Project Rofi

Executive Summary

10/18/2012

Prioject Rofi's goal is to design and implement a fully dynamic biped robot. The first mission is to complete Rofi (Fith Generation Robot), which was developed by Jonathon Dowdal. Rofi is a partially dynamic robot that uses the accelerometer in an android tablet as the feedback sensor. Project Rofi will build this robot, and then change some of the features to better utilize the android phone as well as add a medium range IR sensor and a gyro.

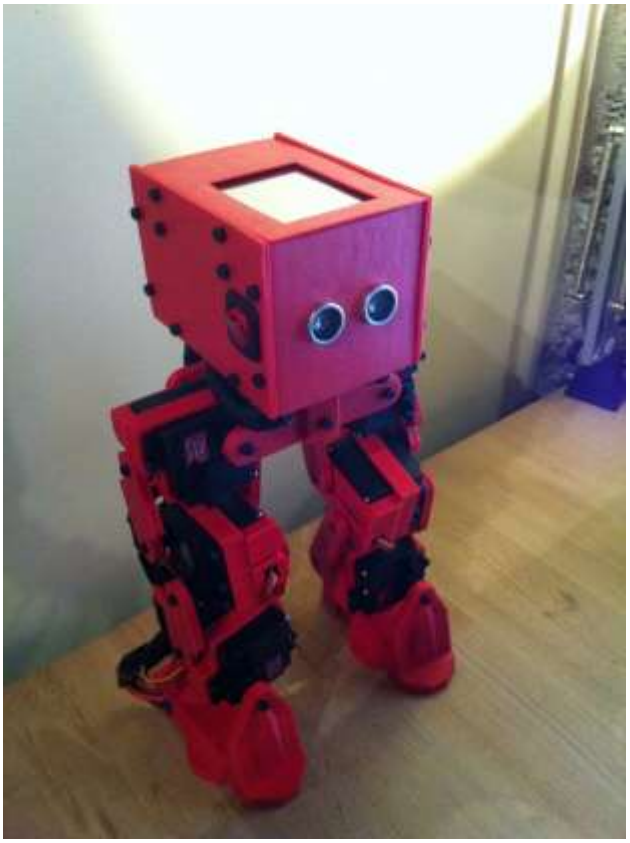
As mentioned before, Rofi is the next generation robot in a series of biped robots. Its predecessor, FOBA, was built by the last semester's class and was a static machine. In order to fully understand the processes and differences between static and dynamic bipeds, FOBA must be restored to its proper working order. This task has been completed.

In order to keep costs down, FOBA was dismantled and scrapped for parts. This too has been completed. Every part has been ordered and received for Rofi, and the project is awaiting parts from the manufacturing team. Progress is slow, but is getting on track. The Maker Society has also been a valuable resource in attaining these goals. Project Rofi is scheduled to begin building Rofi on 10/18/2012 with the parts it has attained. Once the programs are posted, Rofi will be implemented.

The next generation biped, Darel (Dynamic Android Robot Engineering Long Beach), has a redesigned head, but will use the same legs as Rofi. This was done to keep the cost down, as well as to maintain the same basic walking frames. Furthermore, the feedback will be increased by using an external gyro along with the android's accelerometer to increase accuracy. Preliminary designs allow for the use of a variety of phones. This will allow the user to be able to download the app and control Darel with any phone. This app will check for phones features to be available for use since not all androids have the same features. Other feature's if schedule allows are implementing voice commands, wifi control, and using the android's camera. The cost of Rofi will be $233.40 minus the costs for plastic. This will allocate around $20-$50 for any unexpected costs, but these should be kept to a minimum.

The success of Darel will be based on three tests. First, Darel will be fully dynamic meaning it will fall when the power is turned off. Second, Darel will be able to walk up an incline. Third, Darel will be able to respond to a slight impulse; Similar to being pushed. These are lofty goals and time will be short, but by keeping a motivated and enthusiastic group, Project Rofi will be able to attain these goals and produce an inexpensive dynamic biped robot.

Rofi



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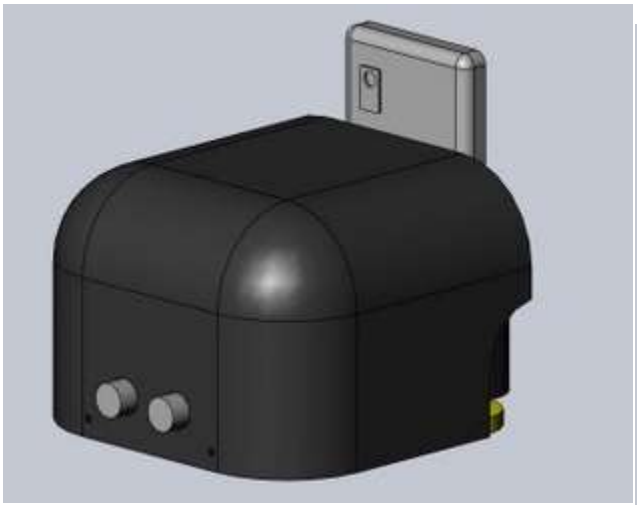

