

Florida International University
Knight Foundation School of Computing and Information Sciences

Software Engineering Focus

Final Deliverable

Project Title: A Novel Edge-based Computer Vision Application for
Workforce Performance Optimization
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Abstract

This document presents the information necessary to gain a good understanding of A Novel Edge-based Computer Vision Application for Workforce Performance Optimization. A Novel Edge-based Computer Vision Application for Workforce Performance Optimization is about creating a web chat application that demonstrates the software of face recognition used in the GuacamoleID application.

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INTRODUCTION

Current System

The purpose of this project is to provide online users a demo experience of how the GuacamoleID Artificial Intelligence for face recognition works. Right now they have a fully functional software that locks users out of their computers whenever the camera stops detecting that user and they wanted to showcase a demo of that engine so that more people are aware of them.

Purpose of New System

The purpose of the new system is to give a wider audience to what Hummingbirds AI is working on, trying to get more people engaged in this kind of systems so that it becomes popular and people talk more about it. We want to generate awareness of this systems so that companies can contact Hummingbirds and use their software to keep track of the time their employees spend in front of computers and also so that the employees have protection against other people trying to steal information from them.

USER STORIES

The following section provides the detailed user stories that were implemented in this iteration of the A Novel Edge-based Computer Vision Application for Workforce Performance Optimization project. These user stories served as the basis for the implementation of the project's features. This section also shows the user stories that are to be considered for future development.

Implemented User Stories

- 1 - As a developer, I want to be able to know what is the output with the minimum input from the requirements of this project.
- 2 - As a developer, I want to be able to develop a prototype of the project dashboard.
- 3 - As a developer, I want to be able to start developing the exemplar models.
- 4 - As a developer, I want to be able to find the drawbacks in making the model.
- 5 - As a developer, I want to be able to analyze case studies with a list of all kinds of vulnerabilities in a system.

- 6 - As a developer, I want to be able to think like a Hacker to identify every entry point in the organization.
- 7 - As a developer, I want to be more familiarized with the frameworks to be used
- 8 - As a developer, I want to study examples of similar projects
- 9 - As a developer I want to work close with my team to make sure everyone is on the same page
- 10 - As a developer, I want to develop a responsive real world front end for the application
- 11 - As a developer, I want to develop a responsive real world back end for the application
- 12 - 1 - As a developer, I want to develop a responsive real world database for the application
- 13 - As a developer I want to work close with my team to make sure everyone is on the same page
- 14 - As a developer I want to document the progress of the team
- 15- As a developer I want to find weaknesses in the infrastructure
- 16 - As a developer, I want to work on the project poster for the showcase
- 17 - 1 - As a developer, I want to work on the final deliverable file for the project
- 18- As a developer I want to find weaknesses in the infrastructure

Pending User Stories

- 4 - As a developer I want to make the front and back end work together

PROJECT PLAN

This section describes the planning that went into the realization of this project. This project incorporated agile development techniques and as such required the sprints to be planned. These sprint plannings are detailed in the section. This section also describes the components, both software and hardware, chosen for this project.

Hardware and Software Resources

The following is a list of all hardware and software resources that were used in this project:

Software:

- Python
- Visual Studio
- CSS
- JavaScript
- React
- Redis
- Django
- PostgreSQL
- Zoom (team communication)
- Google Docs (team sprint planning)
- Whatsapp (team communication)

Hardware:

- Mac OS/Ubuntu OS (Windows possible but not preferred)
- Webcam

Sprints Plan

Sprint 1

- Artificial Intelligence QA: You will be tasked with testing our existing AI systems. You will document the potential vulnerabilities and issues. You can also propose different ways to address these problems.
- Software QA: You will be tasked with testing the app as a whole. You will need to document any bugs that pop up and explain in detail how the bug can be replicated. You can also go into the code and explore how the issue could be fixed.
- Software documentation: You will be tasked with analyzing the code and understanding how it works. You will need to understand how the threads communicate, you will need to understand how the interface works and how it communicates with the AI. You will then use this knowledge to build diagrams and reports on how the app works.

