

## DPRG RBNV Chat Record – Oct 5, 2021

Carl Ott  
7:38 PM

~7:36 Ray discussing Binary Angle Measurement - a clever method to represent 360 rotational space with a fixed width binary number (the more bits -> the higher the resolution)

[https://en.wikipedia.org/wiki/Binary\\_angle\\_measurement](https://en.wikipedia.org/wiki/Binary_angle_measurement)

Carl Ott  
7:45 PM

~7:44 - Ray discussed various algorithms, including logic to calculate difference between two angles. ie. the minimum distance between two numbers.

Ted Meyers  
7:46 PM

I think you are making bam a lot more complicated than it is

Carl Ott  
7:49 PM

~7:48 - why bother to use this method? Ray explaining that it can help manage angle (e.g. heading) computations which go through the 0..360 degree transition ...

Carl Ott  
7:52 PM

~7:51 - Ted explained can be easy to think of as a unit conversion - like 8 bits - 360 divided by 256... And is all fixed point, hence you know what the errors are - and any way you do the math - with integers - is fast and you don't have to worry about funky corner cases

Carl Ott  
7:57 PM

~7:53 Scott- was show ongoing work on his BURP robot...

Carl Ott  
7:59 PM

will be a 4-wheel drive - not 3 wheel drive...

Carl Ott  
8:02 PM

\ chain drive – hardware from servo city... o hex shafts o bearings & chains o really nice stuff

Goals  lower the center of gravity / make it more stable  give it 4-wheel drive  give it a better sonar array (e.g. use LiDARs vs. Sonars  faster speed capability

Thalanayar Muthukumar  
8:07 PM

Is this burp? hearing about this for the first time

Ponder SomeMore  
8:08 PM

```
degreesToBAM(degrees, bits){ return degrees*180*2^-(bits-1); }
```

Carl Ott  
8:10 PM

~8:10 - Scott explaining the SparkFun LiDAR- showing 2D vs. 3D modes...

Carl Ott  
8:29 PM

~8:25 - discussion around 3D cameras / estimating objects and floors from scenes... point clouds and libraries...

You

8:30 PM

~8:30 - Kumar mentioned this library for airborne LiDARs <http://lastools.org/> - includes a function to return ground plane points...

Carl Ott

8:38 PM

~8:35 - Raj mentioned available methods to detect objects (e.g., using segmentation & deep learning...)

Carl Ott

8:43 PM

~8:41 - Ian - progress repurposing old RC car... Also - completed a RPi backup server - powered by a cute little 12V -> USB converter...

Carl Ott

8:49 PM

~8:47 - Pat -> mentioned - 2nd to 3rd October is latest to have an outdoor contest with hope of (non-snowshoe-based robot) participation from his area in Ontario

Carl Ott

8:50 PM

also showed his 20-year-old (~ year 2000) walking robot, using a Sharp digital sonar sensor, 2 servo based, Moto HC11 / assembler - forward / left / right with sonar

Carl Ott

8:53 PM

~8:51 - Glenn showed a similar 'bug-bot' with sonar sensor...

Carl Ott

9:02 PM

~9:01 - Doug P- various things - fun to do in a short period of time...

\$3.99 Pi Pico microcontroller at Microcenter...

Carl Ott

9:03 PM

DS28E18 - 1-wire to I2C bridge - new part from Maxim

Ray Casler

9:05 PM

What did Steven Hawkins use for text to speech?

Scott Gibson

9:05 PM

link for LiDAR camera. <https://www.sparkfun.com/products/18580>

Carl Ott

9:06 PM

Steven Hawkins used a custom modified TI Speak and Spell...

thanks Scott

Doug showed a good-looking resource on YouTube - "Murtaza's Workshop - Robotics and AI"

You

9:07 PM

e.g. Doug was working through this course

<https://www.youtube.com/channel/UCYUjYU5FveRAscQ8V21w81A>

see also the channel's website

<https://www.computervision.zone/course-list/>

some courses paid, some free...

Carl Ott

9:08 PM

~9:08 - Doug showed starship deliveries going on live at UTD - doing inter-building deliveries

Ray Casler

9:08 PM

Beer coolers??

Carl Ott

9:11 PM

~9:09 Doug showed YouTube - showing how to use a 3D Pen for practical purposes... e.g. making parts for structure and other pieces -

<https://www.youtube.com/watch?v=J3h7INVYL7E>

good example of technique

Carl Ott

9:13 PM

one example construction mat [https://smile.amazon.com/Printing-Silicone-Template-Drawing-MIKA3D/dp/B07GR55L1Y/ref=sr\\_1\\_1\\_sspa?dchild=1&keywords=3d+pen+mat+12.21+x+11.42&qid=1633486346&sr=8-1-](https://smile.amazon.com/Printing-Silicone-Template-Drawing-MIKA3D/dp/B07GR55L1Y/ref=sr_1_1_sspa?dchild=1&keywords=3d+pen+mat+12.21+x+11.42&qid=1633486346&sr=8-1-)