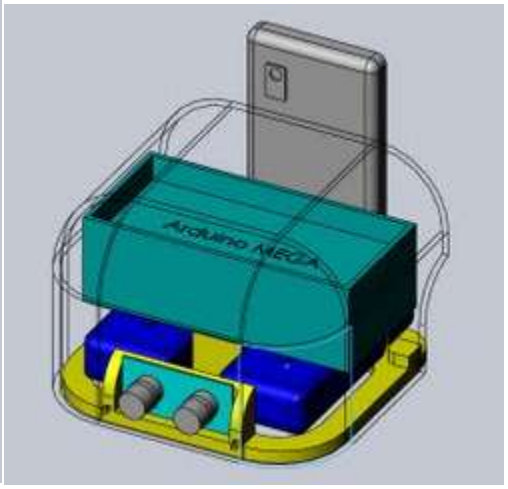

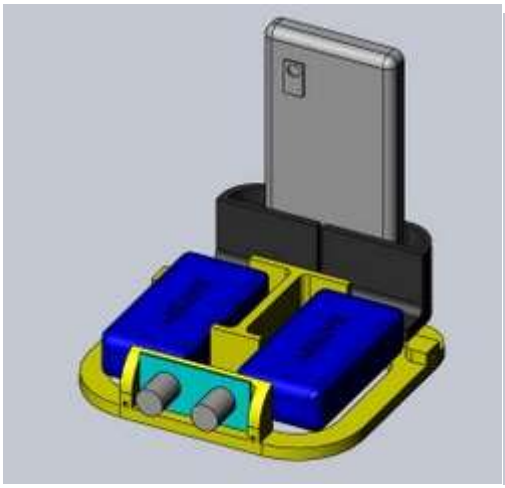

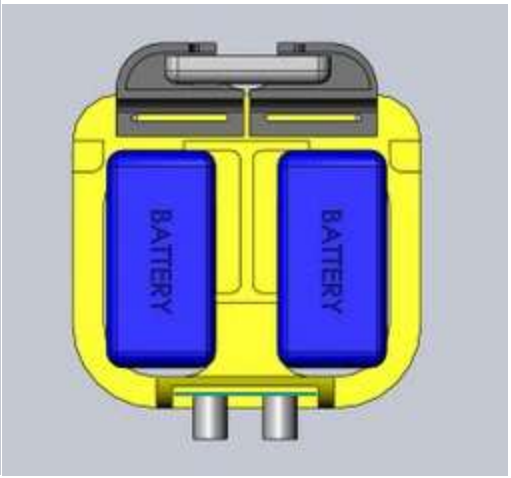
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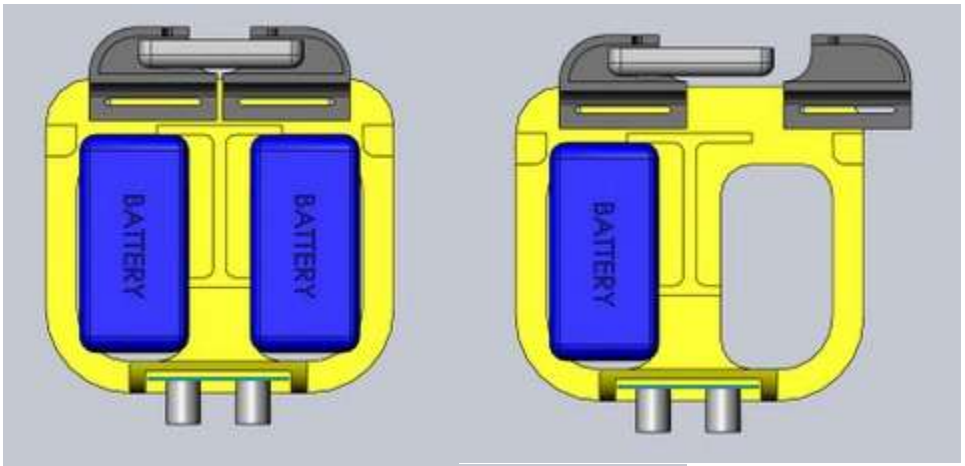
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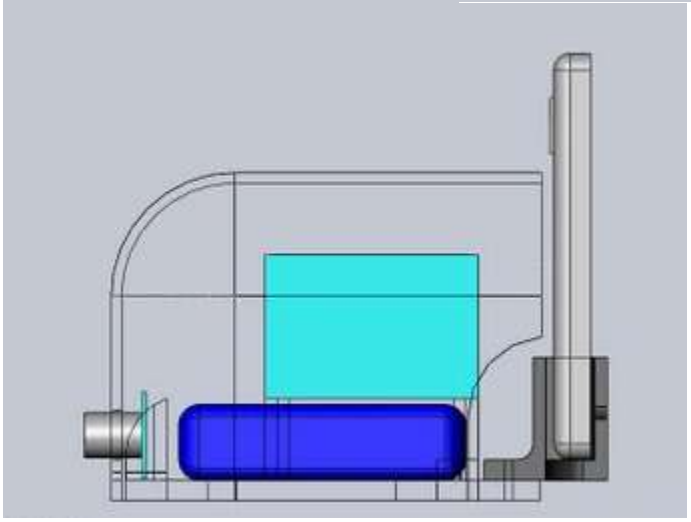
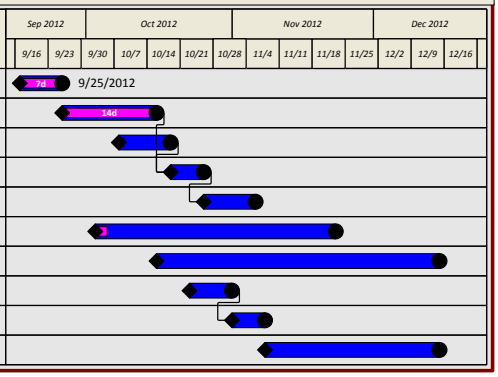


