

Progress Presentation-I

e-Yantra Summer Internship-2016

Exploring WICED Sense

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- Project Title : Exploring WICED Sense
- Objective : To develop applications for Wiced Sense Tag and make a user friendly system which can be used in real world.
- Deliverables :
 - 1 Code to acquire data from wiced sense tag on local machine.
 - 2 Procedure for pushing the real time sensor data from wiced sense into database.
 - 3 Develop an effective algorithm for area mapping using Firebird V and wiced sense.
 - 4 Systematic documentation of developed codes and design procedures.

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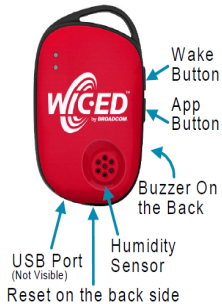
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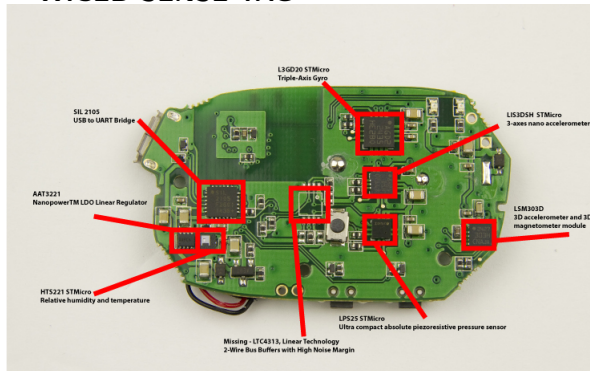
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WICED SENSE TAG



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What is BLE ? How is it different from other communication technologies ?

- Bluetooth 4.0 / Bluetooth Low Energy / Bluetooth Smart
- Lowest possible power consumption
- Specifically optimized for low cost
- Low complexity
- Low Latency
- Wide Interoperability Infrastructure

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Sr.	Task	Deadline
1.	Download the SDK for WICED Sense, and get familiar with it	4 Days
2.	Go through different videos/documents related to WICED Sense and Display the WICED Sense data on the Desktop	4 Days
3.	Fetch the obtained data in the desktop to the online database	4 days

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Sr.	Task	Deadline
4.	Develop a notification system making use of the fetched values Eg: 1) If the temperature of the room falls below say 30 C, notify the user 2) If speed of the object crosses a specified threshold value, the object should stop. Can be done with Firebird V for testing	6 Days
5.	Using the sensor values, develop an effective algorithm for mapping of Firebird V robot inside specific area	10 Days
6.	Implementation and calibration	7 Days
7.	Design Tutorial and systematic Documentation of project.	3 Days

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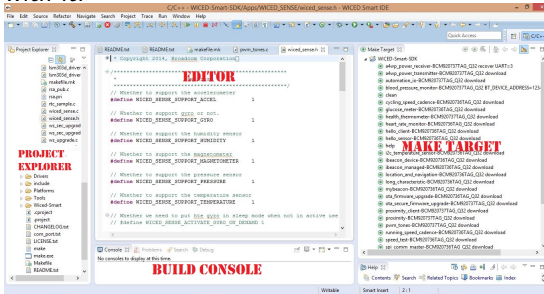
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- Downloading the SDK for WICEDSense, and getting familiar with it.



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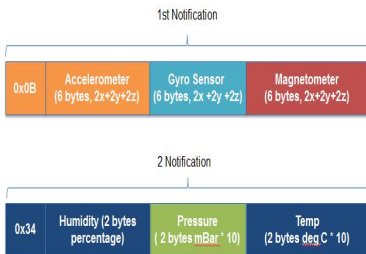
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Sensor Data Format



STM LPS25H	STM LPS25H – Pressure Sensor
STM LSM303D	STM LSM303D – Accelerometer and Magnetometer
STM L3GD20	STM L3GD20 – Gyroscope
STM LIS3DSH	STM LIS3DSH – Accelerometer
STM HTS221	STM HTS221 – Humidity and Temperature Sensor

