Sumo Bot Competition

4:00 P.M. , November 29, 2016 , Dubois Center RM 19

Team 21

Rene Diyarza   - Project Manager

David Feetterer   - Budget Liaison

Jose Villegas   - Website Developer

Yousef Alghareeb - Client Contact

Project Description

Four different types of robots must be design for four different types of competition.

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

JV

Design description(Autonomous)

- Robot starts moving forward.
- Line or opponent Detectors receive signal.
- Signals will be sent to the controller.
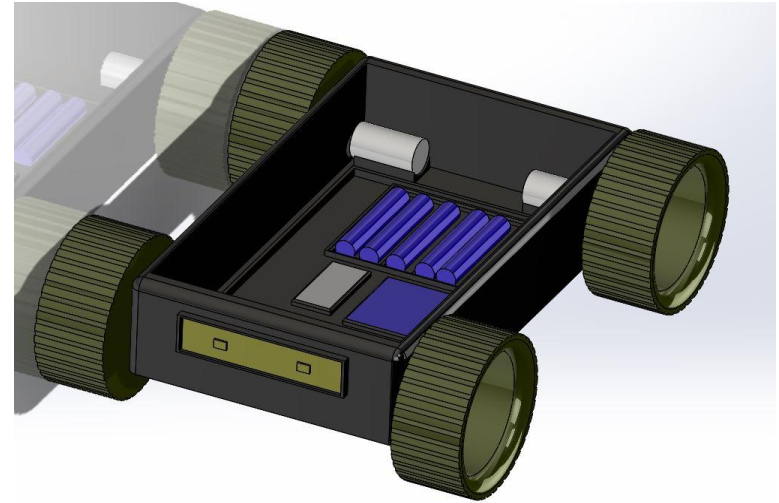- Controller will send signal to motor driver to start rotating motors.

Figure 1: Autonomous Robot

YA

Design requirements(Autonomous)

- 4 motors provide more pushing force.
- Total weight is less 3 kg.
- Length and width are less than 20 cm.
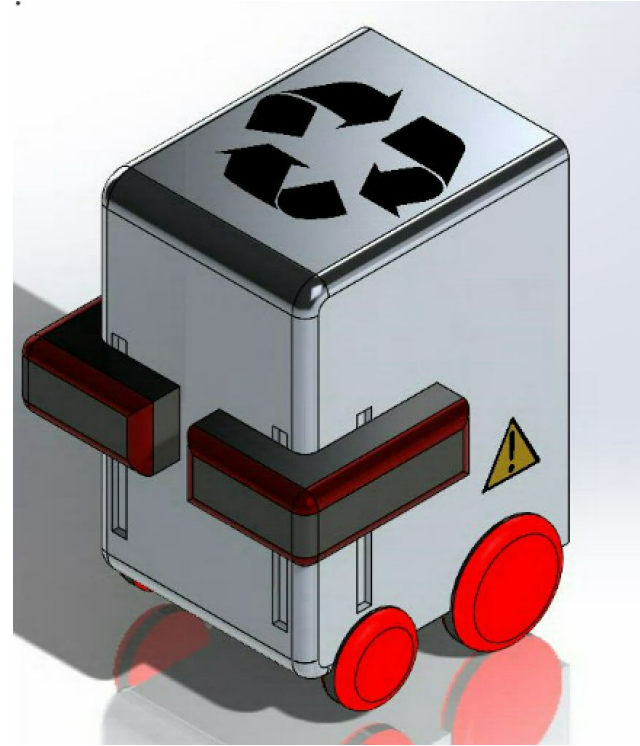- The robot is able to act independently through matches.

Table 1 : Autonomous CR

customer requirments	weight
weight (3000 < g)	5
dimension limitations	5
pushing opponent	3
independently acting	4
durability	3

YA

Design description (R/C)

Highlighted Specifications
- Independent 4-wheel drive
- Adjustable bumpers focusing on impact
- Design leans forward for improved balance
- Controlled by R/C remote
- Rubber wheels for traction

In operation
- Controlled by user with R/C remote

4

JV

Design requirements (R/C)

- Mass ≤ 3000 grams
- Length & width ≤ 20 cm
- Height: unlimited
- Must be remoted controlled
- R/C remoted cannot be 75 Mhz
- Must be digitally-mated paired

Design description (Nano)

Structural/Drive
- PLA 3D printed uni-body
- Wedged front scoop
- Compartmentalized interior
- Independent two wheel drive with 4:1 gear ratio
- Front supported by 3 spherical casters.
- Optimized center of mass.

Operational Algorithm
- Spiral pattern with conditional decreasing radii.
- Tactile switches on all faces as failsafe.

DF

Design requirements (Nano)

- M < 25g

- Total volume < 15.625 cm^3

- Generate maximum thrust

- Autonomous navigation

- Actively pursue opponent

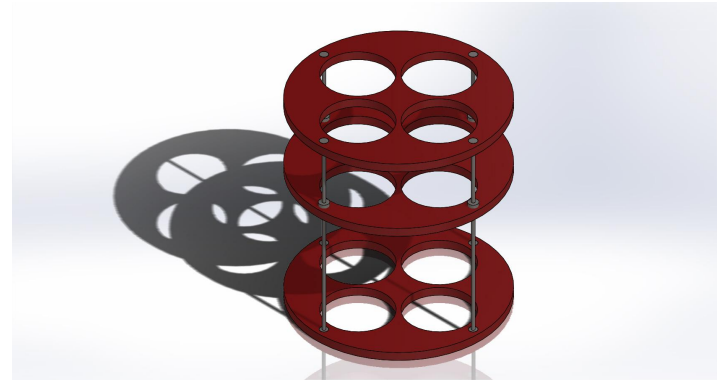- Resist failure (mass of broken
  components cannot exceed 5g)

