Nitin Awathare

Mumbai

✉ nitina@cse.iitb.ac.in   📞 +91 9503884632   🪪 IIT Powai, Mumbai
in linkedin profile   ○ github profile

Education

Jul 2016 – Feb 2022	**IIT Bombay** *Ph.D. in the Department of Computer Science and Engineering*
Jul 2013 – May 2015	**IIT Kharagpur** *M.Tech in the Department of Computer Science and Engineering*
Jul 2008 – May 2012	**WCE Sangli** *B.Tech in the Department of Computer Science and Engineering*

Work Experience

Jun 2015 - Jul 2016	**Capillary Technologies, Bangalore, India** • Worked on ERP application using AX-Dynamics.
Jun 2012 - Jul 2013	**Persistent System Ltd., Pune, India** • Work on API development using Django-Python

Research Internship

Jun 2019 - Aug 2019	**IBM Research Lab, Bangalore, India** • Worked on empirical evaluation of different permissioneed blockchain protocols such as Quorum, Hyperledger Fabric, Corda.

Research Interest

My area of interest is majorly related to *Distributed Systems*. Specifically, During my Ph.D. I worked on performance improvement in the Blockchain in terms of the amount of allowable computation and throughput without compromising security and entitled my Ph.D. thesis as "**On the Scalability of Blockchains**". However, I am interested in exploring other areas in Distributed Systems, such as consensus algorithms. Furthermore, I will be interested in the intersection of ML and Blockchain, such as efficiently running an ML model on the Blockchain.

Publications

2021

2. **Awathare, N.**, Das, S., Ribeiro, V. J. & Bellur, U. RENOIR: Accelerating Blockchain Validation using State Caching. *International Conference on Performance Engineering (ICPE)* (2021).

3. **Awathare, N.**, Suraj, Akash, Ribeiro, V. & Bellur, U. REBAL : Channel Balancing for Payment Channel Networks. *IEEE International Symposium on Modeling, Analysis, and Simulation of Computer and Telecommunication Systems (MASCOTS)* (2021).

2022

1. Das, S., **Awathare, N.**, Ren, L., Ribeiro, V. J. & Bellur, U. Tuxedo: Maximizing Smart Contract computation in PoW Blockchains. *ACM SIGMETRICS / IFIP PERFORMANCE* (2022).

Patent Application

Ongoing Papers

- **Renoir-NG**: Aims to reduce both block validation time as well as block creation time by pre-execute the transactions on arrival as an individual.

- **Integration of Tuxedo explaination about Tuxedo to sharded blockchain**: Allow Computation Intensive Transaction (CIT) in the sharded blockchain without violating existing security constraints.

- **Lightning network with partial view of topology**: Route the transactions with having only neighboring node information by compromising the privacy a bit.

Reviewer

Transactions on Management Information Systems(TMIS): TMIS is a scholarly quarterly journal that encourages submissions related to algorithmic, analytical modeling, design science, and system-oriented research.

M.Tech Thesis

Measuring and improving the quality of barrier coverage in the wireless sensor network: Coverage is a problem area in Wireless Sensor Networks that determines how well an area is monitored by the sensor network. One variation of the coverage problem is Barrier Coverage. A target belt region provides *strong k-barrier coverage* if all crossing paths (a path crossing the width of the belt region, originating from one parallel boundary of the belt region and terminating at the other) intersect the sensing region of at least k distinct sensors. In this work, we propose a distributed approach to improve the quality of k-barrier coverage with the objective of minimizing the number of sensors required.

Term projects

- **Edge based attack on time varying network:** The edge-based attack is the more constrained case of the node-based attack where the attacker targets down the link between the nodes. I this work, we evaluate the severity of the attack in terms of closeness centrality, network connectivity, etc., for the different attacking behavior that prioritizes the edge to attack based on betweenness centrality, eigenvector centrality, degree centrality, etc. Furthermore, we compare this attack with the node-based attack.

- **Implementation of ECMP and Firewall in Mininet Network using OpenDaylight SDN Controller:** In this work, we explore the possibility of implementing the ECMP (Equal Cost Multiple Path) routing in a network of SDN switches using an SDN controller. Specifically, we model a 100 node network of switches using the mininet network virtualization tool, and use the OpenDaylight SDN controller to realize ECMP functionality in the network. Furthermore, we use the SDN controller to implement Firewall functionalities in the SDN switches to filter out packets as per specific network criteria.

Skills

- Languages: C/C++, Java, Python, Shell Script, Solidity, Golang.
- Technologies: Ethereum, Bitcoin, Quorum.
- Tools: Omnet++, LaTeX, gnuplot.