*Leaf Disk Analyzer*

project charter

Version *1.0*

*01/28/2019*

VERSION HISTORY

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Version #** | **Implemented**  **By** | **Revision**  **Date** | **Approved**  **By** | **Approval**  **Date** |
| 1.0 | *Kyle Sargent* | *1/28/2019* | *Dr. Razib Iqbal* | *TBD* |
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# Introduction

## Purpose of Project Charter

The Leaf Disc Pathogen Analyzer project charter documents and tracks the necessary information required by decision maker(s) to approve the project for funding. The project charter will include the needs, scope, justification, and resource commitment as well as the project’s sponsor(s) decision to proceed or not to proceed with the project.  It is created during the Initiating Phase of the project.

The intended audience of the Leaf Disc Pathogen Analyzer project charter is the project sponsor and senior leadership.

# project And Product Overview

The team of Emily Box, Colton Eddy, Erica Gitlin, Connor Jansen, Kyle Sargent, and Alex Wilson, hereafter referred to as Group 2, will be assisted and instructed by Dr. Razib Iqbal and working with Dr. Laszlo Kovacs from Missouri State University to work on and develop a specialized software. This software will be able to analyze pictures of grade leaf disks and return a ratio of how much of the leaf disk is infected with a specific pathogen. The project will be worked on from January 16th, 2019 to May 6th, 2019 and has no allocated budget or funds.

# Justification

## Business Need

A program, using image analysis, to quantify the amount of downy mildew (Plasmopara viticola) growing on grapevine plants will assist in the ability to determine which genes in the plant will lead to higher resistance against the pathogen. If the gene leading to this resistance can be determined, this can lessen the loss in the wine production business that is caused by this mildew. This will also lessen the amount of harmful chemicals businesses need to use to get rid of this mildew, which cuts out the cost of these chemical while also causing less damage to the environment.

## Public Health and Business Impact

This system will collect numerical information based on the photos provided to quantify the amount of downy mild present of various types of grapevine plants. This will facilitate in the research for the cause of higher resistance in some plants over others

# Scope

## Objectives

*To help with reducing the loss of grape production by creating a software that will analyze images of grapevine leaves and quantify the amount of mildew growing on them. This will help in determining how resistant the plant is to this pathogen.*

The objectives of the *Leaf Disk Pathogen Analyzer* are as follows:

* *Determining the amount of mildew that is present.*
* *Detecting patterns in the growth of the mildew*
* *Tracking data of all given samples.*

## High-Level Requirements

The following table presents the requirements that the project’s product, service or result must meet for the project objectives to be satisfied.

|  |  |
| --- | --- |
| **Req. #** | **I Requirement Description** |
| 1.Uploading files | The system must allow users to upload at least 8 files. |
| 2.Processing files | The software must be able to process all uploaded files simultaneously. |
| 3.Bacteria patterns | The system must detect if the bacteria is growing in clusters, spontaneously, along the veins, or along the edges of the leaf. |
| 4.Bacteria amount | The software must determine the total surface area of the leaf in which bacteria is present. |
| 5.Tracking data | The system must allow the user to transfer results of analysis to a spreadsheet. |

## Major Deliverables

The following table presents the major deliverables that the project’s product, service or result must meet for the project objectives to be satisfied.

|  |  |
| --- | --- |
| **Major Deliverable** | **I Deliverable Description** |
| Functional Application | An easy-to-use, GUI-Based software system that allows the user to upload files, process them, and receive accurate results. |
| Data storage | A spreadsheet where all data is to be recorded and can easily be transferred from the application. |
| User’s manual | Documentation on how to use and maintain the software. |

## Boundaries

Items that are out of scope would include image analysis in real-time, identifying other types of bacteria that may be growing on the leaves, Identifying bacteria on plants other than grapevine leaves.

# Duration

## Timeline

1/17

1/18

2/11

04/15

System Development

Completed

Working prototype

Requirements meeting

with Dr. Kovacs

Meeting with Dr. Iqbal

demo

## Executive Milestones

The table below lists the high-level Executive Milestones of the project and their estimated completion timeframe.

| **Executive Milestones** | **Estimated Completion Timeframe** |
| --- | --- |
| Meeting with Dr. Iqbal to discuss how to proceed with the assigned project. | Completed January 17, 2019. |
| Meeting with Dr. Kovacs, the client, to determine requirements and expectations for the Leaf Disk Pathogen Analyzer. | Completed January 18, 2019. |
| Develop prototype demo | We can expect to have a working prototype by mid-February, though it will likely have some bugs to be worked out and may or may not be feature complete. |
| System Development Completion | The Leaf Disk Pathogen Analyzer should be finished and ready to ship by mid-April. |

# 

# Assumptions, Constraints And Risks

## Assumptions

[Example: The system is being developed to capture data from public health partners. One assumption is that data is entered electronically into the system.]

