ETSA02-SRS-BMB

SOFTWARE REQUIREMENTS SPECIFICATION

for

Basic Melee Bot

Version 0.3

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Contents

Revision History

Name	Date	Reason For Changes	Version
Markus Borg	2018-04-02	Initial draft.	0.1
Markus Borg	2018-04-03	Complete draft of four features.	0.2
Markus Borg	2018-04-16	Added two quality requirements.	0.3

1 Introduction

1.1 Purpose

To be written...

Basic Melee Bot describes a robot that can be a part of team matches in RoboCode.

<Identify the product whose software requirements are specified in this document, including the revision or release number. Describe the scope of the product that is covered by this SRS, particularly if this SRS describes only part of the system or a single subsystem.>

1.2 Document Conventions

To be written...

In the remainder of this document, we refer to Basic Melee Bot as "the robot".

This document is organized according to the ISO/IEC/IEEE template X...

This document uses the term "quality requirements" to specify operational requirements on system behavior. Other synonymous terms include "non-functional requirements" and "extra-functional requirements".

Section 4, System Features, constitutes the backbone of this document. The section is organized around high-level features that are briefly described and complemented with their respective stimuli, i.e., the event that triggers the execution of the feature. Each feature is further refined into detailed requirements of one or more of the following types: 1) use cases, 2) functional requirements or 3) quality requirements.

Use cases are used when the robot shall conduct a sequence of steps, and there are explicit exception cases that needs to be specified.

All quality requirements are explicitly categorized according to ISO/IEC 25010, specified with capital letters in brackets. Moreover, each detailed requirement has a unique identifier according to the below formats:

- UC-<Feature Number>-<Running number> for use cases
- FREQ-<Feature Number>-<Running Number> for functional requirements
- QREQ-<Feature Number>-<Running Number> for quality requirements

Using the identifiers, each detailed requirement can be traced both to the implementation in Java source code and the test specification

In the document, text in bold font is used to indicate the priority of a feature. Unless otherwise stated, the priority of a feature is inherited by the detailed requirements.

Terms expressed in italic font carry a particular meaning. All terms in italic font are defined in the Glossary in Appendix A.

<Describe any standards or typographical conventions that were followed when writing this SRS, such as fonts or highlighting that have special significance. For example, state whether priorities for higher-level requirements are assumed to be inherited by detailed requirements, or whether every requirement statement is to have its own priority.>

1.3 Intended Audience and Reading Suggestions

The document constitutes an example of a software requirements specification for RoboCode robots. The primary readership is ETSA02 teams from two perspectives: 1) developing their own robots to offer on the RobotMarket, and 2) designing a robot team for the LU Rumble. In particular:

- ETSA02 Requirements engineers (learn what a SRS could look like)
- ETSA02 Domain experts ()

Secondary stakeholders include:

- ETSA02 Test managers (studying what testable requirements can look like)
- ETSA02 Project Supervisors

Tertiary stakeholders include:

- ETSA02 Sales engineers
- ETSA02 Project managers
- ETSA02 Development leads
- The general population of Robocode users
- University teachers (to find inspiration for software engineering teaching)

<Describe the different types of reader that the document is intended for, such as developers, project managers, marketing staff, users, testers, and documentation writers. Describe what the rest of this SRS contains and how it is organized. Suggest a sequence for reading the document, beginning with the overview sections and proceeding through the sections that are most pertinent to each reader type.>

Table 1.1: Intended readers of ETSA02-SRS-BLB.

Stakeholder type	**Goal when reading document**	**Recommended sections**
ETSA02 Requirements engineers	Learn from an archetypical Robot SRS	All document
ETSA02 Domain experts	Considering robot purchase for own team	
ETSA02 Test managers	Learn from examples what testable requirements could look like	Section 4
ETSA02 Project supervisors	Support project grading by studying an archetypical Robot SRS	All document
ETSA02 Sales engineers	Adapt marketing strategy based on basic robots available on the market	
ETSA02 Project managers	Obtaining a general understanding of an available basicrobot	
ETSA02 Development leads	Preparing development activities based on an archetypical robot SRS	
Robocode users		
University teachers		

1.4 Project Scope

To be written...

<Provide a short description of the software being specified and its purpose, including relevant benefits, objectives, and goals. Relate the software to corporate goals or business strategies. If a separate vision and scope document is available, refer to it rather than duplicating its contents here.>

1.5 References

To be written...

ISO/IEC/IEEE Template
ISO/IEC 25010
RoboWiki
ETSA02 RoboTalk Protocol

<List any other documents or Web addresses to which this SRS refers. These may include user interface style guides, contracts, standards, system requirements specifications, use case documents, or a vision and scope document. Provide enough information so that the reader could access a copy of each reference, including title, author, version number, date, and source or location.>

2 Overall Description

This section presents a high-level description of the robot.

2.1 Product Perspective

To be written...