Sprint 2

- 1 - As a developer, I want to be able to know what is the output with the minimum input from the requirements of this project.
- 2 - As a developer, I want to be able to develop a prototype of the project dashboard.
- 3 - As a developer, I want to be able to start developing the exemplar models.
- 4 - As a developer, I want to be able to find the drawbacks in making the model.
- 5 - As a developer, I want to be able to analyze case studies with a list of all kinds of vulnerabilities in a system.

Sprint 3

- 1 - As a developer, I want to be able to think like a Hacker to identify every entry point in the organization.
- 2 - As a developer, I want to be more familiarized with the frameworks to be used
- 3 - As a developer, I want to study examples of similar projects
- 4 - As a developer I want to work close with my team to make sure everyone is on the same page

Sprint 4

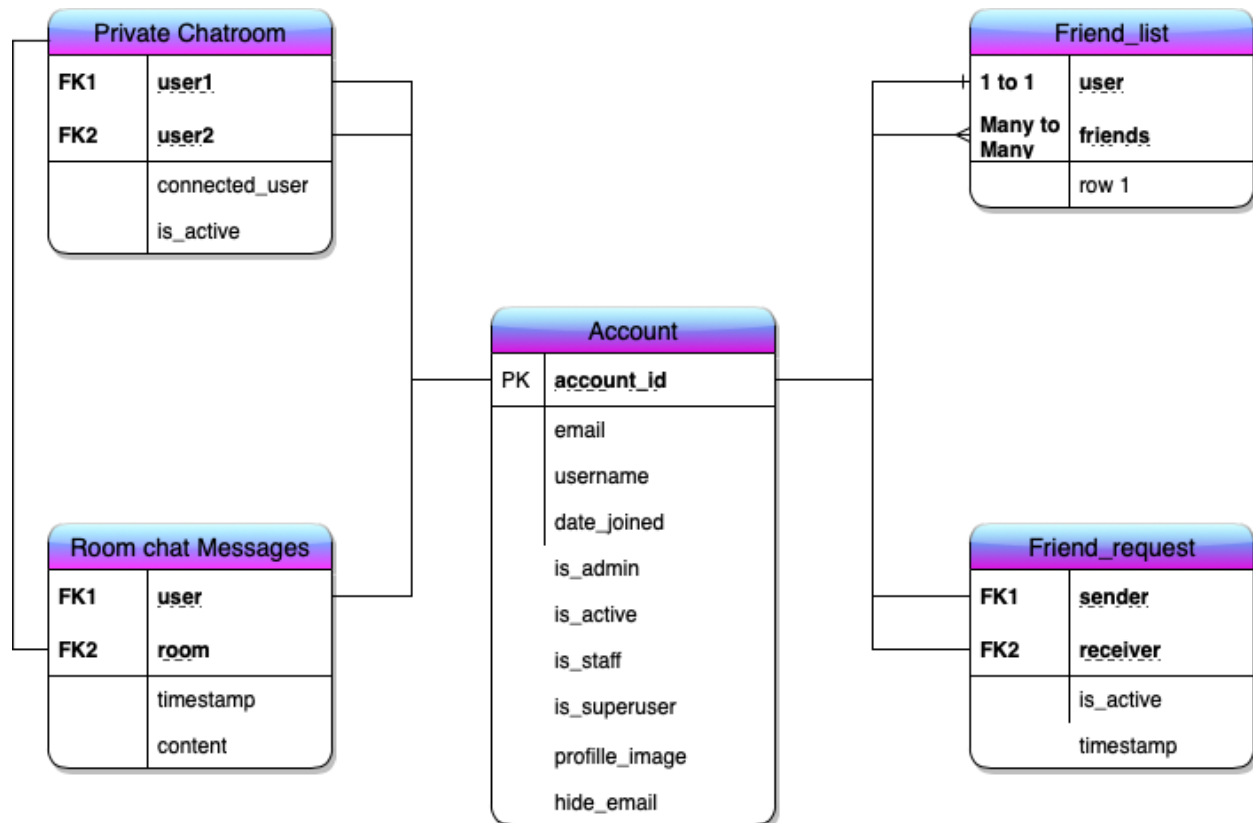
- 1 - As a developer, I want to develop a responsive real world front end for the application
- 2 - As a developer, I want to develop a responsive real world back end for the application
- 3 - 1 - As a developer, I want to develop a responsive real world database for the application
- 4 - As a developer I want to work close with my team to make sure everyone is on the same page
- 5 - As a developer I want to document the progress of the team
- 6- As a developer I want to find weaknesses in the infrastructure

