AJE Fire Detection System

Version 1.0

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AJE

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Revisions Page

Date	Version	Changes
10/3/2018	1.0	Creation of document
11/30/2018	1.1	Purpose, Assumptions and Constraints

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1 Introduction

1.1 Project Overview:

1.1.1 Purpose:

Forest fires are a major concern in the present day global ecosystem, causing harm in ways such as destroying timber, killing wildlife, and polluting the air. Our goal in developing a Forest Fire Detection System is to not prevent forest fires from occurring, but to detect when they first start and notify authorities in order to minimize the damage.

1.1.2 Scope:

Given that so little is known about what the EarthNow API will look like, we decided to focus on building just a fire detection module that would eventually become a part of our complete system. The finished detection module would take satellite images as inputs, and output 'true' or 'false' for whether or not the provided image contains a fire. The detection module would use an artificial neural network to analyze images, and so the ANN would need to be developed and refined by taking training data as input. Training data would consist of images that have fires and images that don't, plus the true classification for each image, that is, whether or not a given image actually has a fire.

1.1.3 Assumptions and Constraints:

Assumptions:

- There is access to reliable pictures of forests
- There will be access at some point to the EarthNow API
- The internet will be accessible to find our data
- There will be no hardware limitations

Constraints:

- The EarthNow API is not yet available
- The amount of satellite training images available
- The frequency of updated satellite video frames

1.2 Literature Review

While pattern recognition using artificial neural networks has been a common industry practice for many years, there isn't readily available software that uses ANNs to solve the problem of wildfire detection. This may be due to the fact that live satellite video footage has never been available to the public, so there hasn't been a use for fire-detection software until now.

2.   Project Organization

      2.1   Roles and Responsibilities

Team Member	Role	E-Mail
Anis Beyzaee	Configuration manager, quality manager, developer	anisbeyzaee@bellevuecollege.edu
Joey Colombi	Team Leader, Scriber, developer	joey.colombi@bellevuecollege.edu
Ephraim Scarf	Communications manager, meeting facilitator, developer	ephraim.scarf@bellevuecollege.edu

      2.2   Tools and Techniques

- Agile Development
- Modular Design
- Object-Oriented Design
- UML
- Unit Testing
- IDE
- Artificial Neural Network

3.   Project Management Plan

      3.1   Tasks

- Meetings with mentor
- System requirements

- Use Cases
- Use Case Diagrams
- Class Diagrams
- Sequence Diagrams
- Scrum Meetings
- Coding Development
- Redesign (in case of change in requirement)
- Testing

3.2   Assignments

- Study Artificial Neural Networks
- Talk to the client to find the system requirements and use cases
- Website design and maintenance

3.3   Timetable

Week Number	Plan
Week 3	Finish product management plan document and begin requirements document
Week 4	Finish requirements document, start development of website, research on ANN's
Week 5	Begin design document, continue research on ANN's, learn about image recognition
Week 6	Finish design document, start developing code (basic image recognition/ANN)
Week 7-8	Continue research on ANN's and image recognition and developing code
Week 9-10	Continue developing code and preparing for presentation
Week 11	FInish preparation for presentation, submission of code, and final drafts of documents

4　　　Additional Material

- Definitions, Acronyms and Abbreviations
  - API: Application Programming Interface
  - ANN: Artificial Neural Network
  - AJE: The name of our system
  - Mentor: Instructor guiding us with the project

- References
  - Coldewey, Devin (18 April 2018). "EarthNow promises real-time views of the whole planet from a new satellite constellation". TechCrunch.