Dr. Clark Fitzgerald

PROJECT CHARTER DOCUMENT

Prepared by Senior Project Team

Big Data Energy

College of Engineering and Computer Science
Department of Computer Science

Date: 09/29/2022

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1.0 INTRODUCTION.

This is the Project Charter document for TrashClassifier for Dr. Clark Fitzgerald. This project is being undertaken by the development team Big Data Energy, composed of undergraduate students majoring in Computer Science at California State University, Sacramento. The team members are enrolled in a two-semester senior project course required of all undergraduate majors. Successful delivery of the desired software product will fulfill the senior project requirement for the student team members.

PROJECT PRODUCT OWNER

Name: Dr. Clark Fitzgerald
Title: Assistant Professor
Organization: Mathematics and Statistics Department, CSU Sacramento
Contact Information:
(916)-278-4748
fitzgerald@csus.edu

DEVELOPMENT TEAM - Big Data Energy

Name: Bryan Burch
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Name: Daniel Smagly
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Phone number: (916) 605-6193

Name: Jeffrey de Jesus
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Phone number: (916) 761-2920

Name: Julian Hernandez
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Phone number: (530) 919-6030

Name: Kenta Miyahara
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Phone number: (279)-759-1885

Name: Santiago Bermudez
Email address: santiagoabermudez@csus.edu
Phone number: (916) 640-7754

Name: Travis Hammond
Email address: travishammond@csus.edu
Phone number: (916) 547-4381

1.1 PURPOSE.

The purpose of this document is to describe the details of the project, its rationale, its goals and its participants. In general, this document will create a mutual understanding between the Developers and the Product Owner of what is expected over the course of the project. This document will cover all agreements and expectations that the Developers have for the Product Owner and that the Product Owner has for the Developers. The project to be developed will allow the Product Owner to run a server that can be used to classify trash to web clients.

1.2 OVERVIEW OF CONTENTS OF DOCUMENT.

Section 2.0 PROJECT PRODUCT OWNER AND PRODUCT OWNER NEED.
This subsection identifies the project's Product Owner and describes the Product Owner's "business". After reading these subsections the Product Owner should be convinced that the team has an understanding of the Product Owner's organization and business and therefore the context in which the proposed software is to be used.

Section 3.0 ACADEMIC NATURE OF THE PROJECT.
This subsection contains a variety of issues that need to be documented because of the quasi academic nature of the work done by the Senior Project team.

Section 4.0 PRODUCT OWNER AND THE BIG DATA ENERGY TEAM APPROVALS.
This subsection indicates briefly what specifically is being agreed to. A sign-off sheet should be included which indicates approval of an agreement to the conditions and commitments contained in the Project Charter.

Appendix A.
Appendix A Contains resumes which provide information about the qualifications of each member of the development team.

Appendix B.
This statement is a commitment for the collaboration between Jeffrey de Jesus, Kenta Miyahara, Travis Hammond, Santiago Bermudez, Bryan Burch, Daniel Smagly, Julian Hernandez, and Christopher Allen.

2.0 PROJECT PRODUCT OWNER AND PRODUCT OWNER NEED.

2.1 PRODUCT OWNER IDENTIFICATION.

Dr. Clark Fitzgerald, Assistant Professor at California State University, Sacramento

2.2 PRODUCT OWNER'S "BUSINESS".

Dr. Fitzgerald is a professor in the department of Statistics in the College of Natural Sciences and Mathematics. His goals include furthering the study of computer vision with regard to litter detection and cleanup. Our project will build on previous technology that he's advised for and could enable faster methods for plastic monitoring, and automated waste management. He also sees potential to help educate Sacramento residents on what belongs in the trash, recycling, and compost bins.

2.3 DESCRIPTION OF THE NEED.

The client needs a product to allow end-users to scan images of trash which would then identify and classify articles of trash into the appropriate waste bin that the trash belongs in. The goal for the client in this case is to have accurate trash recognition being computed in the cloud, and investigate being able to run on the smartphone. This product should serve to reduce the effort needed for deciding how to handle waste and hopefully function at a level higher than most humans. It should also be as portable as possible, so that it can run on many different devices.

2.4 ASSUMPTIONS AND CONSTRAINTS.

The project will be developed until May 12, 2023. Development after the stated date is left to the discretion of the Developers. Developers expect to finish the project by the stated date, but in failure to do so, the project shall be delivered as-is with no guarantees.

Developers should not incur any fees or costs during development. Any fees or costs during development are the responsibility of the Product Owner to pay.

The project shall be developed so that it may be run on the Product Owner's own hardware or by using cloud computing. Any fees or costs to run the software are the responsibility of the Product Owner.

The project should at minimum be developed with functionality at focus, working seamlessly as possible on the user's smartphone or computer.

