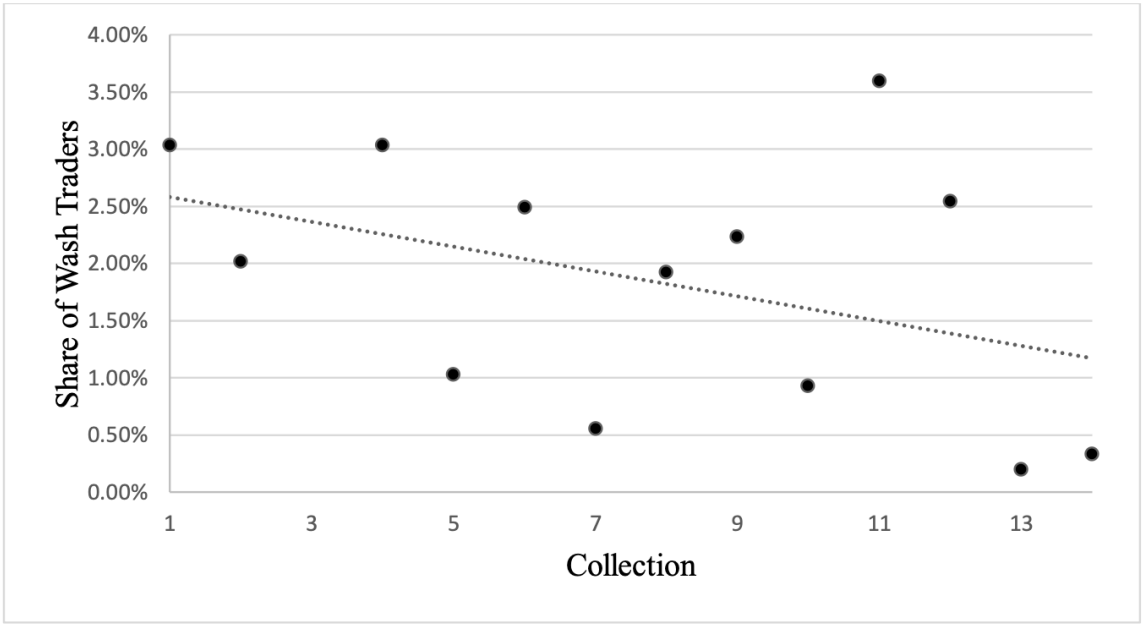
	NFT Collection	Wash Traded Share	HMWT Index
1	Anime Cute Girl	95.46%	100
2	Bear Cleo Club	95.12%	99
3	Alien Worlds	91.27%	95
4	Bulldog Mafia	88.58%	99
5	SolTV	85.51%	81
6	Samuway	84.38%	99
7	Last Retronauts	82.82%	99
8	Wack Wack	78.73%	99
9	Eco Eyes	73.59%	100
10	Gothic Demon	70.40%	95
11	Degen Reptilian	59.66%	99
12	ABC Pirates	12.22%	80
13	Trippin' Baby Ape Tribe	9.39%	51
14	BunnyToons	1.70%	35
15	Goblin Army	0.00%	72
16	Halo Gods	0.00%	0
17	Gyris: The Mara	0.00%	0
18	DooDoo	0.00%	3

Results

	NFT Collection	Total Volume	Wash Traded Share
1	Anime Cute Girl	1,539.10 SOL	95.46%
2	Bear Cleo Club	1,054.99 SOL	95.12%
3	Alien Worlds	249.77 SOL	91.27%
4	Bulldog Mafia	567.60 SOL	88.58%
5	SolTV	647.24 SOL	85.51%
6	Samuway	1,478.49 SOL	84.38%
7	Last Retronauts	1,450.45 SOL	82.82%
8	Wack Wack	2,572.26 SOL	78.73%
9	Eco Eyes	1,077.28 SOL	73.59%
10	Gothic Demon	499.77 SOL	70.40%
11	Degen Reptilian	312.62 SOL	59.66%
12	ABC Pirates	29.48 SOL	12.22 %
13	Trippin' Baby Ape Tribe	1,519.43 SOL	9.39%
14	BunnyToons	41.04 SOL	1.70%
15	Goblin Army	1,952.82 SOL	0.00%
16	Halo Gods	1,788.58 SOL	0.00%
17	Gyris: The Mara	426.21 SOL	0.00%
18	DooDoo	221.43 SOL	0.00%

Results


45.00%
40.00%
35.00%
30.00%
25.00%
20.00%
15.00%
10.00%
5.00%
0.00%
-5.00%
Share of Wash Traders
1
3
5
7
9
11
13
Collection


