



Measurements, Analyses, and Insights on the Entire Ethereum Blockchain Network

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Results and analyses are compiled into a full research paper & submitted to WebConf (WWW) 2020 conference.

Networks & Interaction Type

- ❖ TraceNet – Successful traces interactions
- ❖ ContractNet – Interactions between Smart Contracts
- ❖ TokenNet – Token related transactions
- ❖ TransactionNet – All transactions

	Vertices	MultiDiGraph		Simple Undirected Graph	
		Edges	Density	Edges	Density
TraceNet	75,807,179	768,813,599	1.34×10^{-7}	191,901,321	0.67×10^{-7}
ContractNet	11,332,750	317,967,546	24.8×10^{-7}	19,608,452	3.05×10^{-7}
TokenNet	30,429,099	173,421,940	1.87×10^{-7}	93,844,445	2.03×10^{-7}
TransactionNet	45,527,529	388,018,489	1.87×10^{-7}	128,368,878	1.24×10^{-7}

	Simple Directed Graph	Simple Undirected Graph	
	Reciprocity	Assortativity	# of Articulation Points
TraceNet	0.06	-0.13	1,214,137
ContractNet	0.21	-0.64	28,309
TokenNet	0.03	-0.13	7,55,513
TransactionNet	0.03	-0.12	1,337,527