Sprint 5

- 1 - As a developer, I want to develop a responsive real world front end for the application
- 2 - As a developer, I want to work on the project poster for the showcase
- 3 - 1 - As a developer, I want to work on the final deliverable file for the project
- 4 - As a developer I want to make the front and back end work together
- 5 - As a developer I want to document the progress of the team
- 6- As a developer I want to find weaknesses in the infrastructure

SYSTEM DESIGN

This section contains information on the design decisions that went into this project. The system design focuses on the back-end of the program to explain how the process of the chatroom occurs and works. A GUI Wireframe is included to show the Alpha version of the design prior to final changes.



Chatroom System Design

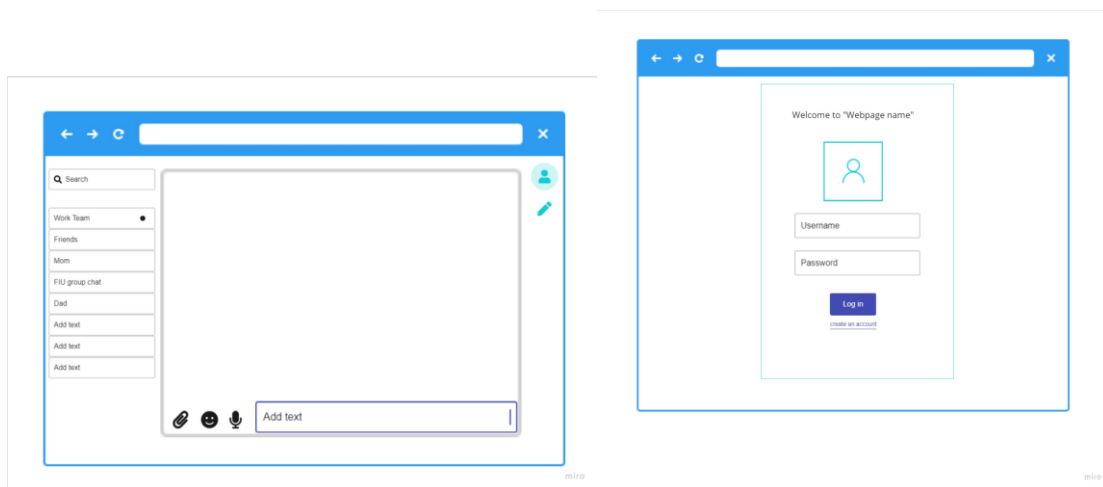
Currently the system is in early stages of development. The chatroom system design consists of a 1 to 1 messaging system that is created in django which can take the users input(content) and send it to the other user. It is also able to send friend requests to another user in order to allow both users to be able to message between each other. The Chatroom system will also store the “date_joined” time of making the account to ensure a beginning time is established to create the time of 24 hours the account is active for. The results of this showcase that the user is able to chat with another user as pgadmin4 and redis run in the background to allow the system to work.

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System and Subsystem Decomposition

The front-end for Guacamole ID was made with React and Visual Studio Code was used as the IDE. The main languages within the project so far are, HTML5, CSS, Javascript, React, and Python for the front-end, Django is used for the back-end. Redis is used to allow the chatroom to be able to properly run and allow for communication between the two users and the sending of friend requests. Pgadmin4 is used as the database to store the information when the chatroom is running. As the project is still in the early stages in development, in the future it would be good if the front-end and back-end could be properly combined.