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- Connecting Wiced-Sense to the system and getting the device data.

```
thang@khan-aspirom-355T: /usr/local/lib/node_modules/cylon-wiced-sense/examples/wiced-sense$ sudo node wiced-sense.js
2018-06-23T14:20:34.508Z : [Robot 1] - Starting connection.
2018-06-23T14:20:34.572Z : [Robot 1] - Starting connection 'bluetooth'.
2018-06-23T14:20:34.598Z : [Robot 1] - Starting device.
2018-06-23T14:20:34.597Z : [Robot 1] - Starting device 'battery'.
2018-06-23T14:20:34.597Z : [Robot 1] - Starting device 'deviceinfo'.
2018-06-23T14:20:34.597Z : [Robot 1] - Starting device 'generic'.
2018-06-23T14:20:34.597Z : [Robot 1] - Starting device 'wiced'.
2018-06-23T14:20:34.597Z : [Robot 1] - Working.
data: { description: 'Generic category', value: 'Generic Tag' }
data: { description: 'Generic category', value: 'Generic Tag' }
data: { accelerometer: { x: -83, y: -1, z: 0 },
  gyroscope: { x: -284, y: -893, z: 467 },
  magnetometer: { x: -877, y: -431, z: 358 } }
data: { accelerometer: { x: -83, y: -5, z: 5 },
  gyroscope: { x: 3579, y: -682, z: -686 },
  magnetometer: { x: -908, y: -436, z: 338 } }
data: { accelerometer: { x: -175, y: -8, z: 0 },
  gyroscope: { x: 3386, y: 229, z: 1852 },
  magnetometer: { x: -86, y: -436, z: 286 } }
data: { accelerometer: { x: -86, y: 4, z: -1 },
  gyroscope: { x: 3783, y: 244, z: 3378 },
  magnetometer: { x: -3954, y: -389, z: 233 } }
data: { accelerometer: { x: -82, y: 32, z: 5 },
  gyroscope: { x: -7075, y: 1583, z: 3272 },
  magnetometer: { x: -1088, y: 298, z: 106 } }
data: { accelerometer: { x: -77, y: 5, z: 2 },
  gyroscope: { x: 2289, y: 980, z: 2821 },
  magnetometer: { x: -1141, y: 235, z: 18 } }
data: { accelerometer: { x: -78, y: 6, z: 3 },
  gyroscope: { x: -383, y: 1193, z: 668 },
  magnetometer: { x: -1509, y: -102, z: -24 } }
data: { accelerometer: { x: -81, y: 12, z: 0 },
  gyroscope: { x: -1886, y: -228, z: -303 },
  magnetometer: { x: -1150, y: -378, z: -5 } }
data: { accelerometer: { x: -79, y: 32, z: 7 },
  gyroscope: { x: 36, y: 372, z: -353 },
  magnetometer: { x: -1047, y: -105, z: -15 } }
data: { humidity: 872, pressure: 9984, temperature: 329 }
data: { accelerometer: { x: -19, y: 8, z: 3 },
  gyroscope: { x: 141, y: -539, z: -276 },
  magnetometer: { x: -1125, y: -283, z: -16 } }
```

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- Converted the data into CSV format so that it can be easily extracted and inserted into mySQL database.

```
2016-06-30T04:12:54.792z : [Robot 1] - Starting connections.
2016-06-30T04:12:54.800z : [Robot 1] - Starting connection 'bluetooth'.
2016-06-30T04:12:54.835z : [Robot 1] - Starting devices.
2016-06-30T04:12:54.835z : [Robot 1] - Starting device 'wired'.
2016-06-30T04:12:54.835z : [Robot 1] - working.
one, two, three, four, five, six, seven, eight, nine, ten, eleven, twelve, thirteen
0, 0, 0, 0, 28, -54, 54, -176, 28, 44, -389, 827, -733 ]
0, 0, 0, 0, 28, -53, 54, -181, 183, 13, -374, 825, -721 ]
0, 0, 0, 0, 29, -53, 55, -299, -11, 97, -383, 825, -745 ]
0, 0, 0, 0, 29, -53, 55, -272, -65, 106, -379, 819, -733 ]
0, 0, 0, 0, 29, -52, 55, -248, -32, 91, -380, 813, -746 ]
0, 0, 0, 0, 28, -52, 56, -152, -1, 148, -380, 842, -745 ]
0, 0, 0, 0, 28, -52, 55, -123, 45, 145, -378, 819, -741 ]
0, 0, 0, 0, 28, -52, 56, -231, -165, 68, -392, 815, -737 ]
0, 0, 0, 0, 28, -52, 56, -216, -307, 46, -398, 819, -738 ]
0, 923, 9995, 297, 0, 0, 0, 0, 0, 0, 0, 0, 0 ]
0, 0, 0, 0, 29, -52, 56, -211, 35, 149, -389, 821, -748 ]
0, 0, 0, 0, 28, -51, 57, -289, -5, 65, -388, 814, -753 ]
0, 0, 0, 0, 28, -52, 56, -365, 87, 79, -387, 816, -740 ]
0, 0, 0, 0, 29, -52, 56, -170, 21, 34, -393, 833, -742 ]
0, 0, 0, 0, 29, -52, 56, -212, 28, 147, -393, 830, -744 ]
0, 0, 0, 0, 29, -53, 56, -247, 10, 169, -404, 820, -744 ]
0, 0, 0, 0, 28, -51, 55, -242, -47, 31, -397, 812, -738 ]
0, 0, 0, 0, 28, -51, 56, -256, 122, 87, -390, 825, -745 ]
0, 0, 0, 0, 29, -51, 57, -204, 124, 94, -389, 813, -735 ]
0, 923, 9991, 297, 0, 0, 0, 0, 0, 0, 0, 0 ]
0, 0, 0, 0, 29, -52, 57, -245, 25, 90, -408, 821, -751 ]
0, 0, 0, 0, 28, -51, 57, -170, -14, 102, -395, 816, -742 ]
0, 0, 0, 0, 28, -51, 56, -242, -28, 71, -391, 824, -738 ]
0, 0, 0, 0, 28, -52, 56, -198, 89, 79, -393, 809, -739 ]
0, 0, 0, 0, 28, -52, 55, -196, -41, 115, -390, 813, -755 ]
0, 0, 0, 0, 28, -51, 57, -217, 8, 46, -392, 824, -747 ]
0, 0, 0, 0, 29, -52, 56, -176, -93, 89, -384, 819, -747 ]
0, 0, 0, 0, 28, -52, 56, -195, 8, 108, -392, 812, -743 ]
0, 0, 0, 0, 28, -51, 56, -245, -62, 126, -384, 824, -748 ]
0, 923, 9993, 297, 0, 0, 0, 0, 0, 0, 0, 0 ]
0, 0, 0, 0, 29, -52, 58, 373, -852, -178, -406, 815, -759 ]
0, 0, 0, 0, 28, -52, 56, 679, -1308, -286, -382, 808, -881 ]
0, 0, 0, 0, 24, 53, 57, -241, 106, -118, -399, 799, -814 ]
0, 0, 0, 0, 20, -52, 57, -79, 623, -75, -393, 784, -816 ]
```

