Statement of Work

ITE 452 Spring Semester 2022

Project:	BioRube Bot Mobile Game	
Team Members:	Christine Byrd, Alyson Mosely	
Team Sponsor:	Katia Maxwell	
Application Owner:	Dr. Sara Cline	
Revision Number and Date:	Version 3	February 10, 2022

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Scope

This project will be a continuation of past work that has been done in the area of Educational Game Development for Dr. Sara Cline in the Biology department. Past work has not only led to the development of a mobile educational game but has also allowed faculty and students to publish research with the Association of Computing and Machinery (ACM). A team of students will be assigned to work with Dr. Cline in the Spring 2022 semester to continue on work done during the Fall 2021 semester. This application project will run until its completion and final presentation in May of 2022.

Requirements

The work of the Fall 2021 team on the BioRube Bot Project was to (1) update the game to be compatible with the current operating system updates for iPads, (2) merge the final two levels into one as players have found the levels to be too easy, (3) and lastly create a new level based on G-Protein Signaling Video. The current Spring 2022 team has been requested by Dr. Cline to do the following tasks:

1) Modularize existing and future code
2) Debug the transcription regulator to prevent it from freezing
3) Update the Adenosine monophosphate (AMP) to be mono with one white dot
4) Debug cAMP leaving.
5) And lastly update the menu

Tasks

- Refactor and modularize existing code.
- Debug the transcription regulator in Level 2 to prevent it from freezing.
- Update the Adenosine monophosphate (AMP) to be mono with one white dot.
- Make the menu in both/all levels scrollable or place on grid for future expansion.
- Add cAMP onto the menu.
    - Ensure all objects in the game are available in the menu. (So that the names may be read)
- Update documentation for the game.

Secondary Tasks

- Add a new level to the game – introduce concept ‘inhibition of molecules and failure states.
    - Add an additional kinase of TBD name that targets G-Coupled receptors.
    - Add an additional signaling molecule of TBD name that 'speeds up':
      ATP consumption OR Phosphorus drop OR Both OR TBD

Product Functionality

The product shall be in a working state, with an updated menu, with additional functionality added to level 2 (G-Protein Signaling), with cleaner code, and with work or planning started on the third level based on the inhibition of molecules.

Non-Functional Requirements

1. Performance – The game will run more smoothly than the previous version.
2. Reliability – The goal is to limit crashes and/or new bugs/glitches.
3. Availability – The game will be made available in some way.
4. Security – Limit any compromised cases based on ethics and copyright laws.
5. Maintainability – Make the code/graphics easier to manage should anything need changing.

Resources

The Spring 2022 BioRube Bot team will be using the Unity program as well as the C# programming language to develop and test the additions to the aforementioned mobile game. Additional needed assets will be created with various graphic design programs and Blender as needed. Additional audio assets will be recorded or sourced as needed. Work will be uploaded to GitHub, and communications will be facilitated through Discord.

Project Plan Outline

1. Initial Setup
   - Gain access to the source code and Unity project files for the mobile game in GitHub
   - Create Discord group for communication
   - Meet with Dr. Cline to get exact specifications for how to expand on the application
   - Get the game working on our machines.

2. Design Phase
   - Ensure that all team members have access to Unity
   - G-Protein Signaling Level
     - Identify needed assets
     - Identify needed code

        - Identify overall game design ideas and make sure level is compliant
        - Identify all additional requirements and specifications given by Dr. Cline
    - Identify code that is reused and should become part of a library function.

3. Build Phase
    - Identify problem points in the existing G-Protein Signaling level code.
        - AMP
        - cAMP
        - Transcription Regulator
    - Refactor existing code
        - Object selector menu
        - Reused code should be modularized into library functions or scripts
    - Start on a new level to the game if requested.

4. Testing
    - Develop a testing plan to ensure that the application will operate well under any conditions.
    - Write test cases showcasing individual functions and methods.
    - Write test cases showcasing possible interactions between objects.
    - Write test cases showcasing user stories compliance.
    - Test the application as thoroughly as possible to ensure smooth operation
    - Fix any bugs or problems encountered and continue testing until it is in a shippable state

5. Present fully developed application

Monitoring and Quality Assurance

Group members will meet weekly to assess progress as well as create plans for upcoming weeks. They will also meet with Dr. Cline periodically for input and feedback. Testing will occur regularly as developments are made to ensure that the application is functional and operating well. This will result in a final testing check before the final presentation.

Timeline of Project

Milestone	Time Period	Projected Time
Initial Setup/requirements gathering	Jan 10 - Jan 16	1 Week(s)
Create design and test documents	Jan 18 - Jan 30	2 Week(s)
Sprint 1 Presentation	Jan 31	
Test and debug level 2	Feb 2 - Feb 23	3 Week(s)
Update the menu for the levels	Feb 24 - Mar 10	2 Week(s)
Sprint 2 Presentation	Mar 14	
Create new level/assets	Mar 11 - Apr 1	3 Week(s)
Testing and debugging new level/assets	Apr 4 - Apr 18	2 Week(s)
Update documentation	April 19 – April 25	1 Week(s)
Sprint 3 Presentation	April 22	
Set up for Final Presentation	Apr 25 - Apr 26	
Projected duration of project		15 weeks

Note: these are projected times and are subject to change due to any unforeseen circumstances or complications that may arise.

User Stories

- As a Sponsor, I want the game to educate people on biology mechanisms entirely through actions and the names of the game objects.
- As a Sponsor, I do NOT want there to be any necessary reading or text dumps.
- As a Sponsor, I wish to test the game with other people and determine their responses.
- As a User, I want there to be a smooth learning curve.
- As a User, I want to have fun playing this game.
- As a User, I want the game to operate smoothly and with no hiccups.
- As a Developer, I want to quickly be able to change or add to the game.
- As a Developer, I want the documentation to be accurate and thorough.

Agreement of Project Requirements

By signing this Statement of Work, you agree that the tasks that are currently listed in the document fulfill all the requirements and expectations associated to the project at hand. Once approved sponsors can make requests for additional tasks to be added to the project, however the team is not able to guarantee their completion within the given time frame. If there is any disagreement or additional requirements that must be added to the SOW those changes must be documented before this agreement is signed. The SOW currently fulfills the minimum expectations and requirements of the overseeing faculty member.

Approver Name	Role	Signature	Date mm/dd/yy
Sara Cline	Sponsor	Sara Cline	3/30/22
Katia Maxwell	Faculty		
Christine Byrd	Developer	Christine Byrd	3/29/22
Alyson Mosely	Developer	Alyson Mosely	3/27/22