**System Requirements Specifications**

**Volt & Pepper Southeast Con Autonomous Robot**

**Abstract:**

**Revision History**

|  |  |  |
| --- | --- | --- |
| **Date** | **Reason for Change** | **Version** |
| Sep. 5, 2014 | Initial draft of document | 0.0.1 |
| Sep. 7, 2014 | Added requirements and user stories | 0.0.2 |
| Sep. 8, 2014 | Revised requirements, added definitions | 0.0.3 |
| Sep. 9, 2014 | Updated Definitions | 0.0.4 |
| Sep. 11, 2014 | Defined sections of document | 0.0.5 |
| Sep. 12, 2014 | Compiled components of SRS together | 0.0.6 |
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|  |  |  |

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**Introduction**

(ADD VPS) volt and pepper system.

(ADD SEC) south east con

**Purpose**

**Mission Statement**

**Scope**

**Team Info**

|  |  |
| --- | --- |
| **Name** | **Role** |
|  | Team Leader |
|  | Development Leader |
|  | Testing Leader |
|  | Software Configuration Manager |
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| Nezar Bahksh | Scrum Master |
| Brittany Rompa | Product Manager |
| Nezar Bahksh | Developer |
| Greg Carkin | Developer |
| Gary Roach | Developer |
| Brittany Rompa | Developer |

**Overall Description**

**Stakeholders**

**Team**

**Instructors**

**ERAU**

**Nova Southeastern University & Broward College**

**ABET**

**Product Perspective**

The VPS is intended to be a self-propelled, autonomous robot that can complete a series of challenges for the SouthEast Con competition.

**Product Functions**

The functionality of the VPS is divided into seven major states: (1) The robot startup state, referred to as the setup throughout this document, (2) The robot navigation state, referred to as navigation throughout this document, (3) The robot Simon challenge state, referred to as Simon throughout this document, (4) The robot Etch A Sketch challenge state, referred to as Etch A Sketch throughout this document, (5) The robot Rubik’s cube challenge state, referred to as Rubikl’s cube throughout this document, (6) The robot playing card challenge state, referred to as playing card throughout this document, (7) The robot shut down state, referred to as shut down throughout this document, These states do not impose a design constraint on the VPS, but are instead used to facilitate the requirements engineering process.

**Constraints**

**Assumptions and Dependencies**

The rules will potentially change.

Major system dependencies for the VPS include:

* SEC Regulations-

**Use Cases**

**Startup**

**Navigation**

**Simon**

**Etch A Sketch**

**Rubik’s Cube**

**Playing Card**

**Sequence Diagrams**

The following diagrams provide a sequence of actions in order to complete a task. The tasks are broken into 6 components based on the potential states of the robot. Initially there is the startup state which occurs when the robot receives the start signal, which has yet to be determined by the competition. The following state is an ongoing state having to do with navigation around the course. Thus it is named the navigation state. The last four states have to do with each of the games; a Simon state, Etch A Sketch state, Rubik’s cube state, and a playing card state. All of the states require preconditions and post conditions in order to enter and exit the state. The specific conditions have yet to be determined, but in general the main task of each state must be completed before the robot transitions to the following state. IE before the robot can exit the Simon state; it must have completed the task first.

The following figure provides the sequence of general activities for the startup state of the robot.



The following figure provides the sequence of general activities for the navigation state of the robot.



The following figure provides the sequence of general activities for the Etch A Sketch state of the robot.



The following figure provides the sequence of general activities for the playing card state of the robot.



The following figure provides the sequence of general activities for the Rubik’s cube state of the robot.



The following figure provides the sequence of general activities for the Simon state of the robot.



**Requirements**

(ADD IN) Fisher Prices Simon Carabiner game hence forth referred to as Simon.

