Tetra (Tetranucleotide Frequency Viewer) Mobile Application

Software Project Management Plan

Version 1.1
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Prepared by:
Aaron Chamberlain
Adrian Osuna

CEO:
Dr. Arturo Concepcion

1 Overview

1.1 Project Summary

1.1.1 Purpose

This Software Project Management Plan outlines the management of the mobile application “Tetra” and it’s development for the first iteration of the project. It contains organization, development cycle plans, expected process timeline, testing protocols, and maintenance details for the application for the later group. Its intended audience is our CEO, Dr. Concepcion, as well as our application client, Dr. Jeremy Dodsworth.

1.1.2 Scope of the Project

The scope of this plan encompasses the development of the mobile application “Tetra”, and how it will benefit our clients research workflow. It outlines what will be done, who will do what, and the methods that we will adopt to ensure the first iteration is successful. Anything not directly related to application development as specified in the current SRS to be considered outside of project scope. These include:

- Application Development
- Quality Assurance
- Documentation

The first prototype will consist of a 2-D graph, some of the gestures, a fully implemented layer view, as well as the additional information overlay. The second prototype will consist of a 3-D graph, all of the gestures, and the graph animation overlay.

1.1.3 Assumptions and Constraints

We make the following assumptions:

- All of the team members are following the approved SRS and SPMP.
- The client will provide timely responses to our inquiries.
- Team members will attend lab meetings.
- Team members will dedicate time outside of class for development of the project.
- All the team member will meet scheduled deadlines with their assigned tasks.
- All team members will work on their own devices, as approved by the project managers.
- The application must be designed to run on Android tablets.
- Short time frame for development.
- Team members will work with the managers to learn the required technologies.

1.1.4 Schedule and Budget Summary

No budget was given to this project, however the following deadlines have been established, Prototype 1 is due on the week of February 22, and Prototype 2 is due on March 23rd.

1.1.5 Project Deliverables

1. SRS, SPMP, SQAP, Software Architecture, Detailed Design, Test Plans, Documented Source Code, and Maintenance Manual.
2. Executable app.

1.2 Evolution of the Plan

All the team member attended to the meeting with our client, Dr. Jeremy Dodsworth during our regular lab meeting on January 20th, 2016. We discussed the requirements for the app. Dr. Dodsworth along with three other Bioinformatics students agreed to handle the data manipulation algorithm. We agreed on the major features of the app and what would be useful to him in his research. We drafted a basic UI and presented it to him in another meeting where he liked the idea. At our next meeting this design was finalized and several major milestones were created and dates were created for each. The project manager and assistant project manager wrote the SPMP and turned it into Dr. Concepcion for approval meanwhile other members continued to research their particular topics and coding non-standardized applications to understand Android concepts.

2 References

- IEEE. *IEEE Std 830-1998 IEEE Recommended Practice for Software Requirements Specifications.* IEEE Computer Society, 1998.
- Eric Holland, *Software Project Management Plan for "Campus Safety Mobile App"..*

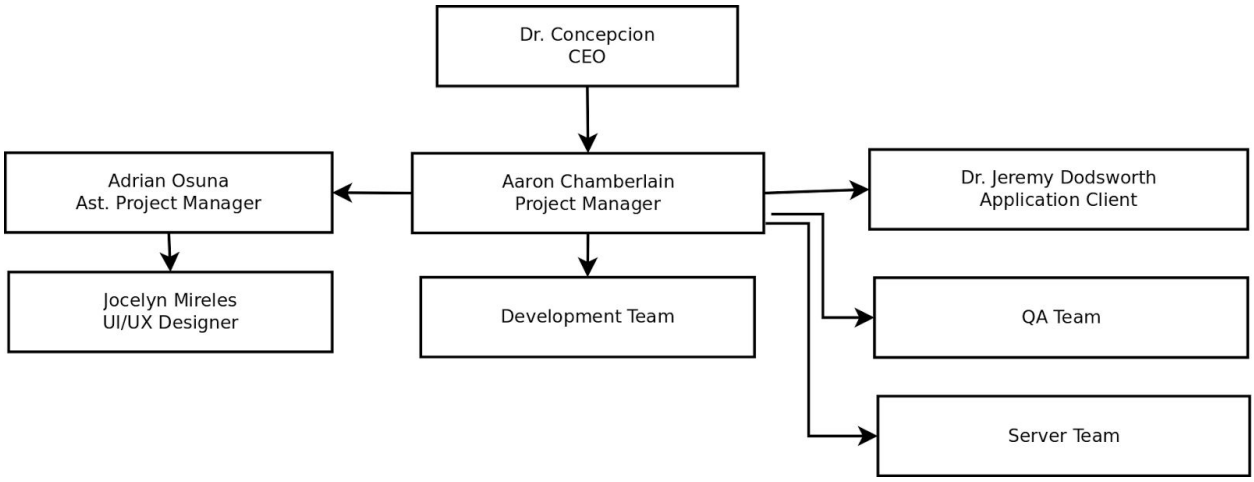
3 Definitions, Acronyms, and Abbreviations