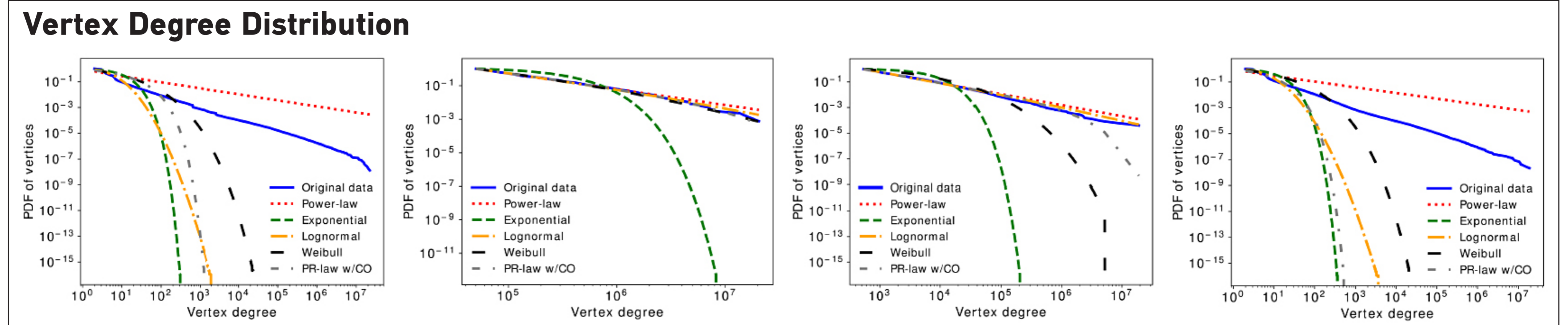
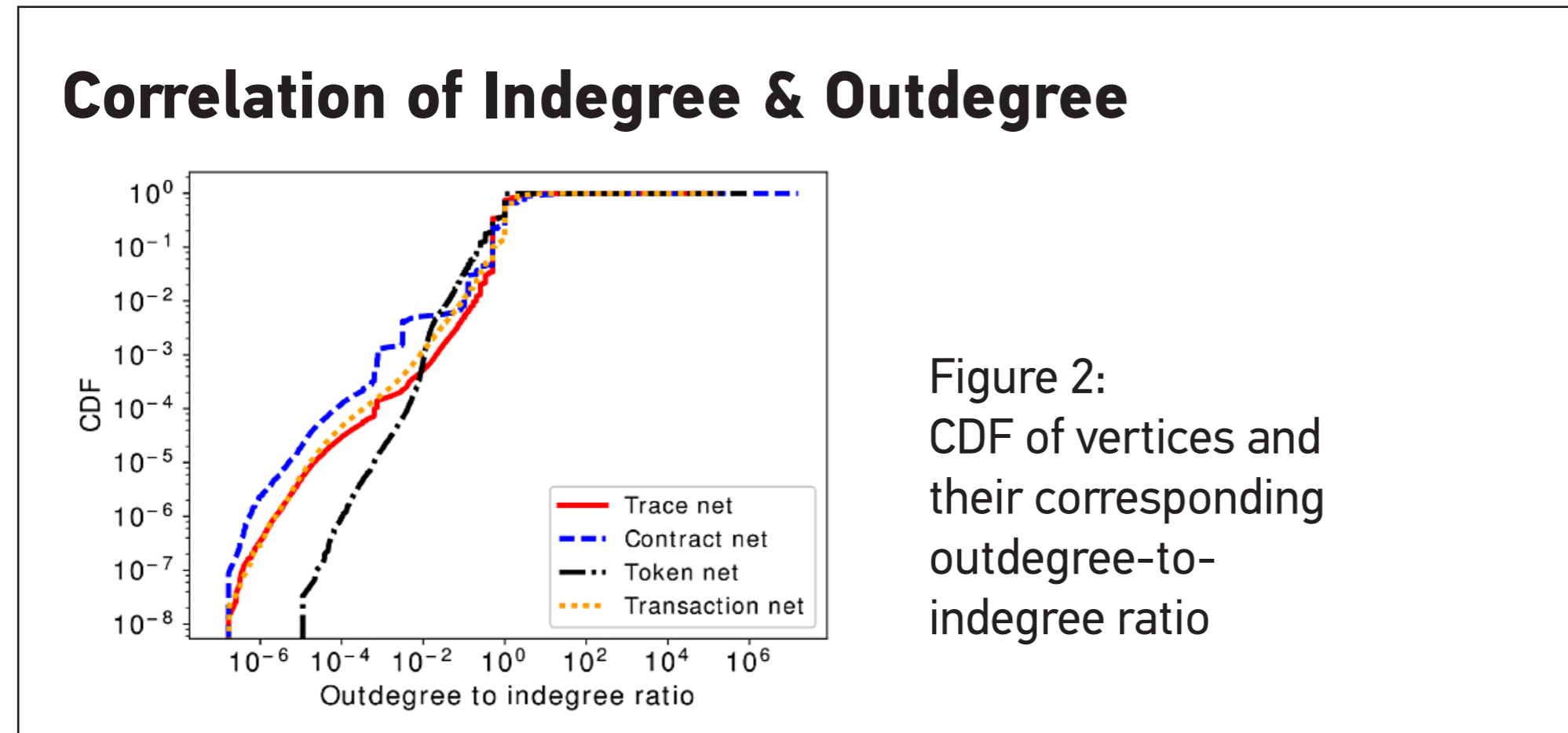


Figure 1: Degree distribution fit power-law, exponential, Log-normal, Weibull and power-law w/ cut-off distributions. Left to right – TraceNet, ContractNet, TokenNet and TransactionNet.

