Sumo Bot Competition

4:00 P.M. , September 27, 2016 , Dubious Center RM 19

Team 21

Rene Diyarza	- Project Manager
David Feetterer	- Budget Liaison
Jose Villegas	- Website Developer
Yousef Alghareeb	- Client Contact

Project Description

Two robots compete in a head-to-head match following the basic system of traditional human sumo matches.

NAU is our primary sponsor financially and managerially

Showcase our skills obtained from the undergraduate program at NAU

NORTHERN ARIZONA UNIVERSITY®

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State of the Art

The technology progressing real fast allowing us to make robots with high expectations.

Coding languages became more efficient and coding nowadays more easier than before

Progress in technology made boards, motors, etc.; smaller than in the past which give the user the chance to make robots with smaller dimensions.

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Background

- Three classes: Autonomous, Nano & R/C

- Bots will be competing in a sumo competition.

- Each class has its limitations

- Each robot will compete against another to try to push the opponent out the ring (Dohyo)

- Must have sensors if an autonomous bot and a remote if an R/C class

- Bartending bot must be creative and designed to exceed expectations

- Team is currently doing research for each individual robot

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Benchmarking

Patrick McCabe Makes
NanoBot

Robot was completely
created by two guys
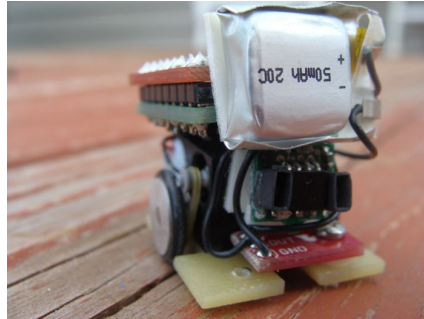hundreds of miles apart [1]

Figure 1: NanoBot

2002 High School sumo
competition

20lb limit

Powered by lawn mower
battery [3]

Figure 3: SumoBot

Stampy Autonomous bot

Was design for DC sumo
competition
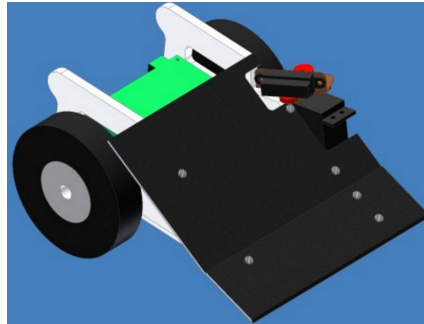
Had limited speed and strength
for competition [2]

Figure 2: Autonomous Bot

Dave Zucker's bartending bot

Received arm as a gift

Had malfunctioning parts

Fixed and made a debut at
engineer's birthday party [4]

Figure 4: BartendingBot

JV

Design Requirements

Weight and dimension limit per class

- R/C and autonomous robot mass $\leq$ 3000g; width, length $\leq$ 20cm
- Nano robot width, height and length $\leq$ 2.5cm, mass $\leq$ 25g

Long lasting battery life

- At least 15 minutes without recharging

Robots to be autonomous with the exception of the R/C, must be remotely controlled

