# Sumo Robotics

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# Description: Sumorobot 3kg (R/C)

Two Sumorobots challenge in a head-to-head match. With following the rules of sumo matches

| Class | Height | Width | Length | Weigh |
|---|---|---|---|---|
| **Mega Sumo - R/C** | unlimited | 20.0 cm | 20.0 cm | 3,000 g |

**Table 1: Measurements**

**Specification:-**

- R/C Controlled Sumo robot
- Qualified of following the competition “Rules”
- Following (Width/Length/Weigh) limitations

# Sponsorship of the project & Client

-Our Sponsor of the Sumorobot competition will be Northern Arizona University.

-Team 18F06 will prove to accomplish all necessary requirement of the sumo bot competition as undergraduates of ME students.

-The client will be the ROBOGAMES Competition.


Figure 1: NAU Logo


Figure 2: ROBOGAMES Logo

# Newest Generation Sumobot "SandFlea" created by Boston dynamics

Specifications:-

- Battery & Propane powerd
- Weigh: 5kg, Height: 15cm, Joints: 5

Capabilities:-

- Jumps 10m
- 25 Bounces per charge

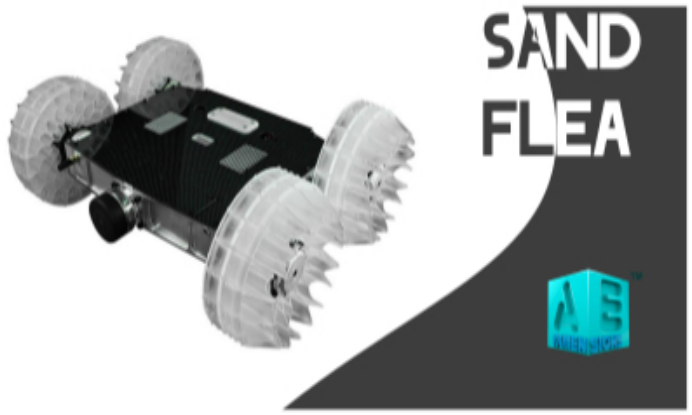



Figure 3: Sand Flea

# Other similar low-budget sumobot

- *Low-cost 90$*
- *Bluetooth controlled Sumobot*
- *Competition ready*


Figure 4: Android sumobot

# Design Requirements

a. Short charging time with long battery life.
- Lasts 3 rounds each round is 3 minutes.

b. R/C robot that does not have sticky substances

c. Artbot prepared and Creative Design.

d. No hazardous & dangerous material

e. The controller does not exceed 75Mhz.

# Customer Requirements

| 1. R/C Robot | Weight |
|---|---|
| I. Weigh | 5 |
| II. Durability | 3 |
| III. Portable | 4 |
| IV. Simplicity | 2.5 |
| V. Pausing Capabilities | 3 |
| VII. RC Controlled | 5 |
| VIII. Safety | 4 |

Table 2:- Measurements

# Engineering Requirements.

| • **Engineering Requirements** |
| --- |
| • Maintenance |
| • Remote Controlled |
| • Autonomous |
| • Torque |
| • Consistency |
| • Cost |
| • Minimizing Weight |
| **Size** |
| Power Source |
| Motor |

Table 4: ENG Requirements.

