

Project Summary

Overview Emerging decentralized applications (DApps) rely on independent oracle services to communicate with the real world and acquire operation-critical data. A host of challenges arises with the existing oracle services for DApps in the mobile and IoT scenarios: no effective mechanisms to ensure the trustworthiness of the procured data; not supporting diversified information sources to overcome potential bias and manipulation; inability to supply rich data types to fulfill a wide range of DApp-specific data requests. To address these challenges, we propose to develop the AROMA system—Addaptive Robust Oracle for Mobile Decentralized Applications in this project. The AROMA design is inspired by the recent advances in decentralized systems, consensus mechanisms, secure hardware, and privacy-preserving technology. This project will develop the AROMA system suite including the Middleware, Server, and public interfaces to accomplish the following objectives: 1) truthful data provision: a customer DApp can obtain trustworthy operation-critical data feeds from sources locally accessible to the distributed DApp participants; 2) adaptive oracle service optimization for elevated data accuracy, system performance, and user experience in a dynamic mobile environment; 3) resilient architectural design against adversarial influence; 4) participant privacy.

Intellectual Merit

(TBD)

Broader Impacts

(TBD)

Keywords: Decentralized Application; System; Truth Discovery; Learning-based Optimization; Trusted Computing; Privacy