Android	Google's mobile operating system
Android Studio	Google's IDE for android development
OpenGL ES	Cross-platform API for 2D & 3D graphics rendering
IDE	Integrated Development Environment

3G	Third generation of wireless data standard
4G	Fourth generation of wireless standard, typically LTE or HSPA+
HTTPS	Secure transfer protocol for server communication
Java	The language used for Android development
WiFi	Wireless internet for devices
SRS	Software requirement specifications
SDK	Software development kit provided by a vendor
Multi-FASTA Format	A text file format for representing nucleotide sequences.
Tetranucleotide	A codon which contains four nucleotides.
Genus	A taxonomy term to denote different branches of a species.
Copy Number	The number of times a particular tetranucleotide segment was present in sequenced data.

4 Project Organization

4.1 External Interfaces



Dr. Concepcion (CEO) – Monitors performance of all the development teams. Gives guidance to the project manager, comments on the team's documents, and heads all board meetings where progress reports are given.

Aaron Chamberlain (Project Manager) - Liaison between the team and CEO and the client. Produces a work environment where everyone on the team has what they need to do their part as efficiently as possible.

Dr. Jeremy Dodsworth (Client) - Provides information on what the software requirements are, and gives feedback into how well the delivered prototypes meet those requirements.

Adrian Osuna (Assistant Project Manager) – Monitors the performance of each programmer in relations to the scheduled deadlines, is an integral part in all document preparation, attends board meetings, client meetings, and knows everything about the project so he can replace the project manager in the event the project manager cannot perform his duties.

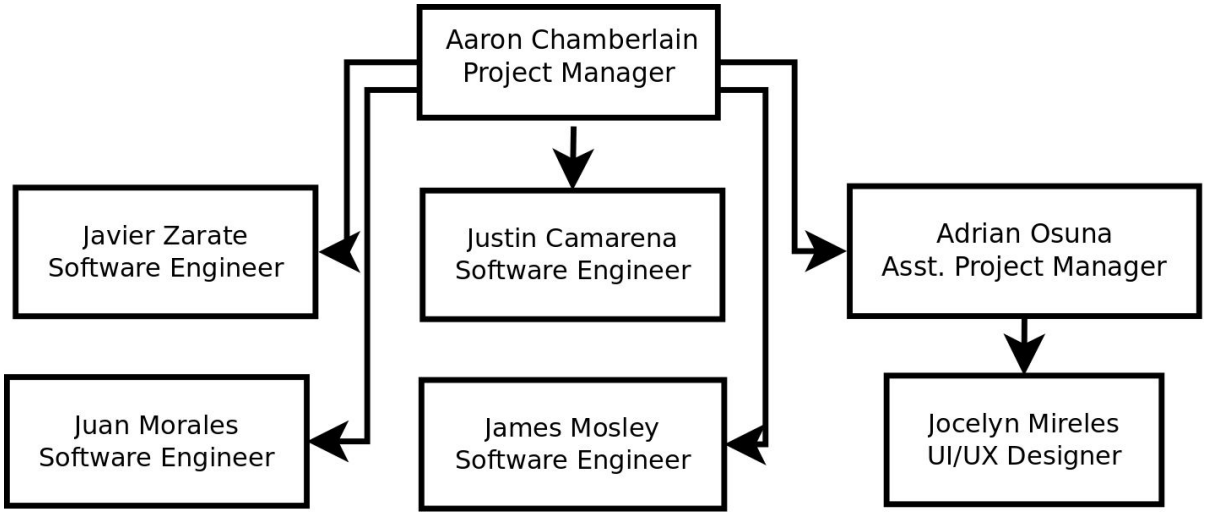
Jocelyn Mireles – Plans the layout and functions of the app. Reports to assistant project manager.