GUI Wireframe



An Alpha version of the front-end design was created to give an idea of what the front-end would look like in its final version. Many changes were made over the course of the project, such as the color of it, though the concept of the wireframe stayed largely the same.

SYSTEM VALIDATION

Guacamole Chat is still a work in progress, all the technologies used took time to learn and there was not enough time to finish all the work. I firmly believe that if the project is continued in the following semesters it can be completed

GLOSSARY

- **React.js:** JavaScript framework used to work on front end development
- **CSS:** Language mainly used for styling the webpage.
- **Fiddler Everywhere:** Program used to process the input of a user to scan for any weak points and vulnerabilities in the URL or IP address.
- **HTML:** Markup language used for tagging text files and creating hyperlink effects.
- **PostgreSQL:** A database program that is used to store users and their contacts and messages
- **Product Owner:** The head of the project, Nima Schei.
- **Python:** High level programming language
- **Visual Studio Code:** A source code editor.

APPENDIX

Appendix A - User Interface Design

The login and register page

The image displays two mobile application screens for user authentication, set against a vertical gradient background transitioning from magenta to blue. The top screen is the 'Login' page, featuring a white card with the title 'Login'. It contains two input fields: 'Username*' and 'Password*', the latter with a toggle icon. A blue 'SIGN IN' button is positioned below the fields, followed by the text 'New around here?' and a link to 'REGISTER'. The bottom screen is the 'Register' page, also with a white card and the title 'Register'. It includes four input fields: 'Username*', 'Email*', 'Password*', and 'Confirm Password*', each with a toggle icon. A blue 'REGISTER' button is located below the fields, followed by the text 'Already have an account?' and a link to 'LOGIN'.

Login

Username*

Password* 

SIGN IN

New around here?
[REGISTER](#)

Register

Username*

Email*

Password* 

Confirm Password* 

REGISTER

Already have an account?
[LOGIN](#)

The Chat Room

The screenshot shows a web-based email interface. On the left is a sidebar with a list of emails, each represented by a circular icon with a letter and the sender's name and email address. The main content area displays the details of the selected email. The email is from Eduardo (edu@company.com) with the subject 'Eduardo'. The body text reads 'Hello! I am writing to you'. Below the text is a signature block for Eduardo, including his name and email address.

Appendix B - Sprint Review Reports

Sprint 1 Review Meeting Minutes: 30

Project Name: A Novel Edge-based Computer Vision Application for Workforce Performance Optimization

Attendees: Ivan Ramirez Comas, Alec Joseph, Alexa Gonzalez, Chabelie Barranco, Jose Jimenez, Thamare Saint Louis, Harshit Singh, Amir Zarei, Carlos Matheus

Date: 05/29/2022

Start time: 5:00 PM

End time: 5:30 PM

After a show and tell presentation, the implementation of the following user stories were accepted by the product owners:

- 1 - As a developer, I want to be able to familiarize myself with the background information of this project
- 2 - As a developer, I want to be able to understand the project proposal and the wishlist. The input and output requirements.
- 3 - As a developer, I want to understand the methodology development of this project.
- 4 - As a developer, I want to analyze the correct audience for this project.
- 5 - As a developer, I want to know how to set up the required tools for this project.

The following ones were rejected and moved back to the product backlog to be assigned to a future sprint at a future Sprint Planning meeting for next semester:

- None at this time, because it is a startup of the product and concepts are basic.

Sprint 2 Review Meeting Minutes: 30

Project Name: A Novel Edge-based Computer Vision Application for Workforce Performance Optimization

Attendees: Ivan Ramirez Comas, Alec Joseph, Alexa Gonzalez, Chabelie Barranco, Jose Jimenez, Thamare Saint Louis, Harshit Singh, Amir Zarei, Carlos Matheus

Date: 06/12/2022

Start time: 5:00 PM

End time: 5:30 PM

After a show and tell presentation, the implementation of the following user stories were accepted by the product owners:

- 2 - As a developer, I want to be able to know what is the output with the minimum input from the requirements of this project.
- 3 - As a developer, I want to be able to develop a prototype of the project dashboard.
- 4 - As a developer, I want to be able to start developing the exemplar models.
- 5 - As a developer, I want to be able to find the drawbacks in making the model.
- 6 - As a developer, I want to be able to analyze case studies with a list of all kinds of vulnerabilities in a system.

