**GNG1103 Project**

Group A12

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Deliverable C

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| Number | Interpreted Need | Design Criteria | Priority |
| 1 | Bowie Is able to traverse water | Weight (lbs)  Able to float  Able to move on water  Is not harmed by water | 6 |
| 2 | Bowie is able to observe and interpret his surrounding environment more effectively | Ability to interpret surroundings without outside help | 2 |
| 3 | Bowie has somewhere to stay overnight | Secured shelter.  Overnight charging system.  A way to identify when battery needs to be charged | 5 |
| 4 | Bowie is less reliant on human assistance. | Battery capacity  Battery charging rate//time.  Autonomous  A way to separate and dispose the sand from the garbage holder  Make Bowie more powerful | 1 |
| 5 | Bowie is able to safely interact with surrounding wildlife | Silent operation  Able to detect objects  Eco-friendly | 2 |
| 6 | Bowie is able to operate during the night time | High powered LED lights.  Night vision. (Ability to see at night)  Some way to prevent vandalism/theft | 4 |
| 7 | Bowie is low cost. | Cost efficiency ($) | 3 |

We thought that making bowie less reliant on human assistance was the most important need because it would allow bowie to be as efficient as possible and bowie would no longer the need for humans to check up on it every so often. This would also further his functionality, and allow for consumer use in the future. The second most important need was to be able to interpret surrounding environment and wildlife, this was because it would allow bowie to avoid obstacles that could potentially cause it to slow down. Our third most important need was the cost. We felt that this was an priority because Erin made it clear that parts should be low-cost and reproducible within a Makerspace if possible. Another important need was to be able to operate during the nighttime. We decided this to be important because it would allow Bowie to do as much cleaning as possible. We felt that give any extra time, we could potentially make it so Bowie was able to operate on water, or to provide Bowie with overnight storage/charging space. This isn’t much of a priority right now, because Bowie is still in early stages of development, and we felt that currently improving upon Bowie’s current functionality was more important than these things.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Design Specifications | Relation (=,< or >) | Value | Units | Verification Method |
| **Functional Requirements** |  |  |  |  |
| Ability to Float | = | Yes | N/A | Place robot in H2O |
| Isn’t Harmed by water | = | Yes | N/A | Test |
| Battery Capacity | > | 5 | Hours | Test/Find Quality Batteries |
| **Constraints** |  |  |  |  |
| weight | < | 12 | lbs | Weigh the robot |
| Cost | < | 1000 | ($) | Estimate, Final check |
| Material |  |  | N/A | Stress and strain test |
| Motor power | > |  | cc | Do a dyno run |
| Speed | > | 0.4 | m/s | Test and calculate the distance travelled per unit time. |
| **Non Functional Requirements** |  |  |  |  |
| Aesthetic | = | Yes | N/A | Survey  Take open opinions from commoners. |
| Quiet/ Less noisy Resting Volume | < | 30 | dB | Test |