Development Team – Codes the objects in the app. Reports to the project manager.

Server Team – Provides a stable work environment for those on the programming team that require an environment outside of their own local machines.

QA Team – Tests the product for any flaws and gives the results to the development team for debugging or gives their approval.

4.2 Internal Interfaces



The Project Manager and the assistant project manager will work together commutatively to observe project progress and adapt team member roles to ensure project success.

4.3 Roles and Responsibilities

Aaron Chamberlain (Project Manager) - Liaison between the team, and CEO, and the client. Produces a work environment where everyone on the team has what they need to do their part as efficiently as possible.

Adrian Osuna (Assistant Project Manager) – Closely monitors the team's progress, is an integral part in all document preparation, attends board meetings, client meetings, and knows everything about the project so he can replace the project manager in the event the project manager cannot perform his duties. Works directly with Design team to produce a pleasant looking design for application.

James Mosley – Software Engineer assigned to work on the file I/O of the application as well as the Gestures that will allow the manipulation of the 3-D graph.

Juan Morales - Software Engineer assigned to draw the 3-D graph in which the data will be viewed. He will be temporarily assisted by Justin Camarena in setting up the calculation system needed to graph the data.

Justin Camarena - Software Engineer assigned to work with Juan Morales on the graphing system. He is also responsible for the File I/O of the application.

Javier Zarate - Software Engineer responsible for the identification of each layer in the graph, as well as optimizing the graph for real-time motion.

Jocelyn Mireles – Artist for the User Interface. Designs the background and icons. Works directly under the Project Managers combined, to ensure that application has a clear user interface and is aesthetically pleasing.

5 Managerial Process Plan

5.1 Start-up Plan

1. Meeting with client: client has specified the functionality of the application and what requirements must be met.
2. Technology Research: Each member of the team has been assigned their responsibilities and is researching, with the guidance of the project managers, their individual topics.
3. Environment Set Up: Each programmer has set up a copy of Android Studio on their computers, and each system was shown to be free from error to the project managers.
4. Design Overview: Each team member's programming responsibilities has been documented and planned.

5.1.1 Staffing Plan

Members working on this application were all selected and assigned through the screening survey taken during the first week of the course.

5.1.2 Resource Acquisition Plan

The team will be working on their own personal computers, and as necessary will use the readily available computer labs in the Jack Brown Building. Android Studio has been installed on each of these machines and is capable of compiling our work output. All testing will be done on their own individual Android devices. We have also been assigned a Nexus 10 by Dr. Concepcion that has been assigned to Justin Camarena and will serve as the final test bed for all demonstrations and final use of the application. The included emulator in Android Studio will not be used as the heavy OpenGL ES environment that we will be simulating simply will not run on such a system.

Additional meetings may be called outside of the regular class hours if the workload requires such a meeting. All programmers have provided a list of available times such that a meeting could be called at any time that they are available. All additional requests for resources will be handled by the Project Managers.

5.1.3 Project Staff Training Plan

All programmers will be required to learn on their own time the skills needed of their position. They will be provided with links to learning examples by the managers, but further research may be necessary. Progress of both learning and programming will be checked weekly.

Training for the entire team will take place at discretion of the Project Managers in the case that the subject matter is of importance to each team member. If the Project Managers are unable to give clarification on topics, any of the class TA's will be available to receive these same questions.