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- Data from the terminal is logged into csv file on the local system.

[illegible]

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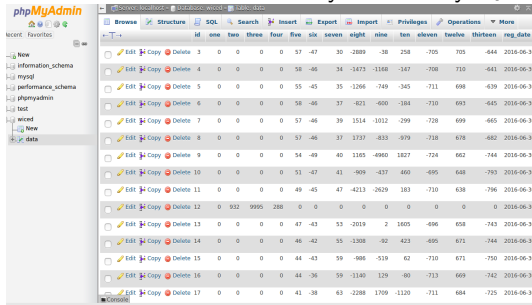
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- Pushed the data from local system to mySQL database.



	id	one	two	three	four	five	six	seven	eight	nine	ten	eleven	twelve	thirteen	reg_date
<input type="checkbox"/>	3	0	0	0	0	57	-47	30	-2889	-38	258	-705	705	-644	2016-06-31
<input type="checkbox"/>	4	0	0	0	0	58	-66	34	-1473	-1168	-147	-708	710	-641	2016-06-31
<input type="checkbox"/>	5	0	0	0	0	55	-45	35	-1266	-749	-345	-711	698	-639	2016-06-31
<input type="checkbox"/>	6	0	0	0	0	58	-66	37	-821	-600	-184	-710	693	-645	2016-06-31
<input type="checkbox"/>	7	0	0	0	0	57	-46	39	1514	-1012	-299	-728	699	-665	2016-06-31
<input type="checkbox"/>	8	0	0	0	0	57	-46	37	1737	-833	-979	-718	678	-682	2016-06-31
<input type="checkbox"/>	9	0	0	0	0	54	-49	40	1185	-4960	1827	-724	662	-744	2016-06-31
<input type="checkbox"/>	10	0	0	0	0	51	-47	41	-909	-437	460	-695	648	-793	2016-06-31
<input type="checkbox"/>	11	0	0	0	0	49	-45	47	-4213	-2629	183	-710	638	-796	2016-06-31
<input type="checkbox"/>	12	0	932	9995	288	0	0	0	0	0	0	0	0	0	2016-06-31
<input type="checkbox"/>	13	0	0	0	0	47	-43	53	-2019	2	1605	-496	608	-743	2016-06-31
<input type="checkbox"/>	14	0	0	0	0	46	-42	55	-1308	-92	423	-695	671	-744	2016-06-31
<input type="checkbox"/>	15	0	0	0	0	44	-43	59	-986	-519	62	-710	671	-750	2016-06-31
<input type="checkbox"/>	16	0	0	0	0	44	-36	59	-1140	129	-80	-713	669	-742	2016-06-31
<input type="checkbox"/>	17	0	0	0	0	41	-38	63	-2288	1709	-1120	-711	684	-725	2016-06-31

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- All the sensors data are fetched from the database and dynamically displayed on the webpage.

Working on..

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- Plotting graph/charts to display real time sensor data.
- Making GUI for different applications.

Challenges Faced

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- Installing Cylon js , Cylon-ble , Cylon-wiced-sense and all the other packages in ubuntu so that we acquire data from Wiced sense tag.
- Recovering firmware on wiced sense tag using wiced sdk.
- Pushing the data from local system to mySQL database.

Future Plans

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- To develop a notification system which will alert the user of a particular event.
- To develop an effective algorithm for mapping of Firebird V robot using the sensor data from wiced sense.

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- <https://cylonjs.com/documentation/platforms/wiced-sense/>
- <https://www.bluetooth.com/what-is-bluetooth-technology/bluetooth-technology-basics/low-energy>
- <http://stackoverflow.com/questions/tagged/javascript>

Thank You

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THANK YOU !!!