CSCI 4600

Vison Document

Pathfinder Visualizer

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Contents

1 Introduction

1.1 Document Purpose

This document outlines the vision for the Pathfinder Visualizer. The purpose of this document is to:

- Show how visualizing different kinds of pathfinding algorithms is beneficial to customers
- Show that educating people on how different pathfinding algorithms work is beneficial to customers
- Propose a solution
- Identify any constraints to the solution
- Identify the software development team
- Identify the stakeholders

1.2 Scope

The scope of this document is associated with the Pathfinder Visualizer which will effectively educate people of all ages by visualizing how different pathfinding algorithms work through an easy to understand user interface.

2 Positioning

2.1 Business Opportunity

A lot people want to get into software design and software engineering however the task seems daunting to people that are just starting out. A lot of concepts like pathfinding algorithms are hard to understand and visualize. Some programs attempt to alleviate this problem but fail by being too clunky to use or by not having enough features. We aim to create a simple, easy to use pathfinding visualizer that will not only help people understand how these algorithms work but also introduce new people into the world of software engineering.

2.2 Problem Statement

THE PROBLEM OF	**PEOPLE NOT BEING ABLE TO UNDERSTAND HOW PATHFINDING ALGORITHMS WORK**
AFFECTS	People of all ages who do not understand how pathfinding algorithms work
THE IMPACT OF WHICH IS	People getting discouraged to try and learn about these algorithms because they lack the necessary understanding
A SUCCESSFUL SOLUTION WOULD BE	A simple, easy to use application that effectively visualizes how different algorithms work
FOR	People of all ages who do not understand how pathfinding algorithms work
WHO	Lack the proper understanding of pathfinding algorithms
THE PATHFINDER VISUALIZER	Is a software application
THAT	Provides the ability to see how different pathfinding algorithms work in different environments
UNLIKE	Other products that are clunky and have limited features
OUR PRODUCT	Provides people with a software application that is easy to use and properly visualizes different pathfinding algorithms

3 Stakeholder and User Descriptions

3.1 Market Demographics

As we are not a well-known company currently we do not have a built-up reputation like some other competitors. However, by publishing the Pathfinding Visualizer we hope to be the main source of focus in this area and build a good reputation with the people who use our product.

The target market is people of all ages who wish to be educated or do not understand how pathfinding algorithms work.

3.2 Stakeholder Summary

NAME	DESCRIPTION	RESPONSIBILITIES
REQUIREMENTS ENGINEERS	This stakeholder works with customers and stakeholders to translate needs into requirements.	Specifies and refines different types of requirements as needed.
SOFTWARE ARCHITECT	This stakeholder is a primary lead in the development of the Pathfinder Visualizer.	Responsible for the overall architecture of the system and guides overall design and implementation of the system.
PROJECT MANAGER	This stakeholder leads development of the Pathfinder Visualizer.	Plans, manages, and allocates resources, decides priorities, coordinates interactions with customers and users, and keeps the project team focused.

3.3 User Summary

NAME	DESCRIPTION	RESPONSIBILITIES	STAKEHOLDER
YOUNG PEOPLE (AGES 12-25)	Primary End user of the system	Uses application to further educate themselves on pathfinding algorithms	Self
MIDDLE AGE PEOPLE (AGES 26-55)	Primary End user of the system	Uses application to further educate themselves on pathfinding algorithms	Self

4. Product Overview

4.1 Product Perspective

The Pathfinder Visualizer is a self-contained, independent system.

4.2 Summary of Capabilities

CUSTOMER BENEFIT	SUPPORTING FEATURES
ENHANCED UNDERSTANDING AND INTEREST IN SOFTWARE ENGINEERING	User-defined maze on a 2D grid
ENHANCED UNDERSTANDING OF PATHFINDING ALGORITHMS	Visual representation and simulation of pathfinding algorithms

4.3 Assumptions and Dependencies

- The use of a GUI assumes the user to be able to read and to use a mouse input.
- It is assumed that the user can read in English.
- The Pathfinder Visualizer runs on the Windows operating system.

5. Product Features

- A GUI tutorial to teach the user on how to utilize the application
- User-defined wall nodes on a 2D grid (pathfinder algorithm cannot penetrate)
- User can define weighted nodes (applies only to weighted pathfinding algorithms)
- Multiple algorithms for the user to choose from (including but not limited to Dijkstra, Breadth-first, and Depth-first)
- A description for each pathfinding algorithm
- Default maze patterns built into the application
- Random maze pattern generation
- Colors to differentiate visited nodes, unvisited nodes, and shortest-path nodes
- User can toggle visualization speed
- User can set/change start and end nodes

6 Constraints

- Since the software is not web-based slow internet could be a problem during installation
- Visually impaired people may not be able to use this software
- Only being developed for the Windows Operating System

7 Other Product Requirements

While our program has no real hardware requirement, we do recommend that the user of our software has a processor with speeds of at least 2.0 GHz and some sort of graphics processor. We also recommend that the user have a stable internet connection to download the software.