

Cretaceous Gardens Controller

Software Requirements Specification

SRS Version 1.0

Team #3

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CS 460 Software Engineering

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1 Introduction

The purpose of this document is to *specify* the requirements for the development of the Cretaceous Gardens Controller (CGC). The specification is formalized and diagrammed in order to guide the eventual implementation of the system. Information encountered in the corresponding *Requirements Definition Document* is reiterated and restated here where relevant.

After this introduction¹, Section 2 gives an overview of the system. Section 3 delves into more detail with subsections 3.2 and 3.1 that feature a more granular view of the *Control Logic* and the *External Interfaces*. Section 5 provides the definition of technical terms that will be commonly used.

¹Introduction by Ezequiel Ramos

2 General Description

This section ² provides a general overview of the whole system. How the system interacts with the hardware interfaces and its basic functionality are introduced here. A description of parts to be used in the system and the available functionalities for each type are also provided. Some high level constraints and assumptions for the system will be also be presented. It should be noted that a more detailed specification of constraints is covered in its own section.

2.1 Product Perspective

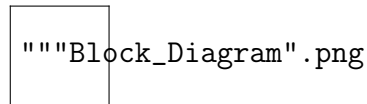


Figure 1: Block Diagram

2.2 Product Functions

²General Description by Ezequiel Ramos and Santiago Cejas

2.3 User Features

2.4 High Level Constraints

2.5 Assumptions

We assume that the infrastructure is all redundant. The CGC is installed on redundant servers. the network backbone has physical redundant links to appropriate devices like the cameras, the PA speakers, and the electric fence. We will also program redundancy into the logic. Like the ability to have another car available in case of an emergency or if the car breaks down.

Another assumption is that messages would be encrypted in order to provide the security needed, so the messages can not be intercepted and modified.

3 Specific Requirements

3.1 Interfaces

The Interfaces³ make up all the pieces that the CGC communicates with. The CGC itself must communicate with everything, but a lot of interfaces can function on their own. The car interface is an example of one that needs to be able to function on it's own.

³External Interfaces by Anas Gauba

Pay Kiosk

Incoming Events

1. Register visitor(demographics)/request money.
2. Accept money(type)/build token.

Outgoing Events

1. Activate token(id).
2. Dispense token(id).
3. Dispense change(money, receipt).
4. Log transaction.
5. Report health status to CGC.

Token

Incoming Events

1. Trigger Alarm.
2. Return to car(carID).

Outgoing Events

1. Report location to GPS Server(gpsID).

Car

Incoming Events

1. Read token(tokenID)/Unlock doors or deny access.
2. Activate car()[Normal Mode]/Go to south end to pick up visitors.
3. Activate car()[Emergency Mode]/Go to north end to pick up visitors.
4. Arrived(Destination)[Normal Mode]/pick up or drop off visitors following the conditioned the protocol.
5. Arrived(Destination)[Emergency Mode]/pick up or drop off visitors following the conditioned the protocol.
6. Weight detected.
7. Change driving mode(modeName).
8. Activate intercom.

Outgoing Events

1. The GPS current location(id).
2. Alert visitors(carID).
3. Trigger alarm.
4. Report health status to CGC.

T-Rex Monitor

Incoming Events

1. Inject tranquilizer.

Outgoing Events

1. Report T-Rex health.
2. Report health status to CGC.
3. Report location to GPS Server(gpsID).

Camera Network

Incoming Events

1. Delete recording(cameraID, date range).
2. Activate recording(cameraID).
3. Monitor streaming(cameraID).

Outgoing Events

1. Camera outage(cameraID).
2. Report health status to CGC.

Electric Fence

Incoming Events

1. There is no incoming event for this interface.

Outgoing Events

1. Electricity distortion/trigger an emergency mode.
2. Report health status to CGC.

Global Alarm System

Incoming Events

1. Trigger alarms[Emergency Mode]/play emergency alarm sound.
2. Trigger alarms[Normal Mode]/play Public Service Annoucement (PSA).
3. Disable alarms.

Outgoing Events

1. Report health status to CGC.

CGC Station

Incoming Events

1. Review health status of all the associated devices.

Outgoing Events

1. Activate tranquilizer.
2. Deactivate emergency mode.
3. Activate intercom.

GPS Server

Incoming Events

1. Track location(gpsID).

Outgoing Events

1. Report location(gpsID).

3.2 Control Logic

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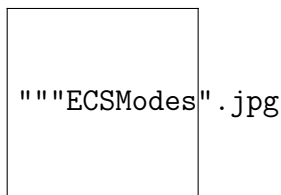


Figure 2: Elevator Control System Normal Function Model

⁴Control Logic by Siri Khalsa

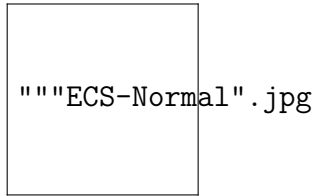


Figure 3: Elevator Control System Normal Function Model

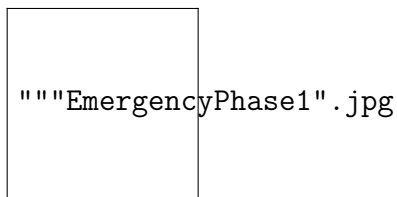


Figure 4: Elevator Control System Normal Function Model

4 Design Constraints

The constraints⁵ on the ECS's software will be fewer than the system as a whole but there will still be constraints present.

4.1 Client

-

4.2 Safety

-

4.3 Regulations

-

4.4 Security

-

⁵Design Constraints by Matthew Stone

5 Definition of Terms

The following is a list of definitions ⁶ of the most commonly used technical terms within this document, whose meaning may not be immediately apparent to the lay reader. Most definitions come from no specific source; instead they are defined by the authors in the context of their use in this document and originate from the vocabulary shared across the general references cited . In the event that a definition was taken directly from a source, it is followed by a citation

CGC: Acronym for Cretaceous Gardens Controller

DVR: Acronym for Digital Video Recorder

Electrical Conduction: The movement of electrically charged particles through a transmission medium.

GPS: Acronym for Global Positioning System

Hardwired Ethernet: This references the latest IEEE standard for Ethernet utilizing physical cables.

Network: All nodes with which the CGC interacts, the links that connect them to each other and to the CGC, the CGC itself, and all related databases.

Node: The generic term that refers to any device connected to the CGC in any way. This includes autonomous vehicles, tokens, the T.Rex monitor, all electric fence panels, all kiosks, and all cameras.

Safely Inactive: A state in which a vehicle is fully functional and ready to be dispatched.

Safely Occupied: A state in which a vehicle contains at least one person, is locked, and is ready to depart.

Token: An interactive device used by the visitor that grants access to locations.

⁶Definition of Terms by Anas Gauba