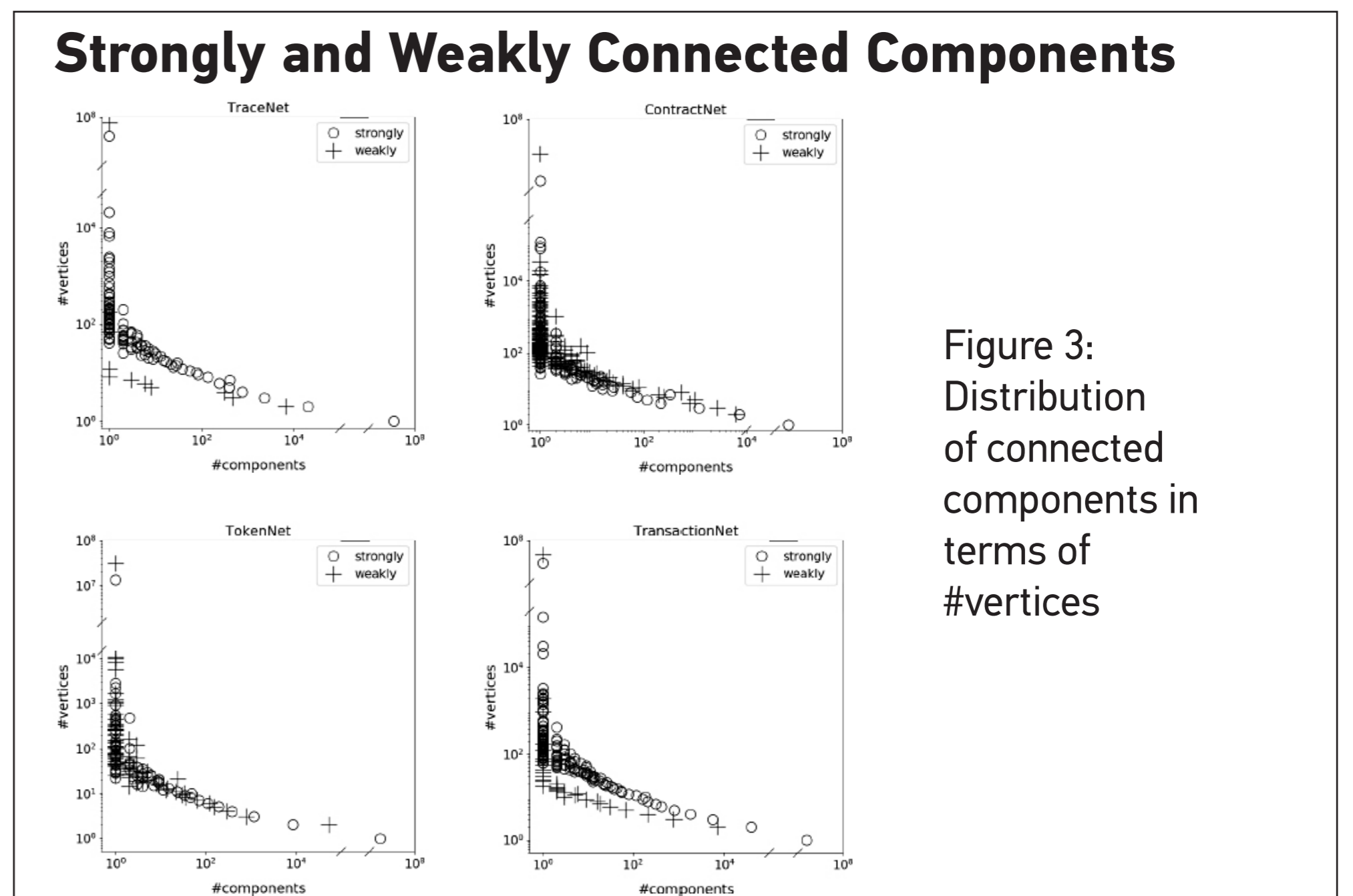


of Triangles & Global Clustering Coefficient

	Largest Strongly Connected Comp.		Largest Weakly Connected Comp.	
	# of Triangles	C_G	# of Triangles	C_G
TraceNet	4,008,794	0.099	5,813,165	0.077
ContractNet	405,265	0.212	871,359	0.078
TokenNet	2,803,894	0.209	5,296,640	0.175
TransactionNet	1,908,138	0.064	4,550,517	0.100

Core Decomposition

	Simple Undirected Graph					
	Largest Strongly Connected Components			Largest Weakly Connected Components		
	k_{max}	V	E	k_{max}	V	E
TraceNet	247	510	64,962	98	221	12,058
ContractNet	23	52	726	264	1071	143,352
TokenNet	154	2457	326,072	218	475	57,124
TransactionNet	74	352	19,146	105	682	55,926



The entire interaction network of Ethereum blockchain (block #0 to #7185508) is reconstructed to analyse the possible interaction types in the network: user-to-user, user-to-contract, contract-to-contract and contract-to-user.