Some of the links that have given to the team members are:

- Pro Git by Scott Chacon and Ben Straub: https://git-scm.com/book/en/v2
- Lynda (all CSUSB students have accounts): https://weblogon.csusb.edu/cas/login?service=https%3A%2F%2Fidp.csusb.edu%2Fidp%2FAuthn%2FRemoteUser
- Android Developer Refference: http://developer.android.com/guide/index.html

5.2 Work Plan

5.2.1 Work Activities

Graphic Design: Icons, styles, layout, and User Interaction Flow
Assigned: Jocelyn Mireles, Adrian Osuna, Aaron Chamberlain

Prototype: Early working version of the application.

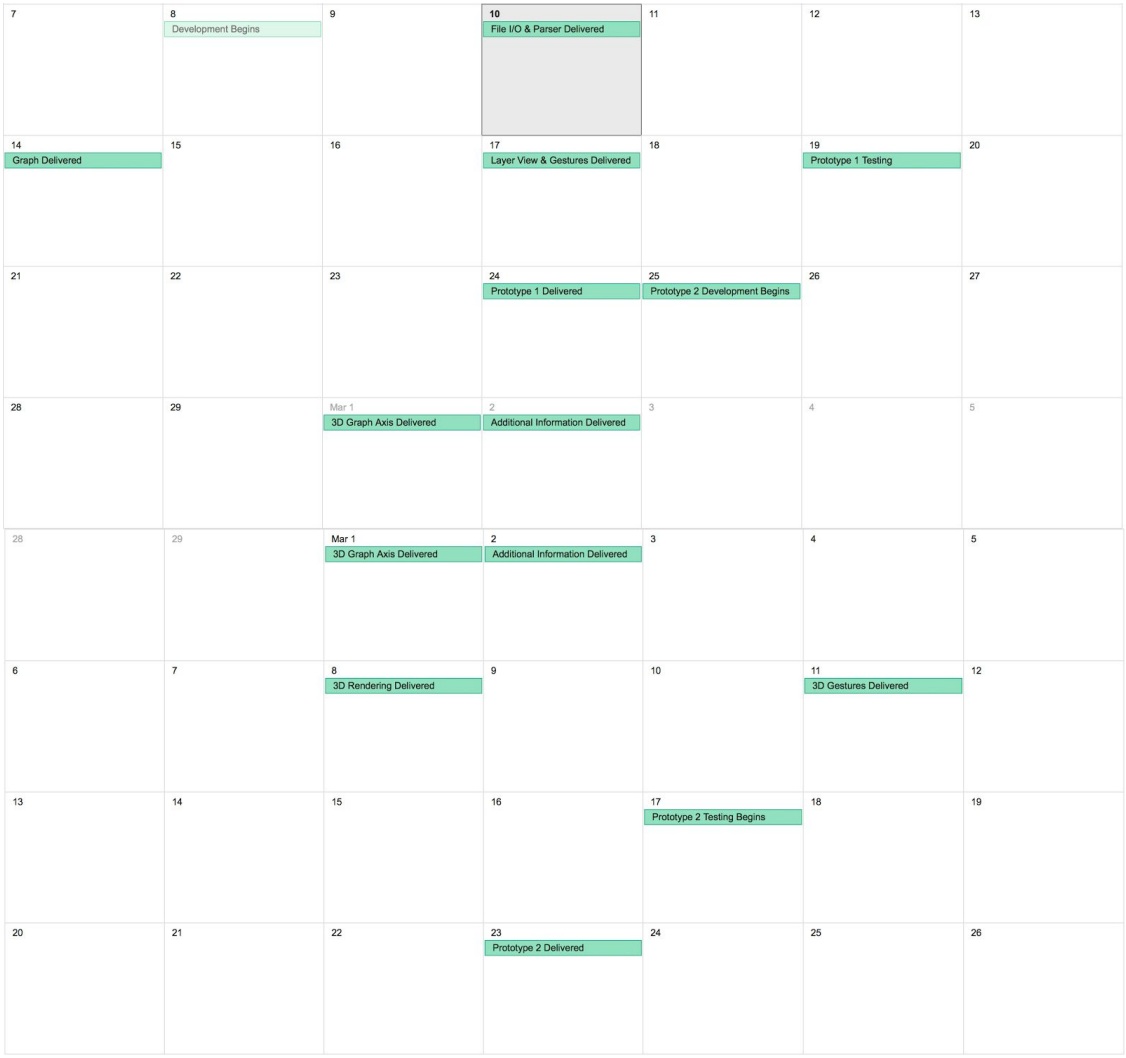
File I/O: James Mosley, Justin Camarena
Graphing: Juan Morales, Javier Zarate
Layer Manipulation: Javier Zarate
User Interactions/Gestures: James Mosley
Animation of Graph: To be decided 2 weeks prior to the start of feature.
Information View: To be decided 2 weeks prior to the start of feature.