Basic Melee Bot constitutes a normal robot that can be purchased to compete in robot teams in the LU Rumble. The robot is stronger than several of the example robots.

2.2 Product Functions

To be written...

<Summarize the major functions the product must perform or must let the user perform. Details will be provided in Section 3, so only a high level summary (such as a bullet list) is needed here. Organize the functions to make them understandable to any reader of the SRS. A picture of the major groups of related requirements and how they relate, such as a top level data flow diagram or object class diagram, is often effective.>

3 External Interface Requirements

This section describes all communication between the robot and its environment.

3.1 Robocode Interface

To be written...
<Describe the characteristics of the interface between the robot and the hardware components of the system. List all events that your Robot intercepts from Robocode, e.g., onScannedRobot() and on RobotDeath(), and describe the purpose of each. Refer to the Robocode application programming interface.>

3.2 Communications Interfaces

Basic Leader Bot adheres to the ETSA02 RoboTalk protocol [REF] for message broadcasting. The communication is restricted to setting a robot color as requested by a leader robot.

TBD

4 System Features

The Basic Melee Bot has four primary features: 1) Spinning radar, 2) Closest enemy targeting, 3) Non-stop anti-gravity movement, and 4) Wall avoidance.

4.1 Feature 1 – Spinning radar

BMB shall feature a spinning radar.

4.1.1 Description and Priority

The spinning radar is a simple solution to detect enemy robots by continuously scanning the entire battlefield.

Business priority: **high**
Implementation risk: **very low**

4.1.2 Functional Requirements

REQ-F1-1 The radar shall scan the battlefield clockwise as long as BMB is operational and the battle is ongoing.

REQ-F1-2 Detected enemy robots shall be stored in an internal data structure.

4.2 Feature 2 – Closest enemy targeting

BMB shall target and shoot at the closest enemy robot.

4.2.1 Description and Priority

The rationale behind targeting and shooting at the closest enemy is that nearby robots are easier to hit. The solution is simple but useful.

Business priority: **high**
Implementation risk: **low**

4.2.2 Functional Requirements

REQ-F2-1 BMB shall fire at the closest enemy robot as long as the battle is ongoing.

REQ-F2-2 BMB shall use a constant fire power of 1.

4.3 Feature 3 – Non-stop anti-gravity movement

BMB shall use anti-gravity movement.

4.3.1 Description and Priority

Anti-gravity movement is used to keep a distance to certain points on the battlefield. BMB shall use this movement to stay away from enemy robots. Furthermore, BMB shall never stay at one position.

Business priority: **medium**
Implementation risk: **medium**

4.3.2 Functional Requirements

REQ-F3-1 BMB shall continuously move away from enemy robots.

REQ-F3-2 BMB shall never stay in the same position for more than 25 consecutive turns.

4.4 Feature 4 – Wall avoidance

BMB shall avoid driving into walls.

4.4.1 Description and Priority

Crashing into walls damages robots and forces them into a stop. BMB shall not end up in walls, even when the anti-gravity movement suggests such positions.

Business priority: **medium**
Implementation risk: **medium**

4.4.2 Functional Requirements

REQ-F4-1 When closer than 40 distance units to a wall, BMB shall alter its course to avoid collision.

5 Quality Requirements

This section describes quality requirements for Basic Melee Bot. The robot is primarily intended for use in the LU Rumble, but it shall also be competitive in 1-vs-1 battles and melee battles.

5.1 1-vs-1 Battle Performance Requirements

When Basic Melee Bot battles against a single enemy robot, it will continuously change its position on the battlefield and stay away from the enemy robot by using its non-stop anti-gravity movement. Basic Melee Bot shall perform well against the Robocode sample robots.

REQ-Q1 Basic Melee Bot shall have at least 75% win rate against SpinBot.

5.2 Melee Battle Performance Requirements

When Basic Melee Bot battles against multiple enemy robot, it will try to stay away from enemy robots by using its non-stop anti-gravity movement. Basic Melee Bot shall perform well in melee battles against the Robocode sample robots.

REQ-Q2 Basic Melee Bot shall have at least 33% win rate in melee battles against three enemy SpinBots.

5.3 Software Quality Attributes

To be written...
<Specify any additional quality characteristics for the product that will be important to either the customers or the developers. Some to consider are: maintainability, testability, source code size, and adherence to Java code conventions.>

6 Other Requirements

To be written...
<Define any other requirements not covered elsewhere in the SRS. This might include database requirements, internationalization requirements, legal requirements, reuse objectives for the project, and so on. Add any new sections that are pertinent to the project.>

Appendix A: Glossary

BMB Basic Melee Bot, i.e., the robot whose requirements are specified in this document.

Radar action A robot action that explicitly scans the battleground for enemy targets.

SRS Software Requirements Specification.

TBD To be determined. These items are described in Appendix B.

Appendix B: To Be Determined List

This list describes all TBDs that remain in the SRS.

1. The implementation of color according to ETSA02 RoboTalk.