**RoboWars**

**Final Report**

**Draft #1**

**SYSC 4907  
April 7th, 2011  
Project #34  
  
Alexander Craig - 100741774  
Alexander Dinardo - 100737587  
Steven Legere - 100735141  
Mike Wright - 100741876  
  
Supervised by Cheryl Schramm**

Contents

[1 – Introduction (Alex Craig) 4](#_Toc288392652)

[2 - The Engineering Project (Steve Legere) 4](#_Toc288392653)

[2.1 Health and Safety 4](#_Toc288392654)

[2.2 Engineering Professionalism 4](#_Toc288392655)

[2.3 Project Management 4](#_Toc288392656)

[2.4 Individual Contributions 4](#_Toc288392657)

[2.4.1 Project Contributions 4](#_Toc288392658)

[2.4.2 Report Contributions 5](#_Toc288392659)

[3 – Background and Terminology 5](#_Toc288392660)

[3.1 – Android Operating System (Steve Legere) 5](#_Toc288392661)

[3.2 – LEGO Mindstorm NXT 2.0 (Mike Wright) 5](#_Toc288392662)

[3.3 – Augmented Reality (Alex Dinardo) 5](#_Toc288392663)

[4 – Requirements (Alex Craig) 5](#_Toc288392664)

[5 – Overall System Architecture (Alex Craig) 5](#_Toc288392665)

[6 – Server Implementation 5](#_Toc288392666)

[6.1 – User and Robot State Management and Data Propagation (Alex Craig) 5](#_Toc288392667)

[6.2 – Live Media Streaming (Alex Craig) 5](#_Toc288392668)

[6.3 – Virtual World Model Implementation (Alex Dinardo) 5](#_Toc288392669)

[7 – Robot Client Implementation (Mike Wright) 5](#_Toc288392670)

[7.1 – LeJOS and Modifications (Mike Wright) 5](#_Toc288392671)

[7.2 – Dead Reckoning and Dot-Grid Error Correction (Mike Wright) 5](#_Toc288392672)

[8 – Android Client Implementation 5](#_Toc288392673)

[8.1 – Android Libraries and Application Layout (Steve Legere) 5](#_Toc288392674)

[8.2 – OpenGL Rendering (Steve Legere) 5](#_Toc288392675)

[9 – Testing 5](#_Toc288392676)

[9.1 – Server Side Testing (Alex Dinardo) 5](#_Toc288392677)

[9.1.3 – Unit Testing (Alex Dinardo) 5](#_Toc288392678)

[9.1.4 – Integration Testing (Alex Dinardo) 6](#_Toc288392679)

[9.2 – Robot Client Testing (Mike Wright) 6](#_Toc288392680)

[9.3 – Android Client Testing (Steve Legere) 6](#_Toc288392681)

[10 – Conclusion (Mike Wright) 6](#_Toc288392682)

[Appendix A – Use Cases 6](#_Toc288392683)

[Appendix B – Use Case Realizations (Sequence Diagrams) 6](#_Toc288392684)

[Appendix C – Schedule Gantt Chart 6](#_Toc288392685)

[Appendix D – Class Diagrams 6](#_Toc288392686)

# 1 – Introduction (Alex Craig)

* Introduce problem area
* Problem motivation (goals)
* Problem statement
* Proposed solution
* Accomplishments
* Report overview

# 2 - The Engineering Project (Steve Legere)

## 2.1 Health and Safety

* Not terribly relevant

## 2.2 Engineering Professionalism

## 2.3 Project Management

* Phased incremental lifecycle
* Heavy emphasis on design work before beginning implementation
* Three stages of development with time scheduled for testing for each phase
* Discuss and reference Gantt chart

## 2.4 Individual Contributions

### 2.4.1 Project Contributions

### 2.4.2 Report Contributions

# 3 – Background and Terminology

## 3.1 – Android Operating System (Steve Legere)

## 3.2 – LEGO Mindstorm NXT 2.0 (Mike Wright)

## 3.3 – Augmented Reality (Alex Dinardo)

# 4 – Requirements (Alex Craig)

# 5 – Overall System Architecture (Alex Craig)

# 6 – Server Implementation

## 6.1 – User and Robot State Management and Data Propagation (Alex Craig)

## 6.2 – Live Media Streaming (Alex Craig)

## 6.3 – Virtual World Model Implementation (Alex Dinardo)

# 7 – Robot Client Implementation (Mike Wright)

## 7.1 – LeJOS and Modifications (Mike Wright)

## 7.2 – Dead Reckoning and Dot-Grid Error Correction (Mike Wright)

# 8 – Android Client Implementation

## 8.1 – Android Libraries and Application Layout (Steve Legere)

## 8.2 – OpenGL Rendering (Steve Legere)

# 9 – Testing

## 9.1 – Server Side Testing (Alex Dinardo)

### 9.1.3 – Unit Testing (Alex Dinardo)

### 9.1.4 – Integration Testing (Alex Dinardo)

## 9.2 – Robot Client Testing (Mike Wright)

## 9.3 – Android Client Testing (Steve Legere)

# 10 – Conclusion (Mike Wright)

# Appendix A – Use Cases

# Appendix B – Use Case Realizations (Sequence Diagrams)

# Appendix C – Schedule Gantt Chart

# Appendix D – Class Diagrams