Durable

Creative design

R/C robot cannot have a controller that contains a frequency of 75mhz

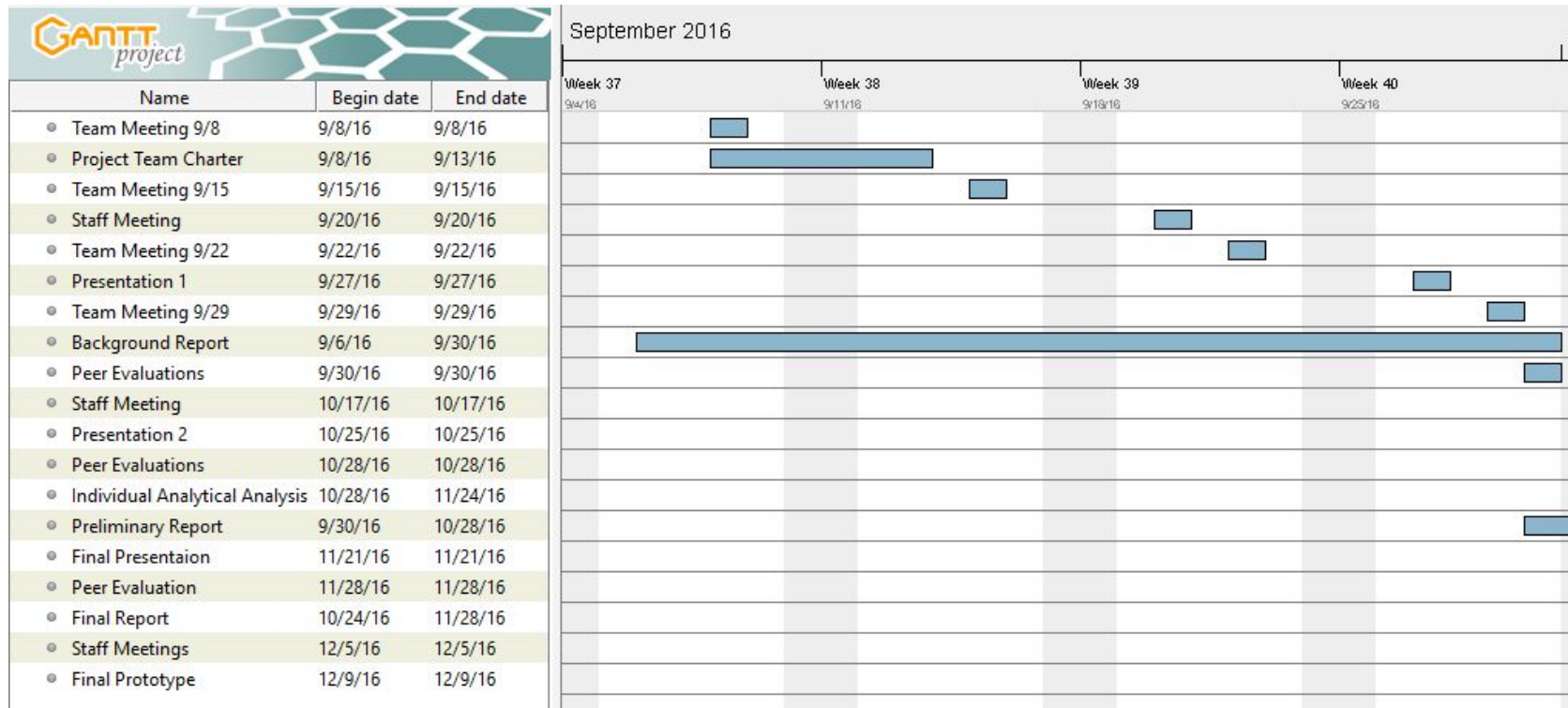Bartending bot must be able to make more than one drink

YA

Weightings

Table 1. CR's and Weightings

1. R/C robot	
i. Creative Design	3
ii. Quality Engineering	4
ii. Dimensional Limitations	2
iv. Long Battery Life	1

2. Autonomous robot	
i. Long Battery Life	3
ii. Line and opponent sensors	4
iii. Controllerless	1
iv. Durability	5
v. Timing	6
vi. Weight	2

3. Nano robot (Autonomous)	
i. Long Battery Life	5
ii. Dimensional Limitations	1
iii. Weight Limitations	2
iv. Delayed Start	3
v. Durability	4
vi. Creative Design	6

4. Bartending robot	
i. Aesthetically Pleasing	2
ii. Creative Design	4
iii. Execution	1
iv. Versatitily	3

Scale runs on 1 being the most important while the higher the number, the least important

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Schedule

Table 2. Gantt Chart

Name	Begin date	End date
Team Meeting 9/8	9/8/16	9/8/16
Project Team Charter	9/8/16	9/13/16
Team Meeting 9/15	9/15/16	9/15/16
Staff Meeting	9/20/16	9/20/16
Team Meeting 9/22	9/22/16	9/22/16
Presentation 1	9/27/16	9/27/16
Team Meeting 9/29	9/29/16	9/29/16
Background Report	9/6/16	9/30/16
Peer Evaluations	9/30/16	9/30/16
Staff Meeting	10/17/16	10/17/16
Presentation 2	10/25/16	10/25/16
Peer Evaluations	10/28/16	10/28/16
Individual Analytical Analysis	10/28/16	11/24/16
Preliminary Report	9/30/16	10/28/16
Final Presentaion	11/21/16	11/21/16
Peer Evaluation	11/28/16	11/28/16
Final Report	10/24/16	11/28/16
Staff Meetings	12/5/16	12/5/16
Final Prototype	12/9/16	12/9/16

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Budget

Project's budget

- ○ Provided: $ 1000
- ○ Prospective Sponsors: Mother Road, Lumberyard, Hops On Birch

Anticipated expenses

- ○ Entry Fees: $ 190
- ○ Electronics (Microcontrollers, Motors, Sensors, Batteries, ESC, Power Transmission): $ 200/robot
- ○ Building Materials: $ 80

Remaining Balance: $1000

Questions and Answers

References

(1) "Nano Sumo Robot." *Nano Sumo Robot*. N.p., n.d. Web. 23 Sept. 2016.

(2) By Imposing Speed Limits on All Robots, It Eliminates the 'smash and Bash' in Exchange for. "How to Build a Robot Tutorials - Society of Robots." *How to Build a Robot Tutorials - Society of Robots*. Society of Robots, n.d. Web. 23 Sept. 2016

(3) Bennett, Jon. "JBProjects.net." *Sumo Robot*. JBProjects, n.d. Web. 23 Sept. 2016.

(4) Baichtal, John. "Sir Mix-a-Bot, the Robot Bartender | Make:." *Make DIY Projects and Ideas for Makers*. Make:, 01 Apr. 2013. Web. 23 Sept. 2016.