

Affordable Learning Georgia Textbook Transformation Grants

Final Report for Mini-Grants

General Information

Date: 5/22/2020

Grant Round: 14

Grant Number: M81

Institution Name(s): Kennesaw State University

Team Members (Name, Title, Department, Institutions if different, and email address for each):
N/A

Project Lead: Dr. Reza Parizi

Course Name(s) and Course Numbers: Blockchain and Smart Contracts -SWE 4490 (special topic)

Final Semester of Project: Spring 2020

If applicable to your project:

Average Number of Students Per Course Section: 14

Number of Course Sections Affected by Implementation of Revised Resources: 1

Total Number of Students Affected by Implementation of Revised Resources: 14

1. Project Narrative

Describe the course of your revision or ancillary creation project, including

- *A summary of your project's purpose, plan, and timeline.*
- *The original works which were revised or added to, with links.*
 - *For example, if you revised an open textbook, give the title, author, and link.*
- *A narrative description of how the project's plan was carried out.*
- *Lessons learned, including anything you would do differently next time.*

Blockchains and Smart Contracts are important emerging developmental models. Rapid advances are being made in the blockchain world, as evidenced both in the number of research papers and the number of active industrial projects. There has been a huge shift of focus in both academia and the industry toward the new generation of decentralization in software applications on top of the blockchain and smart contracts due to its capabilities of transparency, trust, integrity, and security preserving. Blockchain is a foundational platform and it is expected to be a key enabling

technology to revolutionize a wide range of business activities and interactions considering its economic, political, humanitarian, and legal system benefits.

The main goal of this mini-grant project was to develop supplementary materials and research projects/ use cases for the innovative course (SWE 4490) 'fundamentals of blockchain and smart contracts' that is being offered by the PI in the college of computing and software engineering at Kennesaw State University. The initial version of the course included materials developed in 2018-2019 with not many real-world use cases/projects, and has not seen any major revisions since (this area is a fast-paced emerging area). The new materials cover an update of both content and structure, and support the current learning outcomes for the course by providing more thorough and detailed projects that more closely align with lecture content.

In summary, the experience was very rewarding, and I would like to thank ALG for providing support to this project.

2. Materials Description

- *Describe all the materials you have created or revised as part of this project. These descriptions may be used in the [GALILEO Open Learning Materials](#) repository in the official description field.*

Developed a general framework and templates for deliverables for conducting team development/coding projects. This included a Project Plan, Architecture and Design, Continuous development and testing, and demo templates and guidelines.

Designed four blockchain use cases, including Self-Sovereign Identity and Reputation, Blockchain in Hadoop File System, Blockchain in IPFS file system, and Blockchain for Fake News.

Developed guidelines for conducting research projects in the area of blockchain and smart contract programming.

3. Materials Links

- *If you are hosting your materials in places other than GALILEO Open Learning Materials, please provide these links in this section. Otherwise, leave blank.*

<https://kennesaw.view.usg.edu/d2l/home/1887727>

4. Future Plans

- *Describe any planned or actual papers, presentations, publications, or other professional activities that you expect to produce that reflect your work on this project.*
- *Describe any plans to revise or add to these materials in the future.*

This course is mainly built around the Ethereum (open) blockchain and the use of smart contracts engineering in creating blockchain applications on this platform. The future plan is to include the

materials and projects related to the Hyperledger Fabric blockchain, which is a permissioned blockchain for enterprise solutions.

Two journal papers were published from the indirect results of the research projects in this course, which were impressive achievements.

Paper 1: <https://www.sciencedirect.com/science/article/pii/S1084804519303315>

Paper 2: <https://www.sciencedirect.com/science/article/pii/S0167404818310927>