4.00%
3.50%
3.00%
2.50%
2.00%
1.50%
1.00%
0.50%
0.00%
Share of Wash Traders
1
3
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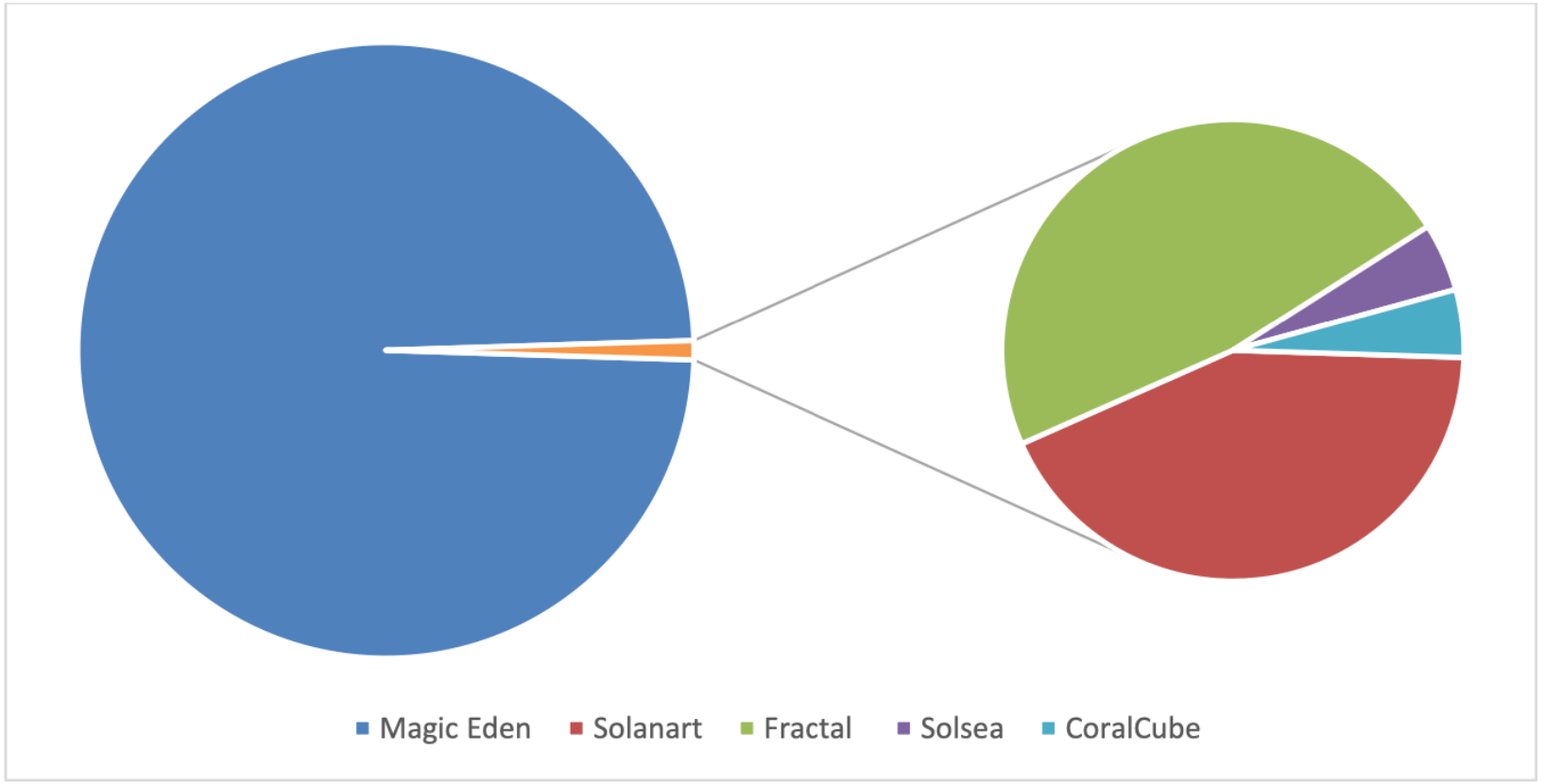
13
Collection

Results



Results

	NFT Collection	Wash Traded Share	Flagged by ME
1	Anime Cute Girl	95.46%	No
2	Bear Cleo Club	95,12%	Yes
3	Alien Worlds	91.27%	No
4	Bulldog Mafia	88.58%	No
5	SolTV	85.51%	No
6	Samuway	84.38%	Yes
7	Last Retronauts	82.82%	Yes
8	Wack Wack	78.73%	Yes
9	Eco Eyes	73.59%	No
10	Gothic Demon	70.40%	Yes
11	Degen Reptilian	59.66%	No
12	ABC Pirates	12.22%	No
13	Trippin' Baby Ape Tribe	9.39%	No
14	BunnyToons	1.70%	Yes

Prof. Dr.
Florian Matthes

Technical University of Munich (TUM)
TUM School of CIT
Department of Computer Science (CS)
Chair of Software Engineering for Business Information Systems (sebis)

Boltzmannstraße 3
85748 Garching bei München

+49.89.289.17132
matthes@in.tum.de
wwwmatthes.in.tum.de

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