Team Biped

	Task Name	Start	Finish	Duration	% Complete
1	Get FoBa working	9/17/2012	9/25/2012	7d	100%
2	Order/Received Rofi Parts	9/26/2012	10/15/2012	14d	100%
3	Print RoFi Parts	10/8/2012	10/18/2012	9d	10%
4	Build RoFi	10/19/2012	10/25/2012	5d	0%
5	Implement RoFi	10/26/2012	11/5/2012	7d	0%
6	Design Next Generation RoFi Body Modifications	10/3/2012	11/22/2012	37d	5%
7	Improve Android "Brain" elements	10/16/2012	12/14/2012	44d	0%
8	Print/Order Parts for Next Generation	10/23/2012	10/31/2012	7d	0%
9	Build Next Generation	11/1/2012	11/7/2012	5d	0%
10	Implement Next Generation*	11/8/2012	12/14/2012	27d	0%



Item	Description	Provider	Part Number	Price	Qnty	Shipping	Total Cost	Running Cost
Break Away Right Angle 3x40	Used to connect Servos to Arduino	SparkFunk Electronics	COM-10095	$4.95	1	$3.64	$8.59	**$8.59**
55g/10kg/.20 sec	Servos for the leg joints	HobbyKing	MG996R/6221	$50.34	6	$9.99	$60.33	**$68.92**
UBEC-5A-HV (High Voltage Ultimate BEC)	Power supply	Hobby Partz	07E32-ExceedRC _UBEC-5A-V1	$23.75	1			
Gens Ace 4mm Banana Battery Connector	Battery to wire	Hobby Partz	98P-4mmBanana-For-Battery	$1.99	2			
JR TX 2.1mm to banana plug	Apator for battery and Rofi	Hobby Partz	79P-10043	$1.90	1			
Hitec Servo extention lead 150mm (5 pcs)	Extension wires for the servos	Hobby Partz	79P-10066	$1.80	3	11.98 + tax	$50.08	**$119.00**
623ZZ 10 Bearing Shielded 3x10x4	Bearings for the leg joints	VXB Bearings	623ZZ10	$16.60	1	$6.07	$22.67	**$141.67**
USB Host Shield	USB Host Shield	Circuits@Home		$25.00	1	$5.50	$30.50	**$172.17**
2.2lb (1kg) 1.75mm Black PLA Filament	For3D printing parts	Maker Farm Inc	1kgBlackPLA175	$39.00	2.2lb (1kg)			
2.2lb (1kg) 1.75mm Yellow PLA Filament	For 3D printing parts	Maker Farm Inc	1kgYellowPLA175	$39.00	2.2lb (1kg)	$17.15	$95.15	**$267.32**
Archos 28 4 GB Internet Tablet (Black)	Android "Brain"	Amazon.com	Archos 28 4 GB Internet Tablet (Black)	$56.30	1	$0+tax	$61.23	**$328.55**
Arduino Mega 2560 R3	Microcontroller	Amazon.com	Arduino Mega 2560 R3	$51.95	1	$0	$51.95	**$380.50**
POSSIBLE UNEXPECTED EXPENSES							~$50	**$430.50**
RANGE OF COST								**$430.50**