This section identifies the statements believed to be true and from which a conclusion was drawn to define this project charter.

1. [Insert description of the first assumption.]
2. *[Insert description of the second assumption.]*

## Constraints

[Example: There might be time constraints on developing a system that is used to track data of highly infectious diseases like SARS.]

This section identifies any limitation that must be taken into consideration prior to the initiation of the project.

1. *[Insert description of the first constraint.]*
2. *[Insert description of the second constraint.]*

## Risks

[Example: The risk of accessibility or unavailability of public health partners for obtaining requirements to develop a data collection system may delay project deliverables. A possible mitigation strategy might be to schedule requirement sessions with the partners as early as possible. List the risks that the project sponsor should be aware of before deciding on funding the project, including risks of not funding the project.]

| **Risk** | **Mitigation** |
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# Project Organization

## Roles and Responsibilities

This section describes the key roles supporting the project.

| **Name & Organization** | **Project Role** | **Project Responsibilities** |
| --- | --- | --- |
| Dr. Razib Iqbal  Missouri State University | Group Instructor | This person(s) will be responsible for providing initial constraints to the project, for providing feedback on the project at different stages, and for providing needed assistance to the Developers. |
| Dr. Laszlo Kovacs  Missouri State University | Customer/Subject Contact | Person(s) who will be responsible for outlining all other requirements and constraints for the project, for coordination with the Developers, and for providing needed expertise on the subject matter when it falls outside the Developers knowledge. |
| Kyle Sargent | Repository Officer | Person who is and has been responsible for consolidating and setting up files related to the project, including but not limited to a file repository, the charter outline, list of requirements and restraints, etc. |
| Alex Wilson | External Communication Manager | A Developer responsible for maintaining and initiating contact with the Customer and any other individuals outside of the project team, and for relaying any communication from them back. |
| Connor Jansen | Project Manager | Developer responsible for assigning roles to other developers, delegating tasks, and ensuring internal communication within the project team. |
| Emily Box, Colton Eddy, Erica Gitlin, Connor Jansen, Kyle Sargent, and Alex Wilson | Developer | Person(s) responsible for developing, innovating, and designing the many different aspects of the software. |

## Stakeholders (Internal and External)

The stakeholder(s) for this project include Dr. Laszlo Kovac.

# project Charter approval

The undersigned acknowledge they have reviewed the project charter and authorize and fund the *<Project Name>* project. Changes to this project charter will be coordinated with and approved by the undersigned or their designated representatives.

[List the individuals whose signatures are desired. Examples of such individuals are Business Steward, Project Manager or Project Sponsor. Add additional lines for signature as necessary. Although signatures are desired, they are not always required to move forward with the practices outlined within this document.]

|  |  |  |  |
| --- | --- | --- | --- |
| Signature: |  | Date: |  |
| Print Name: |  |  |  |
| Title: |  |  |  |
| Role: |  |  |  |

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| Signature: |  | Date: |  |
| Print Name: |  |  |  |
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| Signature: |  | Date: |  |
| Print Name: |  |  |  |
| Title: |  |  |  |
| Role: |  |  |  |

APPENDIX A: REFERENCES

The following table summarizes the documents referenced in this document.

|  |  |  |
| --- | --- | --- |
| **Document Name and Version** | **Description** | **Location** |
| *diskAnalyzer.py*  *v1.0* | *This is the main python program that will do analyzation of the disk photos, produce the output and report found data into an Excel Spreadsheet.* | *This can be found at:*  *https://github.com/KySarge23/LeafDiskAnalyzer/blob/master/code/diskAnalyzer.py* |
| *Project\_Charter\_LeafDiskAnalyzer.docx* | *This is the group’s project charter which explains the purpose, roles, concerns, risks, constraints, milestones, and more.* | *This can be found at:*  *https://github.com/KySarge23/LeafDiskAnalyzer/blob/master/documents/Project\_Charter\_LeafDiskAnalyzer.docx* |
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APPENDIX B: KEY TERMS

The following table provides definitions for terms relevant to this document.

|  |  |
| --- | --- |
| **Term** | **Definition** |
| *OCV/OpenCV* | *OpenCV or OCV which is the Python Library we are using regarding all Image Processing processes that we will be using.* |
| *Python* | *Python is the programming language in which the software will be written in.* |
| *GUI* | *GUI stands for Graphical User Interface and will be the main way the user interacts with the program. This will be how the user what/when to analyze.* |
| *Image Analysis* | *Image Analysis is the technique in which an image is analyzed, or looked at, in order to produce a specific result.* |
| *Downy Mildew (Plasmopara viticola)* | *Downy Mildew (Plasmopara viticola) is the mildew that grows and destroys the leaf disks rendering them useless for grade production. This is what will be analyzed and quantified by the software.* |