DF
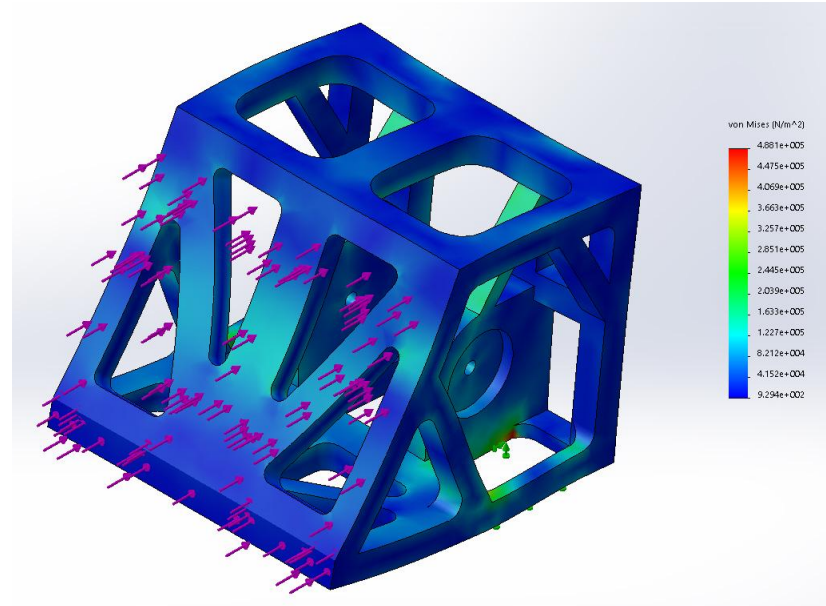
Design description (Bartending)

Structural/Components
- 3D printed components
- Bottom base capable to hold 4 bottles
- Sleek Design
- Feature 4 peristaltic pumps
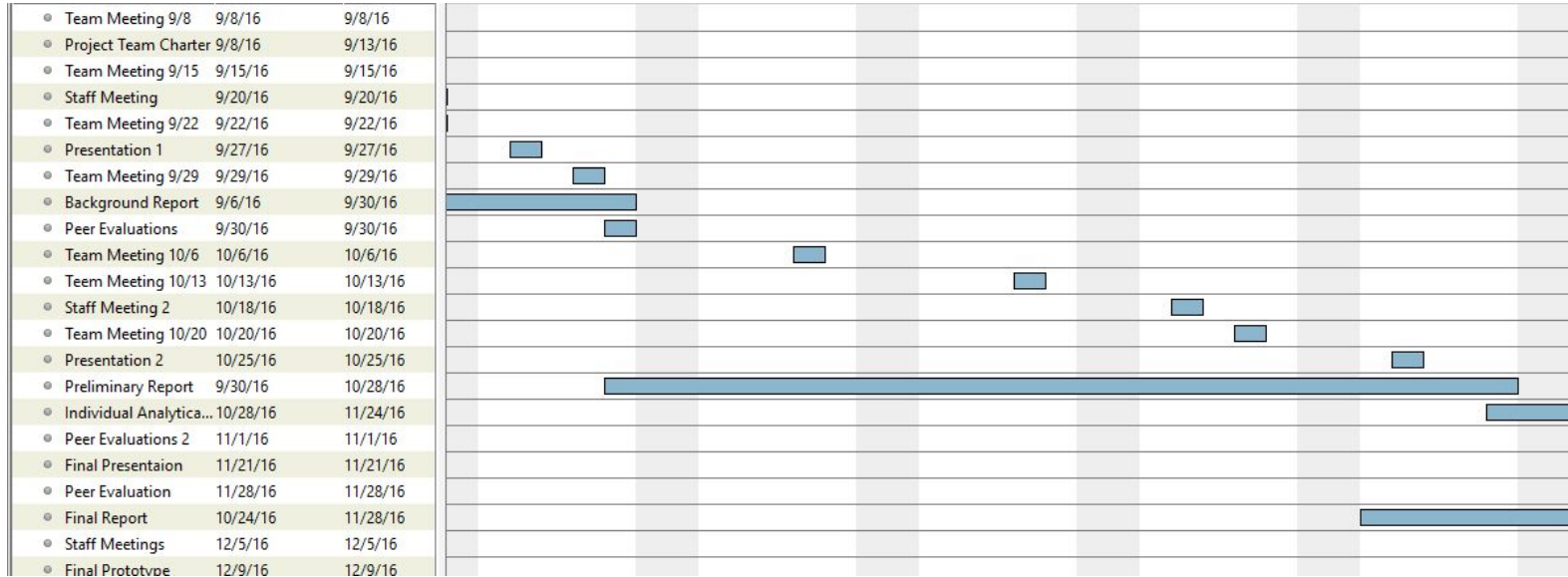- Tubing potential FDA approved

In Operation
- "Squeezes" liquid
- Provides at least 4 different drink combination

RD

Design requirements (Bartending)

- Flow Rate < 0.055 m^3/s

- Volume < 0.0956 m^3

- Weight < 2.5 kg

- Goals of the team
- No restrictions on the system

RD

Schedule

RD

Budget

Robot	Available Balance	Anticipated Expenses	Resulting Balance
3kg Autonomous	$ 375	$ 170	$ 205
3kg R/C	$ 375	$ 120	$ 255
Nano Autonomous	$ 375	$ 200	$ 175
Bartending	$ 375	$ 150	$ 225
Total	**$ 1500**	**$ 640**	**$ 860**

DF

Questions?