The Developers should be ready to adapt to changes and new technologies when needed and should expect to learn along the way.

(The client is highly encouraged to donate to the Department of Computer Science, at CSUS, to support Senior Project orientation and showcase.)

2.5 LIMITING CONDITIONS.

Developers expect timely and consistent feedback from the Product Owner throughout the development to prioritize requirements, review and approve work done, and to inform the Developers of any changes that might occur.

3.0 ACADEMIC NATURE OF THE PROJECT.

This subsection contains a variety of issues that need to be documented because of the quasi-academic nature of the work done by the Senior Project team Big Data Energy.

3.1 GOALS.

The senior project experience is designed to accomplish two goals:

1) To develop and deliver a software system to the benefit of the Product Owner and user community.
2) To provide the senior project team with a learning experience in which an agile software development methodology (SCRUM) will be used for the development of a Product Owner proposed software system.

3.2 GENERAL DISCLAIMER.

All students majoring in Computer Science at CSUS are required to complete a two semester, senior project. The project proposed, TrashClassifier, is expected to fulfill this requirement for the project team of Jeffrey De Jesus, Kenta Miyahara, Travis Hammond, Santiago Bermudez, Bryan Burch, Daniel Smagly, Julian Hernandez, and Christopher Allen. The intent of senior project and therefore the team is to deliver a high-quality product that meets the Product Owner's expectations.

However, neither the students, faculty adviser, nor CSUS can be held responsible for any errors in the delivered software product, failure to meet any of the specified requirements, or failure to deliver the software.

Furthermore, due to the academic nature of the experience and its requirement for graduation, students cannot be paid for the work associated with the project.

3.3 SUPPORT LIMITATIONS.

Upon completion of the project and delivery of the proposed software, neither the team, Big Data Energy, nor any representative of CSUS is obligated to provide software maintenance or additional support. If additional support is needed, it is at the discretion of the Developers to provide additional support.

3.4 OWNERSHIP OF THE PRODUCT

Jeffrey De Jesus, Kenta Miyahara, Travis Hammond, Santiago Bermudez, Bryan Burch, Daniel Smagly, Julian Hernandez, and Christopher Allen maintain nominal ownership of the software and the Product Owner will receive all specified documentation along with the software, including both source and executable code. Also, the CSUS Computer Science Department reserves the right to use the documentation and product as examples of student work.

3.5 OTHER DISCLAIMERS.

The resulting software should eventually not require a dedicated server to be utilized. The Developers are not responsible for providing a server for the software to run on during development stages. Procuring a server may result in additional costs for the Product Owner.

4.0 PRODUCT OWNER AND THE BIG DATA ENERGY TEAM APPROVALS.
Big Data Energy agrees to develop and deliver, to the best of their ability, TrashClassifier web application that has the general features specified in section 2.3 (subject to change) for the Product Owner, Dr. Clark Fitzgerald. In addition, the Product Owner and Big Data Energy agree to have bi-weekly meetings beginning in September 2022 to discuss the progress of the project and any potential changes that need to be made.

4.1 PROJECT CHARTER APPROVALS.
The following signatories agree to the terms and conditions as specified in the Project Charter.

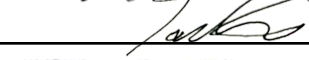
Product Owner (*signature*)**:** 

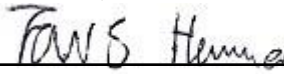
Title: Assistant Professor, CSUS Mathematics and Statistics Dept.

Team Name: Big Data Energy

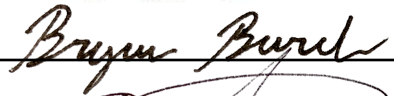
Team members (signatures)**:**

Jeffrey De Jesus: 

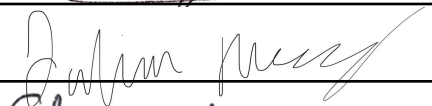
Kenta Miyahara: 

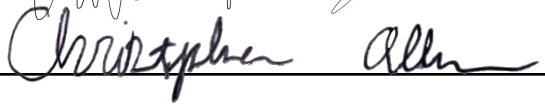
Travis Hammond: 

Santiago Bermudez: 

Bryan Burch: 

Daniel Smagly: 

Julian Hernandez: 

Christopher Allen: 

Date: 10/7/22

APPENDIX A. Project Team Experience.

