BLOCKCHAIN & QUANTUM DEFENSE SIMULATOR

Overview

The University of Central Florida's Institute for Simulation and Training has been awarded by ARO (Army Research Office) a DURIP (Defense University Research Instrumentation Program) award to build a blockchain and quantum defense simulator. This unique program allows for state-of-the-art technology to be built not only to serve the U.S. Military government but also to provide for research and experimentation throughout academia, industry, non-profits, and other partnerships. As America's Partnership University™, UCF is committed to broad access critical infrastructure that will help define our future. With the age of quantum computing at our doorstep, the cryptographic methods used and the security of the entire process including the people, processes, and technology could be susceptible to bad actors.

Scope

The purpose of the blockchain and quantum defense simulator is not only to set up quantum gateways and a multi-testnet blockchain array but also to design scenarios that include human in the loop processes that can surface many potential risks and threats at the least of which is social engineering – the human hacking that is often the most effective attack vector. While we anticipate significant cyber defense projects and programs, our first project is responsive to the 2020 COVID pandemic. Dr. Dexter Hadley retooling his NIH Breast Cancer imaging predictive artificial intelligence (AI) platform to instead look at a large population of COVID lung imaging. The use of powerful AI combined with blockchain for validation and verification of medical records and privacy and security of the research protocol and records may show promise as a response to the current health crisis. Covidimaging.com provides additional details and current state of results in this novel program. In his recent book, *Blockchain for Medical Research*, Dr. Sean Manion cites the need for technology like the blockchain to improve research quality, verification, and repeatability using common data sets (Manion et al., 2020).

While the initial use case and operations for the blockchain and quantum defense simulator will only leverage the blockchain mining array of over 2 petahash of processing capability, future iterations, and other projects plan to leverage the quantum security features of this program and capability. Best of all, students stable access this capability through our affiliation with Blockchain Innovation Village for spinout region education of new technologies in emerging disciplines like blockchain and quantum and may also access the quantum learning lab with a series of quantum gateway computers for access to IBM's Q Network and other quantum simulators via classical computer simulation. Our team welcomes the opportunity to discuss the potential beyond cryptomining for a blockchain and quantum simulation to advance scientific discovery and help society with the most pressing issues.

As we continue our mission for education, we will continue to train the next generation of leaders and technologists in these emerging fields and provide broad and open access to people from many different backgrounds and levels of technical capability. Improving the understanding of our faculty and student population around complex but important principles may lead to exponential outcomes and rapid testing of new capabilities and discoveries. We're excited about what the future may hold and invite this community to continue the dialogue in these important areas.

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