Documentation: Code documentation, including UML diagrams as well as commented source code.

Assigned: All team members, with respect to their work as listed above.

5.2.2 Schedule Allocation

All important dates will be made available on a Google Calendar so that each team member may see it. Any changes will immediately be reflected there, and in revisions to this document. The calendar can be found here: http://bit.ly/455tetra



5.3 Control Plan

5.3.1 Requirements

Team members will meet on the two given lab days to show the status of their assigned work unit. The client will be updated on the applications prototype on a 3 week basis. New unimplemented requirements requested by the client will be assessed between Managers. The Managers will establish a plan of how each of the new features will be brought into the application.

5.3.2 Schedule

Dr. Concepcion will follow the progress of the prototype through the team's Google Drive account. Meetings outside of the regularly assigned labs may occur to ensure the project is making progress. Managers will be in contact with the programmers and designer to verify their work is progressing. Project Managers will be in contact with each other on a regular basis, and each will have a working knowledge of the status of the project.

5.3.3 Quality

The quality of work will be assessed regularly in meetings by counting the number of errors per thousand lines of code, as well as logging each programmer's progress and attendance record to the meetings.

5.3.4 Reporting

Dr. Concepcion will have regular meetings with the managers to hear oral explanation of the progress of the project. Dr. Concepcion will use the team Google Drive to monitor the rest of the project at his discretion. Team members will report to the regular bi-weekly labs and will keep in contact with the managers via email.

5.3.5 Metrics Collection

Programmers have been asked to keep track of their hours spent on the project, but this will only be reported at each Prototype delivery date.

5.4 Risk Management Plan

Development:

- Programmers have been encouraged to ask anyone on the team for help, whether it be the project managers, or their fellow programmers.
- Weekly status updates will be given to ensure adequate progress in being made.
- Team members will be in constant contact.

Project Failure:

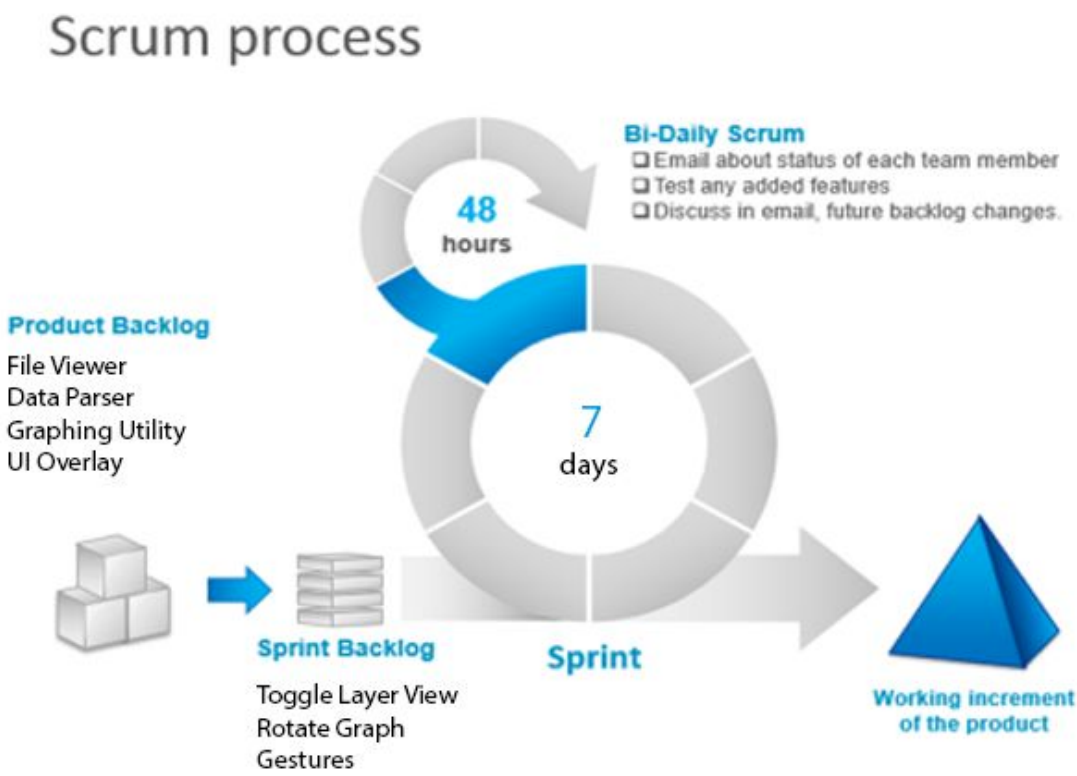
- Project failure will be decided among the managers and the client. If the original software requirements cannot be met, a new set of requirements will be determined and will become the new standard. Some auxiliary features may be removed to ensure the main product is functional, but only on agreement from the client.