TEAM MEMBER RESUMES

Bryan Burch

Contact Information:
(661) 800-1630
bburch@csus.edu

Education:
Bachelor of Sciences, Computer Science — Spring 2023
California State University Sacramento

Skills:
Java, Python, MySQL, JavaScript (some React), HTML & CSS, JavaFX, JUnit, Git, Jupyter Notebook, VS Code, IntelliJ, UML

Relevant Coursework:
Software Engineering, DSA, OOP, Testing/QA

Post Graduation goals:
Software developer role at startup/mid-sized company; focus on applications development

Project and Teamwork Experience:
- Garage Parking Reservation App
  - CSC131 team project built using Java; allows user to login and reserve a parking spot from a CSUS parking structure
- HR Health Dashboard
  - Web app allowing employee health input and retrieval from DB; performs basic aggregate report for all or subset of health data.
- Paint Program
  - GUI Java app with MS Paint-like functionality; built using JavaFX; OOP

Awards and Affiliations:
Phi Theta Kappa
Dean's Honor List
ACM

Christopher Allen

Contact Information:
(916) 690-5217
Chriscaa115@gmail.com

Education:

Associates Degree, Computer Science — Fall 2020
Los Rios Community College District

CIS-Programming in C/C++ Certificate of Achievement — Fall 2020
Los Rios Community College District

Bachelor of Sciences, Computer Science — Spring 2023
California State University Sacramento

Skills:

Java, C++, C#, SQL, HTML, CSS, JavaScript

Post Graduation goals:

Find work as a Database Administrator.

Project and Teamwork Experience:

- CSC 131 project building a multiplayer game.
- CSC 174 project building a front-end and back-end for a website.

Daniel Smagly

Contact Information:
(916) 605-6193
danielsmagly@csus.edu

Education:
Bachelor of Sciences, Computer Science Spring 2023
California State University Sacramento

Skills:
Java, HTML/CSS, Javascript, React, PHP, phpMyAdmin, SQL, Python, TensorFlow

Work Experience:
Computer Science Tutor at California State University, Sacramento.
Technical Support Advisor at Apple Inc.

Post Graduation goals:
Machine Learning engineering role at mid to high level corporation.

Project and Teamwork Experience:
Frontend Developer - Vendia Health Dashboard:
Worked in a team of six to develop an easy to use web application that streamlined the process of entering new employee data as well as providing functionalities for visualizing and editing data, created with React and GraphQL.

Lead Developer - Project Construction Stormwater Review Report:
Collaborated in a team of six to create an easy to use, cross-platform application that greatly improved the process of documenting work-site conditions for the California Department of Transportation (Caltrans).

Focused on building a user-friendly interface utilizing React, Material-Ui and Styled-Components in order to reduce the learning curve of application.

Machine Learning Pattern Recognition Application:
Created a simple number pattern recognition tool using user entered data, machine learning, and data visualization with Python and TensorFlow for machine learning functionality along with Matplotlib for data visualization.

Awards and Affiliations:
Dean’s List: Fall 2019 - Spring 2022

Jeffrey de Jesus

Contact Information:
(916) 761-2920
jeffreydejesus@csus.edu

Education:

Bachelor of Sciences, Computer Science — Fall 2019 - Spring 2023
California State University Sacramento
Bachelor of Arts, Mathematics - statistics emphasis — Fall 2019 - Spring 2023
California State University Sacramento

Skills:

Programming Languages: Java, C, Python, Julia, R
Frameworks/APIs: Tensorflow, Keras, NumPy, Pandas, MySQL, Scikit-learn
Tools: Jira, Git, Github, Jupyter Notebook, Google Colab

Work Experience:

Computer Programming Teachers Assistant
Workday Software Application Engineer Intern
CSUS Math Tutor
Sacramento County Sheriff's Office Explorer Program Peer Leader

Post Graduation goals:

Software development and data science

Project and Teamwork Experience:

Intel Codewars Fall 2018
Treehacks Hackathon 2020
ASA Datafest 2022
ICPC CSUS 2022

Awards and Affiliations:

Dean's Honor Roll Fall 2019 - Spring 2022
MESA Engineering Program
Data Science Club Officer

Julian Hernandez

Contact Information:
(530) 919-6030
julianhernandez@csus.edu

Education:

Bachelor of Sciences, Computer Science — Spring 2023
California State University Sacramento
Associate of Sciences, Interdisciplinary Math and Science — Spring 2020
Folsom Lake College

Skills:

Python, Java, Computer vision training

Work Experience:

- Intel - graphics intern
- Intel - NVMe test developer
- CalTrans - Student Researcher
- Intel - Software Intern

Post Graduation goals:

- Graduate School

Project and Teamwork Experience:

- Litter Detection project
- Traffic estimation

Awards and Affiliations:

- McNair scholar

Kenta Miyahara

Contact Information:
(279)-759-1885
kmiyahara@csus.edu

Education:

Bachelor of Sciences, Computer Science — Spring 2023
California State University Sacramento

Skills:

- Python, Java, React JS, R,
- SQL, pandas, numpy, scikit learn
- Jupyter-notebook, vscode, excel, git

Work Experience

- Technical Support Advisor @ Apple

Post Graduation goals:

- Full time job in tech industry then pursuit further learning (Masters degree)

Project and Teamwork Experience:

- CSC 179 vendia health dashboard
    - Developed the backend of the health dashboard using React JS with other teammates.
- DataFest
    - Utilized pandas and numpy to clean and produce relevant dataset to answer questions from sex education game produced by a company.
- Stat 196k big data Machine learning project
    - Worked with USDA food data and used scikit learn to implement machine learning algorithms to predictThe food name based on ingredients list.