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[BENOYHO/dp/B08RC4RPBD/ref=sr\\_1\\_10?dchild=1&keywords=3d+pen+mat+12.21+x+11.42&qid=1633486390&sr=8-10](https://smile.amazon.com/Printing-Accessories-Template-Protectors-BENOYHO/dp/B08RC4RPBD/ref=sr_1_10?dchild=1&keywords=3d+pen+mat+12.21+x+11.42&qid=1633486390&sr=8-10)

Carl Ott

9:14 PM

~9:14 Doug - continued discussion on depth cameras

Thalanayar Muthukumar

9:15 PM

Is there a way post the meeting to view the chat with all links?

Carl Ott

9:18 PM

we haven't found a way to post chat time-tagged with the meeting video. it used to be - when we were able to use Google Meet to save the video stream - Google Meet would also capture the chat. But then we lost that feature (too expensive). So now - the best we've found, is to record the stream, and separately copy the chat with all the links - then post the chat in text form on [dprg.org](http://dprg.org) (e.g. video hosted on YouTube - but both video and chat are available on [dprg.org](http://dprg.org))

Thalanayar Muthukumar

9:18 PM

Thanks Carl

Chris N

9:20 PM

got to go... see you next week!

Thalanayar Muthukumar

9:29 PM

Need to go.

Carl Ott

9:32 PM

~9:31 - John G - showed progress converting his Halloween spider robot to brushless motors - stack of 12 custom motor driver boards with a considerable wiring harness prowess...

Ray Casler

9:34 PM

the details are left for the student to figure out.

ed mart

9:36 PM

Another spider leg design ..Watch "How Scuttle Walks" on YouTube [https://youtu.be/U8zYyy\\_4mZI](https://youtu.be/U8zYyy_4mZI)

Carl Ott

9:41 PM

~9:39 - John K showed some cute robots found on the

web... <https://www.youtube.com/watch?v=ZX17mcpGfp8>

and <https://www.youtube.com/watch?v=MEhJzbhxm8A>

available for preorder from Indiegogo <https://www.indiegogo.com/projects/bittle-a-palm-sized-robot-dog-for-stem-and-fun/x/14838942#/>

Carl Ott

9:47 PM

~9:47 - Raj - progress setting up new workstation...

pulled out 3d printer - getting workshop ready after landing in Dallas just 3 months ago

Ray Casler

9:48 PM

the man cave...

Pat Caron

9:54 PM

Thanks guys. See you on Saturday

Carl Ott

9:54 PM

John G- about your 2.5mm filament - perhaps - have you sent an offer 'free for take' to the DPRG D-List?

Or perhaps - post at [talk.dallasmakerspace.org](http://talk.dallasmakerspace.org) under the 'makertrade' section?

Carl Ott

10:14 PM

Discussion then continued on fabrication tools - 3D printers - etc...

Ponder SomeMore

10:39 PM

Ray, this is partially working - the model in excel works fine but something in the C translation isn't working in the DegreesToBAM function

```
#include <stdio.h> #include <math.h> float foo(int bits){ return pow((double)2,-((double)bits-1)); } float DegreesToBAM(int degrees, int bits){ return degrees/180/foo(bits); } float BAMToDegrees(int bam, int bits){ return bam*180*foo(bits); } int main() { printf("bam %f\n", DegreesToBAM(0,8)); printf("bam %f\n", DegreesToBAM(90,8)); printf("bam %f\n", DegreesToBAM(90+45,8)); printf("bam %f\n", DegreesToBAM(180,8)); printf("bam %f\n", DegreesToBAM(270,8)); printf(
```

also not optimized and throwing and it doesn't handle wrapping

Ponder SomeMore

10:40 PM

looks like there was a line limit and main got cut off

```
int main() { printf("bam %f\n", DegreesToBAM(0,8)); printf("bam %f\n", DegreesToBAM(90,8)); printf("bam %f\n", DegreesToBAM(90+45,8)); printf("bam %f\n", DegreesToBAM(180,8)); printf("bam %f\n", DegreesToBAM(270,8)); printf("bam %f\n", DegreesToBAM(360,8)); printf("bam %f\n", DegreesToBAM(360+180,8)); printf("deg %f\n", BAMToDegrees(0,8)); printf("deg %f\n", BAMToDegrees(64,8)); printf("deg %f\n", BAMToDegrees(128,8)); printf("deg %f\n", BAMToDegr
```

You

10:41 PM

Karim - yes - Google Meet is exceedingly annoying - imposes arbitrary limit on meaningful chat messages

Carl Ott

10:47 PM

code generator for STM32 <https://www.st.com/en/development-tools/stm32cubemx.html>

Carl Ott

10:49 PM

STM32 Cube - stand-alone code - can use as starting point for writing drivers