5.5 Closeout Plan

- The project will be presented on Finals day, after this all information such as the documentation and source code will be stored in the provided repository and a maintenance manual will be provided which will consist of the UML diagrams created by the programmers themselves.

6 Technical Process Plan

6.1 Process Model



The team will use a form of the SCRUM process to meet the required deadlines. Three distinct roles allow the process to function.

Application Client: Dr. Jeremy Dodsworth

Scrum Master: Aaron Chamberlain

Development Team: James Mosley, Javier Zarate, Justin Camarena, Juan Morales

The entire application specification has been split into several smaller features, and these have been assigned to programmers as listed above in section 5.2.1. These features have been divided such that they could be completed in one week's time. Each week in the required meetings, the programmers will discuss their progress and whether or not they need further assistance. If this is found to be the case, the task will be divided into even smaller segments and assigned to other team members for completion in the following week's sprint.

6.2 Methods, Tools, and Techniques

Methods:

- Weekly Planning Meeting to assign tasks.
- Weekly SCRUM meeting to hear individual progress.
- Assess need of refinement to plan.
- Assign any changes to the plan to keep with the pre-designed schedule.

Tools:

- Android Studio - for developing the application.
- Dia - for drawing all required UML diagrams.
- Google Drive - to reference the SRS, SPMP, and all UML diagrams.
- Gitlab - to manage all of the code that the programmers will produce.

6.3 Infrastructure Plan

The server team will provide access to the GitLab service, and any additional environment needs that the programmers may need.

Once the final prototype has been delivered, the continued maintenance and development will be assessed and planned with Dr. Concepcion.

6.4 Product Acceptance Plan

Programmers will run unit tests on the code that they produce. Both the client and the Quality Assurance team will test the prototypes and look for all of the following:

- Bugs that make the application crash.
- Security Vulnerabilities
- Functional Completeness
- Response time/lag.

7 Supporting Process Plan

7.1 Configuration Management

The GitLab service provides the team with access to the git service, and will allow the management of all project deliverables. All such deliverables will be considered configuration items and will be managed by the system.

7.2 Documentation

Documentation for SRS, SQMP, and SPMP will be prepared by the manager and assistant manager. Documentation for Detailed Design and Architecture will be prepared by development team members.

Documentation will be written in a standard format as the last step of the project. Documentation will be reviewed by team leaders.

7.3 Quality Assurance

In order for the project to be assessed by the client and QA team, the product will be delivered before the actual final date of the project.

7.4 Reviews and Audits

Every team member will submit their logged hours and data for final review before the final deliverable date. Code and design reviews will occur sporadically throughout the quarter and will be officially submitted at the end of the project.

7.5 Problem Resolution

Team members have been asked to be open about any problems they are experiencing with the project, in regards to any subject matter. Project managers will respond to each of these problems and ensure that any changes to the given plans benefit all members of the team.

7.6 Process Improvement

There are many features that can be added in later iterations of this project, features to put off will be decided by the management team.

Team members will be asked to regularly report their progress, and in this way allow the project managers to assess any changes that may be necessary.