Awards and Affiliations:

- Dean’s honor roll Spring 2022

Santiago A. Bermudez

Contact Information:

Phone: (916) 640-7754
Email: santi.2001bermudez@gmail.com
Sac State Student ID: 301118090

Education:

Bachelor of Sciences, Computer Science (Spring 2019-...)
California State University Sacramento

Relevant Coursework:

Intro to Data Structures and Algorithms	Software Engineering	Intro to Programming	Intro to Probability and Statistics
Linear Algebra	Database Management Systems	Computer Networks	Object-Oriented Computer Graphics
Discrete Structures	Programming Languages	Software Testing	Intelligent Systems
Computer Architecture	Java Programming	Quality Assurance	Data Analytics and Mining
Systems Programming		Computer Organization	

Skills:

- Coding: Exposure in C++, HTML Fundamentals, CSS Fundamentals, JavaScript, Java, Python
- Has worked with Github, draw.io, Google Colab, Jira
- Has used IDEs like jGrasp, Eclipse, Thonny, Visual Studio
- Other: Jupyter Notebook

Travis Hammond

Contact Information:
(916) 547-4381
travishammond@csus.edu

Education:
Bachelor of Sciences, Computer Science — Spring 2023
California State University Sacramento

Skills:
Programming Languages: Python 3, Java, C++, C, R
Frameworks/APIs: Tensorflow, Keras, PyTorch, NumPy, Pandas, SQL, Scikit-learn, OpenCV, CUDA
Tools: Git, Gerrit, Jira, Jupyter Notebooks, Excel, Stratifyd

Work Experience:
Research Software Engineer at John Hopkins University Applied Physics Laboratory, Jun. 2022 - Present
SMB Market Data Analytics Intern at Intel, May - Dec. 2021
Systems Validation Engineering Intern at Aruba, HPE, May - Nov. 2020

Post Graduation goals:
Continue in the industry and pursue graduate school

Project and Teamwork Experience:
Disease Forecasting Research with Advisor and previous student work
Utilized novel deep learning models to predict disease
CSC 131 Software engineering practices with a group of 8 individuals
Created a 2D multiplayer rogue-like video game
PAI-Utils - Solo
Created and Published an entire Python Package for AI research

Awards and Affiliations:
Dean's Honor Roll
President of Data Science Club
Member of ACM

APPENDIX B. The following statement of rights and responsibility provides the context for the commitment to collaboration between Big Data Energy and Dr. Fitzgerald.

As a project's Product Owner, you have the right to:

1. Expect the team to speak your language.
2. Expect the team to learn about your business and your objectives for the system.
3. Expect the team to structure the requirements information you present into a software requirements specification.
4. Have the team explain requirements for work products.
5. Expect the team to treat you with respect and to maintain a collaborative and professional attitude.
6. Have the team present ideas and alternatives both for your requirements and for implementation.
7. Describe characteristics that will make the product easy and enjoyable to use.
8. Be presented with opportunities to adjust your requirements to permit reuse of existing software components.
9. Be given good-faith estimates of the costs, impacts, and trade-offs when you request a requirement change.
10. Receive a system that meets your functional and quality needs, to the extent that those needs have been communicated to the team and agreed upon.

As the project's product owner, you have the responsibility to:

1. Educate the team about your business and define jargon.
2. Spend the time to provide requirements, clarify them, and iteratively flesh them out.
3. Be specific and precise about the system's requirements.
4. Make timely decisions about requirements when requested to do so.
5. Respect developers' assessments of cost and feasibility.
6. Set priorities for individual requirements, system features, or use cases.
7. Review requirements documents and prototypes.
8. Promptly communicate changes to the product's requirements.
9. Follow the team's defined requirements change process.
10. Respect the requirements engineering processes the team uses.

Karl E. Wiegers authored these two lists. Each speaks to the need for both the team and the Product Owner to share the responsibility of ensuring the software product that is developed is based on accurate and complete requirements. The two lists along with additional explanations for each item is available at the following web address:

http://www.processimpact.com/articles/customer.pdf.