Transformer Darwin (#001)

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Test-and-Evaluation Document

DARwIn-OP (Spring/Summer 2017)

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1 INTRODUCTION

1.1 PURPOSE OF THIS DOCUMENT

This document is a test-and-evaluation (T&E) analysis. It measures the design performance of project. Moreover, this document evaluates the testing procedure based on the TDR's.

2 TESTING PLANS (PRE-T&E)

- Speed/Locomotion comparison:
    - TEST #1s: With a ruler on the ground and a stop watch DARwin will freely roll strait forward until a specified distance on a smooth floor (Linoleum). Than with the same setup DARwin will walk (build-in walking algorithm). Comparisons on speed will be made based on both performance.
    - TEST #2s: With a ruler on the ground and a stop watch DARwin will freely roll strait forward until a specified distance on a mid-rough floor (Wood Pallets). Than with the same setup DARwin will walk (build-in walking algorithm). Comparisons on speed will be made based on both performance.
    - TEST #3s: With a ruler on the ground and a stop watch DARwin will freely roll strait forward until a specified distance on a rough floor (Carpet). Than with the same setup DARwin will walk (build-in walking algorithm). Comparisons on speed will be made based on both performance.
- Battery Life:
    - TEST #1b: By using a treadmill and a stopwatch. DARwin (in a rolling mode) will be placed on the treadmill then the time will be measure until the low battery alarm goes off. Hence, the rolling motion operational time ought to be determined.
- Assembling Transformer DARwin effectiveness:
    - TEST #1a: By using a stop watch 3 people will be tasked to assemble Transformed DARwIn based onto a "Construction Manual". When they are finished they time will be recorded and survey will be given to them. They survey will contain questions like: How easy it was to understand the assembling instructions? How easy was to use the tools provided? Do you have any suggestion to make the building process faster/easier ?

- Software manipulation:
    - TEST #1s: Three people will be tasked to install Transformer Darwin packaged onto DARwin by watching a step by step video. They will be timed during this tasked. At the end the evaluator will observe the challenges that the guinea-pigs may have encountered.
- Plow Plates effectiveness:
    - TEST #1p: Piles of (200g) of sand will be located at an even flat surface, and then a ruler will be placed on the ground in order to measure the distance on which DARwin-op can push the sand. Thus, a stop watch will be used to monitor the time. Therefore the speed can be easily calculated afterwards.
    - TEST #2p: Wood blocks ranging "20x70x25 mm" will be laid on an even flat surface, and then a ruler will be placed on the ground in order to measure the distance. Finally, a stop watch will be used to monitor the time. Therefore the speed can be easily calculated afterwards.

2.1 ASSEMBLING TEST

In order to assess how long it takes to assemble the wheels on DARwIn-OP. Moreover a stopwatch was used to measure the time which 3 subjects used to assemble the wheels by following the draft Instruction Manual (found at: http://www.daslhub.org/unlv/wiki/lib/exe/fetch.php?media=transformer_darwin-op_manualv2.pdf). The table bellow lists the outcome of such tests. Each subject were given only the tools, materials and an instruction manual. The test indicates that it takes an average of 14.66 min to assemble the both wheels. Furthermore, such average is within our predicted threshold.

Subjects	Time
Person 1	13.34 min
Person 2	14.78 min
Person 3	15.87 min

THIS TEST ought to be repeated for full assembly(this is just an trial)

For the full assembly test a survey will be available after the test. Moreover 3 subjects will use the instruction manual, whereas the other 3 will use the You-tu-be video.

1.1 REFERENCES

1.2 OVERVIEW

2 SYSTEM OVERVIEW

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2.2 SYSTEM ARCHITECTURE

2.3 INFRASTRUCTURE SERVICES

3 SYSTEM DESIGN

3.1 DESIGN METHOD AND STANDARDS

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3.5 SOFTWARE DEVELOPMENT TOOLS

3.6 OUTSTANDING ISSUES

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4.1.1 Type

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DOCUMENT CONTROL

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