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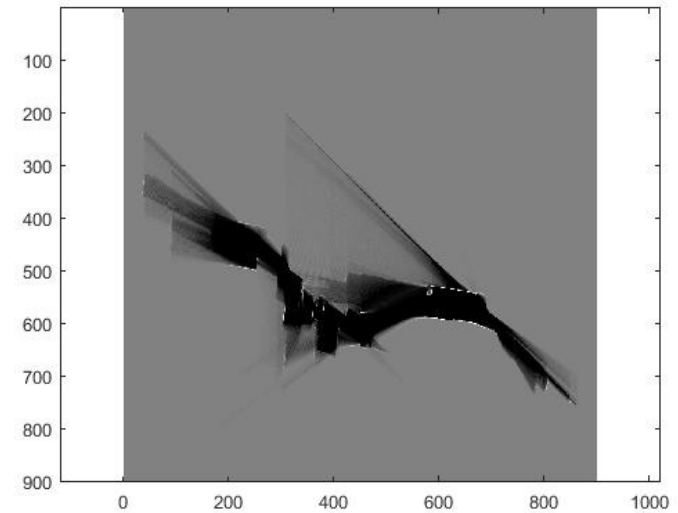
← Week 3

NK   **Assignment-3 Error. Anybody got test result to compare?**

Ng Beng Kiat Week 3 · 11 days ago

I'm able to run example_test but I'm not sure if result is right as I have error with runeval.m

Here's the plot for my example_test.

Can anybody verify if the grid map is correct?

Additionally, I have the following error from runeval.

Index exceeds matrix dimensions.

Error in occGridMapping (line 44)

myMap(occy,occx) = myMap(occy,occx)+lo_occ;

Seems like my occupancy index is out of range. But they were fine with the test example.

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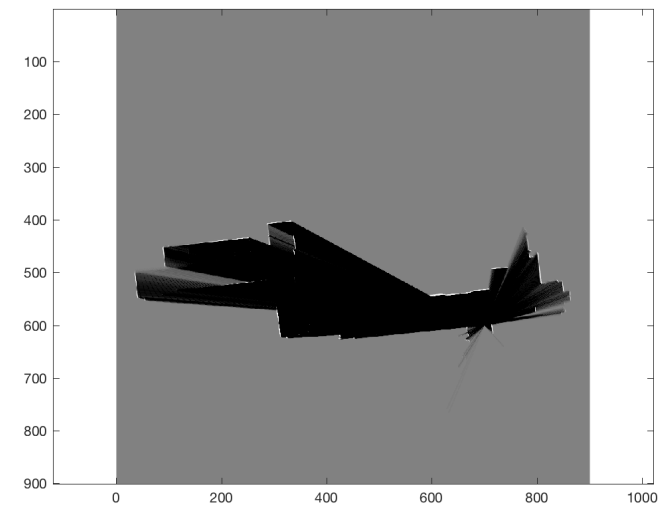
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Lea Kantor · 11 days ago · Edited

Hi,

I got a slightly different plot (more black pixels) and
runeval ran without problem.

What did you use for the inner loop range in
occGridMapping.m?

How did you set occx and occy?

BTW, did you manage to successfully complete Assignment2? Any hints?

Thanks.

👍 0 Upvote · Hide 11 Replies

NK   Ng Beng Kiat · 11 days ago · Edited

Hi Lea,

Forgot to mention that because the software is running slow, I use only half the lines in the range (i.e. 900). Maybe that's why your map is darker.

Do u have the same shape? (Sorry, now I see your plot).

Mine must be wrong as it's so different.

Now I modify the software to ignore those indices out of range and I manage to get the following plot. (I also use full scan now)
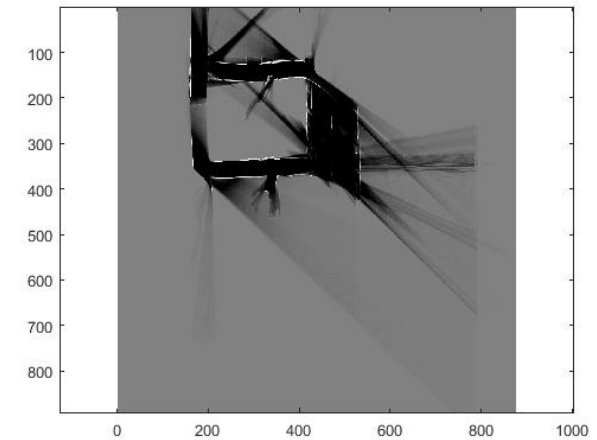
Unfortunately, I only get 7/15 for mapping1.
Get full score for mapping2.

There's a bug in my implementation.

As for assignment-2, I use the following process noise covariance.

Pnoise = [0.001 0 0 0;

0 0.001 0 0;

0 0 1 0;

0 0 0 1];

I manage to pass assignment-2.

👍 1 Upvote

Lea Kantor · 11 days ago · Edited   ⌄

It is weird. I use full range and my program does not run too slow. I added a plot in my message above. What plot Do you need?

In Assignment 2, did you change only the lines where vx, vy are computed? Did you use only the KF equations provided in the slides or implemented the full cycle from another resource?