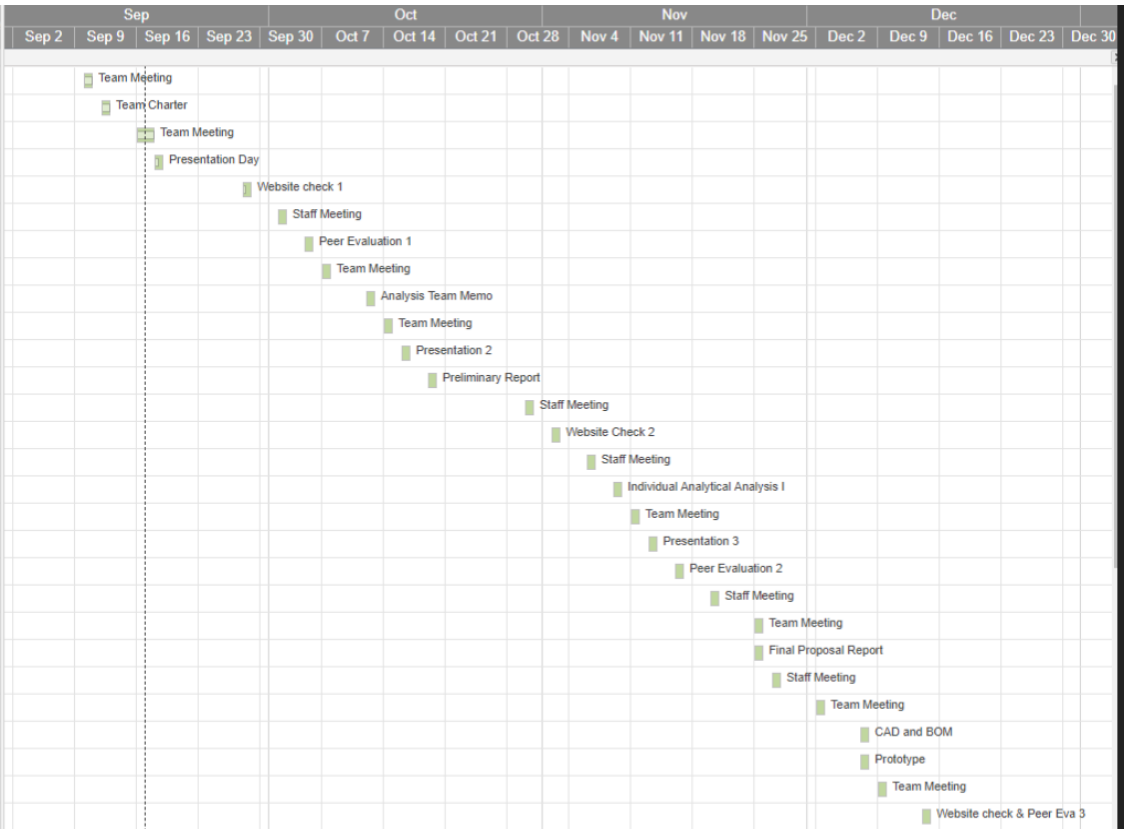
# House of Quality

| 1 | House of Quality (HoQ) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | | | | | | | | | | | | | |
| 3 | **Customer Requirement** | **Weight** | **Engineering Requirement** | Maintanance | Remote Controlled | Autonomous | Torque | Constancy | Cost | Minimizing Weigh | size | Power Source | Motor |
| 4 | Weigh | 5 | | 1 | 3 | 9 | | 3 | | 9 | 9 | 3 | 9 |
| 5 | Durability | 3 | | 9 | 3 | | 9 | 9 | 3 | 3 | 1 | 3 | 9 |
| 6 | Portable | 4 | | 9 | 1 | | | 1 | 3 | 9 | 3 | 3 | 3 |
| 7 | Simpicity | 2.5 | | 9 | 3 | 3 | 3 | 1 | 3 | 3 | 9 | 9 | 3 |
| 8 | Pausing Capabilities | 3 | | 3 | 9 | 1 | | 3 | | 3 | | 3 | 9 |
| 9 | RC Controlled | 5 | | 9 | 9 | 3 | 3 | 3 | 9 | 1 | | 3 | 9 |
| 10 | Safety | 4 | | 3 | | 3 | 1 | 1 | 3 | 1 | 1 | 9 | 9 |
| 11 | **Absolute Technical Importance (ATI)** | | | 156.5 | 107.5 | 82.5 | 54 | 76.5 | 85.5 | 115.5 | 86.5 | 103.5 | 199.5 |
| 12 | **Relative Technical Importance (RTI)** | | | 2 | 4 | 8 | 10 | 9 | 7 | 3 | 6 | 5 | 1 |
| 13 | **target unit of measurment** | | | no unit | frequer | no unit | N*m | no unit | USD | g | cm | Watt | TBD |
| 14 | **Target ER values** | | | N/A | N/A | TBD | TBD | N/A | 1000 | 3000 | 20*2( | TBD | TBD |
| 15 | **Tolerances of Ers** | | | N/A | N/A | N/A | ± 0.1 | | <100 | <3000 | <20*2 | ± 0.2 | TBD |

Table 4: HoQ.