The following ones were rejected and moved back to the product backlog to be assigned to a future sprint at a future Sprint Planning meeting for next semester:

- 1 - As a developer, I want to be able to use a suitable coding language platform that is convenient in all ways.

Sprint 2 Review Meeting Minutes: 30

Project Name: A Novel Edge-based Computer Vision Application for Workforce Performance Optimization

Attendees: Ivan Ramirez Comas, Alec Joseph, Alexa Gonzalez, Chabelie Barranco, Jose Jimenez, Thamare Saint Louis, Harshit Singh, Amir Zarei, Carlos Matheus

Date: 06/26/2022

Start time: 5:00 PM

End time: 5:30 PM

After a show and tell presentation, the implementation of the following user stories were accepted by the product owners:

- 1 - As a developer, I want to be able to think like a Hacker to identify every entry point in the organization.
- 2 - As a developer, I want to be more familiarized with the frameworks to be used
- 3 - As a developer, I want to study examples of similar projects
- 4 - As a developer I want to work close with my team to make sure everyone is on the same page

The following ones were rejected and moved back to the product backlog to be assigned to a future sprint at a future Sprint Planning meeting for next semester:

None at this time

-

Sprint 4 Review Meeting Minutes: 30

Project Name: A Novel Edge-based Computer Vision Application for Workforce Performance Optimization

Attendees: Ivan Ramirez Comas, Alec Joseph, Alexa Gonzalez, Chabelie Barranco, Jose Jimenez, Thamare Saint Louis, Harshit Singh, Amir Zarei, Carlos Matheus

Date: 7/10/2022

Start time: 5:00 PM

End time: 5:30 PM

After a show and tell presentation, the implementation of the following user stories were accepted by the product owners:

- 1 - As a developer, I want to be able to know the minimum requirements needed for the project to be efficiently run.
- 2 - As a developer, I want to be able to start with understanding the concepts needed to create the initial prototype.
- 3 - As a developer, I want to study examples of similar projects
- 4 - As a developer I want to work in tandem with my teammates so we are able to properly connect our two sides of the project together.
- 5 - As a developer I want to finalize the prototype that we are working on.

The following ones were rejected and moved back to the product backlog to be assigned to a future sprint at a future Sprint Planning meeting for next semester:

None at this time

-

Sprint 5 Review Meeting Minutes: 30

Project Name: A Novel Edge-based Computer Vision Application for Workforce Performance Optimization

Attendees: Ivan Ramirez Comas, Alec Joseph, Alexa Gonzalez, Chabelie Barranco, Jose Jimenez, Thamare Saint Louis, Harshit Singh, Amir Zarei, Carlos Matheus

Date: 7/24/2022

Start time: 5:00 PM

End time: 5:30 PM

After a show and tell presentation, the implementation of the following user stories were accepted by the product owners:

- 1 - As a developer, I want to be able to divide and conquer our project work and complete it with perfection.
- 2 - As a developer, I want to be able to attend the showcase and present my project work.
- 3 - As a developer, I want to be able to create and present posters that contain the summary of the project.
- 4 - As a developer, I want to be able to create videos on the guidance of the project server.
- 5 - As a developer, I want to be able to turn in complete documentation for the final deliverables.

The following ones were rejected and moved back to the product backlog to be assigned to a future sprint at a future Sprint Planning meeting for next semester:

None at this time

Appendix C - Installation/Maintenance Document

Installations/Maintenance Guide

Python:

Download latest version at <https://www.python.org/downloads/>

Node.js:

Download the latest version at: <https://nodejs.org/en/>

PostgreSQL:

Download the latest version at: <https://www.pgadmin.org/download/>