

SOFTWARE REQUIREMENT SPECIFICATION

High Performance Deep Learning for disaster detection

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Contents

1	Introduction	2
1.1	Purpose	2
1.2	Product overview	2
2	Specific Requirements	3
2.1	Product Perspective	3
2.2	Definitions, Acronyms, Abbreviations	3
2.3	External Interface Requirements	3
2.3.1	Hardware Interfaces	4
2.3.2	Software Interfaces	4
2.3.3	Functional Requirements	4
2.3.4	Software system attributes	5
2.4	Database Requirements	5

Chapter 1

Introduction

This chapter discusses about the description of the software system to be developed. It lays out functional and non-functional requirements, and also a set of use cases that describe the user interaction that the software must provide.

1.1 Purpose

The purpose of the document is to collect and analyze all assorted ideas that have come up that define the system and the requirements that the customer needs. Also, we shall predict and sort out how we hope this product will be used in order to gain a better understanding of the project and outline concepts that may be developed later and document ideas that are considered but may be discarded as the project builds or develops. In short, the purpose of the SRS document is to provide detailed description of the requirements of the software product, its parameters and goals, its audience and at the last its functionality.

1.2 Product overview

A natural disaster is a devastating event caused by rain, wind, fire, and even earth that endangers people's lives and property. Although there is often little that can be done to prevent a natural disaster, people can take steps to reduce the effect that it has on themselves and their property. Disaster Detection is the first and most important step in this Disaster recovery plan. Speed and Accuracy is the main feature of a disaster detection system as it is the requirement that for faster recovery plan to get into action. The purpose of this project is to detect the disaster as fast as possible with high accuracy and it will be used for detection of the disaster with the help of remote sensing images.

Chapter 2

Specific Requirements

This section contains all of the functional and quality requirements of the disaster detection system. It gives a detailed description of the system and all its features.

2.1 Product Perspective

The software we will be using for performing the project is python programming language IDE. The dataset is a disaster images database filled with pre-disaster and post-disaster images. The software will take a remote sensing images as input and decide if a disaster is happened or not. If yes, then which part of the image the disaster has happened.

2.2 Definitions, Acronyms, Abbreviations

Table below shows the abbreviations, definitions and acronym of various terms used in this document.

SRS	Software Specific Requirements
CPU	Central processing Unit
GPU	Graphics processing unit
Windows	Windows is a series of graphical interface operating systems developed and sold by Microsoft.
Python	Python is a widely used programming language. Also, Python features a dynamic type system and automatic memory management. It supports multiple programming paradigms including object oriented , imperative , functional and procedural and has a large library to back it up.
IDE	Integrated Development Environment.

2.3 External Interface Requirements

User Interfaces

1. The user interface simply consists of a upload button to upload the files.To detect damage of a particular region the satellite image of the region needs to be uploaded on the website.
2. Then there will also be a detect button that starts the processing at the backend to detect the damaged area.
3. There will be an accuracy button that will give the accuracy of the model.

2.3.1 Hardware Interfaces

Hardware	Minimum Requirements
Central Processing Unit (CPU)	Intel Core i5 6th Generation processor or higher.An AMD equivalent processor will also be optimal.
RAM	8 GB minimum, 16 GB or higher is recommended.
Graphics Processing Unit (GPU)	NVIDIA GeForce GTX 960 or higher. AMD GPUs are not able to perform deep learning regardless.

2.3.2 Software Interfaces

1-an operating system

a)windows-10 and above

b)Oracle Linux 6 64-bit or later

2-software (IDE)-

Anaconda distribution is used for python.

Anaconda is a free and open source distribution of the Python and R programming languages for data science and machine learning related applications (large-scale data processing, predictive analytics, scientific computing), that aims to simplify package management and deployment.

3- Library-

Tensorflow: Install deep learning library for mathematical computations.

4-web browser a)Microsoft Internet Explorer 7.0 and above

b)Mozilla Firefox 3.5 and above

c)Apple Safari 5.0 and above

d)Google Chrome 1.0 and above

2.3.3 Functional Requirements

1. Upload the files , where we will upload the files that need to be processed.-(Validity checks on the inputs)
2. Detect i.e the detection of the damaged area of the uploaded file based on the learned training model.

3. Accuracy.This gives the accuracy of the detected images and the training model.

2.3.4 Software system attributes

Reliability

The application software will meet the requirements without any error.The output should display correct information about detected areas of disaster because deep learning is used here. It gives great accuracy.

Availability

The application is available whenever the user wants to use it and the GPU and operating system and python IDE are working properly.

Security

The images used are certified images.And also it doesn't give data to anyone.It just builds a training model with higher accuracy.

Maintainability

The application should be written very nicely ,code intended and documented.Also, The operating systems , CPU and CPU should be checked properly time to time to maintain the application.

Portability

The application will be made in python language.Python is operating system free,thus no restrictions on it.Thus, the code can be run on any GPU platform since the objective of the project is to find the detected disaster area in real time.Thus, it can be run on any GPU platform under any python environment.

Performance

Since it is a GPU based system, it will be very fast.Afterall this is the objective of the project.Also,since deep learning is used here,the answer should accurate.

2.4 Database Requirements

Here, for training the model for this specific purpose, 1GB database of remote sensing images is used.This database is the repository data for learning purposes.