**Functional**

* The robot shall traverse the course.
* The robot shall remain on the white line, which marks the path of the course, at all times.
* The robot shall complete all four challenges, defined as: Simon game, Etch A Sketch, Rubik’s Cube and playing cards.
* The robot shall complete each challenge once.
* The robot shall keep track of progress on a challenge
* The robot shall move to the next challenge once the current challenge is complete.
* The robot shall complete the challenges in a sequential matter.
* The robot shall execute the challenges one at a time.
* The robot shall activate the Simon game.
* The robot shall obtain a pattern from Simon.
* The robot shall press the buttons on Simon in a pattern corresponding to the obtained pattern.
* The robot shall print “IEEE” on an Etch A Sketch.
* The robot shall rotate one row of a Rubik’s Cube 180 degrees.
* The robot shall obtain one playing card from a deck of cards.
* The robot shall complete the course with the playing card.
* The robot shall move to the finish line once all challenges are complete.
* The robot shall cross the finish line.

**Non-Functional**

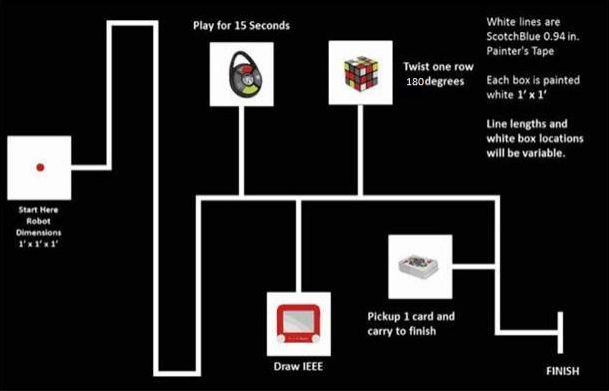
* The robot shall fit within 1 ft3.
* The robot shall be autonomous.
* The robot shall remain on the course for 5 minutes.
* The robot shall interact with Simon for exactly 15 seconds.
* The robot shall complete the challenges in sequence.
* The robot shall execute all requirements within 5 minutes.
* The robot shall press the buttons on Simon before Simon outputs an error tone.
* The robot shall not damage the course.
* The robot shall not contain flammable liquids, gels and gasses.
* The robot shall do no harm.
* The robot shall operate with an on-board power supply
* The robot shall

**Glossary**

*Robot*: The platform being built for the 2015 IEEE SoutheastCon

*Autonomous*: ------

*Course*: 5/8 inches x 4 feet x 8 feet Sanded Pine Plywood



**Figure 1: 2015 IEEE SoutheastCon Hardware Competition course (IEEE)**

*Line*: Scotch Blue 0.94 inches x 60 yards. Painter's Tape, Model# 2090-1J Store SKU # 958999

*Recognize*: To identify from knowledge of appearance or characteristics. (recognize)

*Challenge:* One of the four tasks—Simon, Etch A Sketch, Rubik’s Cube, or playing card.

*Traverse*: To move along.

*Interact*: Turn on Simon, obtain and deliver output to Simon

*Pattern*: The sensory output sequence from Simon.

*Complete*: Finish interacting.

*Know*: To perceive or understand.

*Obtain*: Have possession of.

*Sequence*: Simon, Etch A Sketch, Rubik’s Cube, playing card, finish line

*Print*: To draw or produce.

*Turn on*: Power Simon “on” by pressing the middle button

*Output*: The pattern from Simon.

*Inpu*t: The pattern returned to Simon.

*Finish line*: Refer “FINISH” in Figure 1

*Simon*: - Simon Carabiner - “R”Web#:351215, SKU:226CE810, UPC/EAN/ISBN:014397018500

*Etch A Sketch*: Pocket Etch A Sketch - By: Ohio Art - “R”Web#:636061, SKU:FD79DD3F, UPC/EAN/ISBN:026511051508

*Rubik’s Cube*: - Rubik's 3x3 Cube - “R”Web#:374846, SKU:DAD09D9E, UPC/EAN/ISBN:714043050273

*Playing card*: A card from a standard 52-card deck – Toys”R”Us # (TBD)

*Deck of cards*: Standard 52-card deck – Toys”R”Us # (TBD)

Acronyms & Abbreviation

# References

IEEE. (n.d.). *SoutheastCon Hardware Competition Rules (DRAFT)*. Retrieved September 8, 2014, from http://sites.ieee.org/sb-unfc/files/2014/07/hardwareComp2015.pdf

*recognize*. (n.d.). Retrieved September 2014, from Dictionary.com: http://dictionary.reference.com/browse/recognize

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