

## The Loop of the Rings: A Fully Decentralized Secure Cooperative System

آرش واعظی

پژوهشکده علوم کامپیوتر، پژوهشگاه دانش‌های بنیادی (IPM)

### Abstract

We introduce LoR, a secure, fully decentralized, and distributed cooperative system, where LoR stands for “the Loop of the Rings”.

Distinct from conventional transaction-oriented systems, LoR prioritizes *cooperation* using its ring-based structure, making it possible to be used both as a cooperative workspace as well as a versatile platform for service provisioning, accommodating various roles such as freelancers, IoT management systems, and even managing 5G-related services. Within this system, users have access to a secure and reliable environment, enabling them to offer a specific set of services to a potentially vast number of users. Our main contribution is to introduce the new structure along with its operating rules and principles, applying a combination of randomized procedures, in such a way that the whole system can be modeled fairly accurately in mathematically rigorous terms. This, in particular, is used to provide rigorous proof for the facts that LoR is both reliable and secure.

### Biography

Arash Vaezi obtained her Ph.D. in Computer Engineering from Sharif University of Technology in 2021. Since then, he worked as a Researcher Assistance in Sharif University of Technology under the supervision of Prof. Ghodsi, Dr. Abam, and Prof. Daneshgar. His research interests include designing distributed systems and computational geometry. Currently, he is seeking a postdoctoral research position within the Department of Computer Science at IPM.

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