**BioRubeBot Sandbox Simulator**

**Statement of Work**

For

Dr. Sarah Cline Ph. D. (Athens State University)

2/5/2018

Prepared by CS452 - Senior Software Engineering Project

Instructor: Dr. Adam Lewis

Spring 2018

Statement of Work

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| Date | February 5, 2018 |
| Client | Athens State University |
| Job Name | BioRubeBot Sandbox Simulator |
| Requested by | Dr. Sarah Cline Ph.D. |
| From | Senior Software Engineering Project Team – Spring 2018 |

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| **Revised** | **Description** | **Author** | **Latest Version** |
| 2/5/2018 |  | CS 452 Spring 2018 Senior Project Team | Initial Release – Version 1.0 |

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**Purpose**

This document is designed to specify the project plan needed for developing the BioRubeBot Sandbox Simulator for Dr. Sarah Cline. This is an assignment as the Senior Software Engineering Project for CS452 at Athens State University (ASU). This document's intended audience includes the developers of the BioRubeBot, as well as the stakeholders and other interested parties.

**Scope**

The BioRubeBot project will be an easy-to-use cross-platform sandbox simulator that demonstrates protein interactions within biology. The system is based on a subset of biological rules based on these interactions. We hope to provide a tool for education as well as a possible method to perform experiments in a controlled, virtual environment.

**Requirements**

**General Description**

The current model of education pertaining to intracellular interactions requires much lecture and example, but little interactivity. The goal of the BioRubeBot project is the development of an educational and experiment-based tool, to be used by teachers and students, designed to promote interaction and exploration of concepts. This application will allow its users to take their hypotheses and test them in a virtual, sandbox environment that can be controlled explicitly by its user. With the inclusion of template cellular structures and template cells, the creation of a reactive, experimental environment can be achieved. The user will use a version of the game built on a newer revision of the unity engine 2017.3. The user needs the game to maintain present functionality if changes are made. The user would like incorrect graphics represented for the GTP inside the menu to resemble the true shape of a GTP. The user would like the modularity of the code for other levels to be tested for use with a future level 3.

**User Stories**

* User would like project to be ported to newer version
* User would like graphical menu glitch with GTP to be fixed
* User would like portability of other levels tested for use with a future level 3

**User Characteristics**

Any potential user should be able to successfully use this application. Basic knowledge of current technology preferred.

**General Constraints**

This application must be simple to use, yet be able to exhibit complex interactions within cells. To this end, the user interface must be intuitive, and the rules of the objects and their interactions must be well documented. With these two goals in mind, this application should be simplistic enough to learn 'on-the-fly', yet complex enough to display more intricate experimental interactions.

**Assumptions and Dependencies**

The software functions described herein are dependent upon only the power of the device trying to execute them. It is assumed that this device will be able to run cross -platform, on most devices. It is also assumed that this application will not require any access to any external data, support, tools, or the internet. This application is assumed to be self-sufficient and self-contained. In future implementations, updates may occur that can include: saving of simulations, sharing of simulations, updates from online sources, imports of user-made templates, game-based development, competition-based learning modules, leader-boards, and statistics/data tracking

**Non-Functional Requirements**

**Performance**

The cellular biology rules for all represented objects must be exact in implementation.

**Reliability**

The same simulation must yield the same results consistently.

**Security**

There are no security concerns at this time.

**Maintainability**

Updates to the application must be made upon any change in the rules of the interaction of any represented cellular structures.

**Tentative Iteration Plan**

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| **Review Date** | **First Priority** | **Second Priority** | **Third Priority** |
| February 8, 2018 | Identify and fix issues with port to 2017.3 | Fix previous issues and bugs as time allows | Test reusability of code for level 3 as time allows |
| February 22, 2018 | Continue Identifying and fixing issues with port to 2017.3 | Fix previous issues and bugs as time allows | Test reusability of code for level 3 as time allows |
| March 8, 2018 | Continue Identifying and fixing issues with port to 2017.3 | Fix previous issues and bugs as time allows | Test reusability of code for level 3 as time allows |
| March 15, 2018 | Continue Identifying and fixing issues with port to 2017.3 | Fix previous issues and bugs as time allows | Test reusability of code for level 3 as time allows |
| March 29, 2018 | Continue Identifying and fixing issues with port to 2017.3 | Fix previous issues and bugs as time allows | Test reusability of code for level 3 as time allows |
| April 5, 2018 | Continue Identifying and fixing issues with port to 2017.3 | Fix previous issues and bugs as time allows | Test reusability of code for level 3 as time allows |
| April 22, 2018 | Finalize Identifying and fixing issues with port to 2017.3 | Finalize fixes for previous issues and bugs as time allows | Finalize testing reusability of code for level 3 as time allows |
| April 26, 2018 | Final presentation with project ported to Unity 2017.3 | Final presentation with issues and bugs fixed as time allowed | Final presentation explaining reusability of code for level 3 as time allowed |