# Gantt Chart

| | Task Name | Start Date | End Date | Duration | Predecessors | % Complete | Status |
|---|---|---|---|---|---|---|---|
| 1 | Team Meeting | 09/10/18 | 09/10/18 | 1d | Team | 100% | Completed |
| 2 | Team Charter | 09/12/18 | 09/12/18 | 1d | Team | 100% | Completed |
| 3 | Team Meeting | 09/16/18 | 09/17/18 | 2d | Team | 100% | Completed |
| 4 | Presentation Day | 09/18/18 | 09/18/18 | 1d | Team | 50% | In Progress |
| 5 | Website check 1 | 09/28/18 | 09/28/18 | 1d | Jasim | 20% | In Progress |
| 6 | Staff Meeting | 10/02/18 | 10/02/18 | 1d | Team | | Not Started |
| 7 | Peer Evaluation 1 | 10/05/18 | 10/05/18 | 1d | Individual | | Not Started |
| 8 | Team Meeting | 10/07/18 | 10/07/18 | 1d | Team | | Not Started |
| 9 | Analysis Team Memo | 10/12/18 | 10/12/18 | 1d | Team | | Not Started |
| 10 | Team Meeting | 10/14/18 | 10/14/18 | 1d | Team | | Not Started |
| 11 | Presentation 2 | 10/16/18 | 10/16/18 | 1d | Team | | Not Started |
| 12 | Preliminary Report | 10/19/18 | 10/19/18 | 1d | Team | | Not Started |
| 13 | Staff Meeting | 10/30/18 | 10/30/18 | 1d | Team | | Not Started |
| 14 | Website Check 2 | 11/02/18 | 11/02/18 | 1d | Jasim | | Not Started |
| 15 | Staff Meeting | 11/06/18 | 11/06/18 | 1d | Team | | Not Started |
| 16 | Individual Analytical Analysis I | 11/09/18 | 11/09/18 | 1d | Individual | | Not Started |
| 17 | Team Meeting | 11/11/18 | 11/11/18 | 1d | Team | | Not Started |
| 18 | Presentation 3 | 11/13/18 | 11/13/18 | 1d | Team | | Not Started |
| 19 | Peer Evaluation 2 | 11/16/18 | 11/16/18 | 1d | Individual | | Not Started |
| 20 | Staff Meeting | 11/20/18 | 11/20/18 | 1d | Team | | Not Started |
| 21 | Team Meeting | 11/25/18 | 11/25/18 | 1d | Team | | Not Started |
| 22 | Final Proposal Report | 11/25/18 | 11/25/18 | 1d | Team | | Not Started |
| 23 | Staff Meeting | 11/27/18 | 11/27/18 | 1d | Team | | Not Started |
| 24 | Team Meeting | 12/02/18 | 12/02/18 | 1d | Team | | Not Started |
| 25 | CAD and BOM | 12/07/18 | 12/07/18 | 1d | Team | | Not Started |
| 26 | Prototype | 12/07/18 | 12/07/18 | 1d | Team | | Not Started |
| 27 | Team Meeting | 12/09/18 | 12/09/18 | 1d | Team | | Not Started |
| 28 | Website check & Peer Eva 3 | 12/14/18 | 12/14/18 | 1d | Individual | | Not Started |



# Budget

- No Specific Budget
- Ranges between 1000~2000
- Recycling many parts of previous projects


Figure 5: Budget Plan

# Questions?

# References


- https://www.instructables.com/id/Android-Controlled-Bluetooth-Sumobot-Ultimate-DIY-/
- http://blog.aedimensions.com/sand-flea-the-jumping-robot/
- https://www.bostondynamics.com/sandflea
- http://robogames.net/index.php