



Deposited via The University of York.

White Rose Research Online URL for this paper:

<https://eprints.whiterose.ac.uk/id/eprint/223724/>

Version: Published Version

---

**Conference or Workshop Item:**

Alhabib, Reem and Yadav, Poonam (2024) Poster: Data Sharing in Autonomous Vehicles: Hyperledger Fabric Platform. In: UNSPECIFIED.

---

**Reuse**

Items deposited in White Rose Research Online are protected by copyright, with all rights reserved unless indicated otherwise. They may be downloaded and/or printed for private study, or other acts as permitted by national copyright laws. The publisher or other rights holders may allow further reproduction and re-use of the full text version. This is indicated by the licence information on the White Rose Research Online record for the item.

**Takedown**

If you consider content in White Rose Research Online to be in breach of UK law, please notify us by emailing [eprints@whiterose.ac.uk](mailto:eprints@whiterose.ac.uk) including the URL of the record and the reason for the withdrawal request.

# Poster: Data Sharing in Autonomous Vehicles: Hyperledger Fabric Platform

Reem Alhabib  
University of York  
reem.alhabib@york.ac.uk

Poonam Yadav  
University of York  
poonam.yadav@york.ac.uk

**Abstract**—The study proposes a Hyperledger Fabric-based data-sharing application for Autonomous Vehicles (AVs), addressing the secure data-sharing gaps, and revealing the impact of virtual user count on system performance.

## I. RESEARCH PROBLEM

AV systems make driving decisions using data from sensors and cameras, essential for validation, improvement, training, and accident legal liability. Thus, this data is crucial for various stakeholders such as government, owners, and insurance providers [1]. Accordingly, in this work, a Hyperledger-based solution has been implemented enabling Attribute-Based Access Control (ABAC) for efficient data-sharing.

## II. THE PROPOSED SOLUTION

As illustrated in figure 1, the system is mainly divided into:

- 1) Decentralised Application (DApp): It provides a robust interface for users to communicate with the system.
- 2) The storage module: InterPlanetary File System (IPFS) is used for scalable data storage and secure data retrieval. For immutable records, the generated hash is stored on Hyperledge.
- 3) Network Module. Hyperledger Fabric is used for secure data storage and sharing, with access control policies.

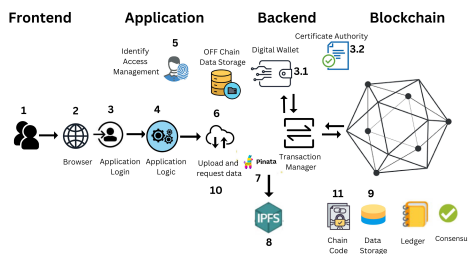


Fig. 1. The main components of the system and the entire life-cycle

## III. IMPLEMENTATION AND EVALUATION

The evaluation with the Caliper tool[2] for the system’s four chaincodes indicates that the system’s performance is impacted

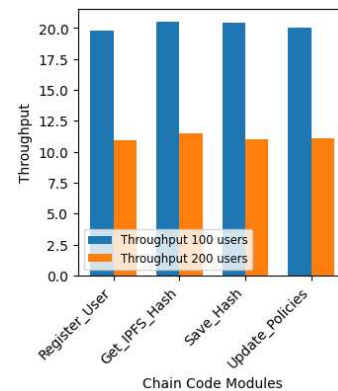


Fig. 2. The throughput within the operational scenarios of 100 and 200 users.

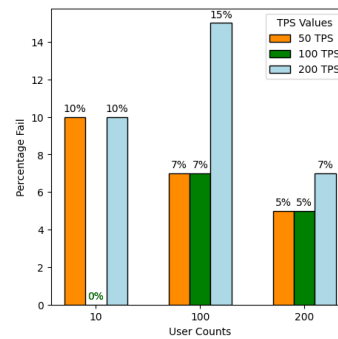


Fig. 3. The failure rate and the number of users under different Transactions Per Second (TPS) scenarios.

by the number of virtual users. For example, as in figure 2 a decrease in throughput observed with the increase in the number of users. In addition, the figure 3, illustrates the failure rate for the ”Update\_policies” chain code raises as the number of users increases. The next evaluation phase will focus on the system’s scalability in handling large volumes of AV data.

## REFERENCES

- [1] J. T. Correia, K. A. Iliadis, E. S. McCarron, M. A. Smolej, B. Hastings, and C. C. Engineers, ”Utilizing data from automotive event data recorders,” in *Proceedings of the Canadian Multidisciplinary Road Safety Conference XII, London Ontario, 2001*, p. 18.
- [2] ”Caliper: An open-source performance testing tool for evaluating system scalability,” 2023. [Online]. Available: <https://github.com/hyperledger/caliper/>