Carnegie Mellon University

Robotics Capstone Project

Detailed Design

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1 Introduction

NJ: describes what detail design doc is for. also describes organization of doc - parts defined, then overall system operational modes and diagrams, then implementation, then fault-recovery

2 System Diagrams

NJ: Intro specifying that diagrams are for components/full system hardware all diagrams have short description

2.1 Full System Digrams

2.2 Component Diagrams

2.3 Wiring Diagrams

3 Operational Modes

NJ: "define system states and operational modes to support concept of operation". not sure about this, maybe have the full system diagram from previous doc? "define temporal aspects with statecharts or other models". not really sure what to include here either

4 Hardware Fabrication Process

NJ: "explain the fabrication and implementation process"

4.1 Assembly Instructions

NJ: required according to instructions, this can fit all hw subsystems together

4.2 Writing Implement

4.3 Locomotion

4.4 Localization

4.5 Image Processing

4.6 Work Scheduling, Distribution and Planning

4.7 Communication

4.8 User Interface

4.9 Power System

4.10 Full System

5 Parts List

5.1 Part Name

Part Use: Foo
Supplier: Your Mom
Part Number: 8675309
Price: $0
Quantity: 20

6 Software Implementation Process

6.1 Design Hierarchy

NJ: "object oriented" or "structured design"'. probably best to split this into software subsections

6.2 Software Libraries and Packages

NJ: list of software libraries (apriltags, python, c++, protobuf, etc.)

6.3 Writing Implement

6.4 Locomotion

6.5 Localization

6.6 Image Processing

6.7 Work Scheduling, Distribution and Planning

6.8 Communication

6.9 User Interface

6.10 Power System

6.11 Full System

7 Failure States and Recovery

NJ: probably best to organize failure states/recovery by subsystem section for describing fault recovery and "degraded modes" similar to failure modes from test plan

7.1 Writing Implement

7.2 Locomotion

7.3 Localization

7.4 Image Processing

7.5 Work Scheduling, Distribution and Planning

7.6 Communication

7.7 User Interface

7.8 Power System

7.9 Full System

8 Installation Plan

NJ: "includes size, weight, power, other resource needs"

9 Traceability Matrix

NJ: "detailed design should make clear how system meets functional and non-functional requirements, can be done by tracing requirements to design attributes". Maybe another table linking requirements to sub/subsub sections in the doc

References