👍 0 Upvote

NK

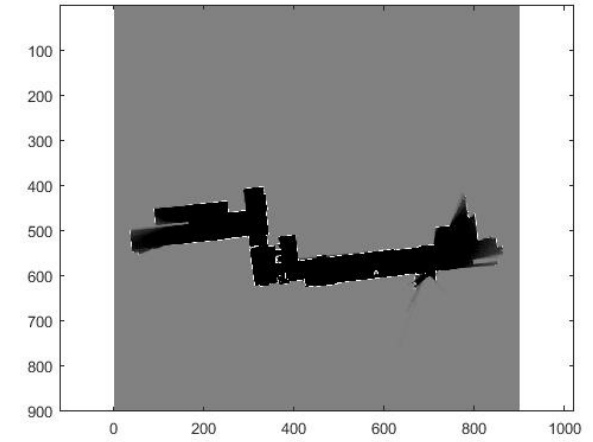Ng Beng Kiat · 11 days ago   ⌄

Hi Lea,

Thanks for your help. I'm not sure why your plot did not show initially but I manage to see it the second time round.
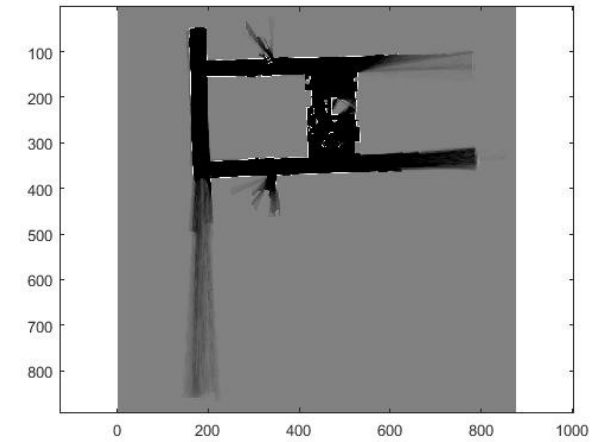
I manage to find my silly bug.

So here's the plot in case some others might find useful. The plot is slightly different from yours, Lea, but I think mine seems more correct.

Test plot

Evaluate plot

👍 2 Upvote

Lea Kantor · 11 days ago

Indeed yours looks better. I'll check it out. Thanks.

👍 0 Upvote

NK   **Ng Beng Kiat · 11 days ago**

Hi Lea,

Sorry that I missed the other part of your question.

Yes, I use the KF equation in the slide. It's abit confusing though but I have to reference some other sources just to be clear.

I studied KF before on my own but never really get the full picture as the maths are just too complicated.

I was hoping to learn UKF from this course, but...

👍 1 Upvote

Lea Kantor · 11 days ago · Edited

Hello again Ng Beng Kiat,

I managed to find my own silly yet creative bug. It turns out Bresenham didn't know his true origins. After fixing it I got the following plots, which are similar to yours:
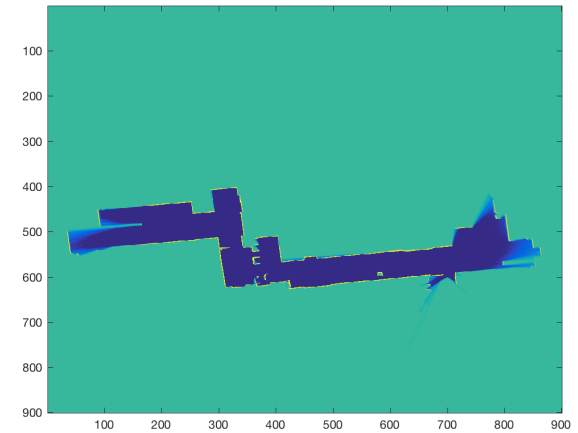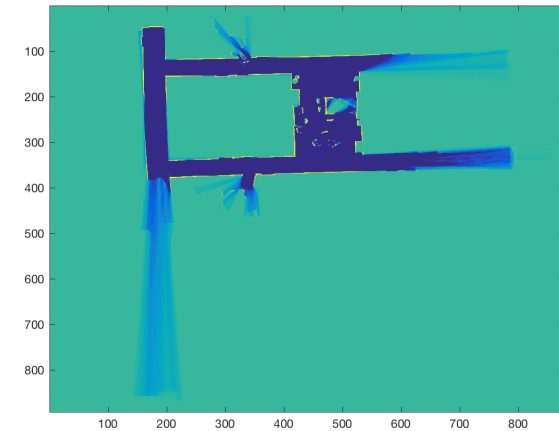
Thanks again for your tips.

👍 0 Upvote

SB

Soovadeep Bakshi · 10 days ago

Hello guys,

I seem to get the same result as shown above, but my submission does not match the requirements of the grader.

How do you get the evaluate plot?

Regards

👍 0 Upvote

Lea Kantor · 9 days ago

Add the following lines before the last end statement in **occGridMapping.m:**

```
figure,
imagesc(myMap);
saveas(gcf,'myMap.png');
```

The third line will save the map into a png file named 'myMap.png', so you can view.

👍 0 Upvote

罗育浩 · 8 days ago   ⌄

HI, Lea Kantor. I got the same result as you, but I got 15 score for mapping 2, howerver only 1 score for mapping 1. Did you got the full score?

👍 0 Upvote

Lea Kantor · 8 days ago   ⌄

Try saturating only the free and occupied cells for the specific round, inside the inner loop, instead of saturating the whole map outside the loops. This might solve the problem.

Weirdly enough, I got the full score even when I mistakenly input the wrong origins into the call to the bresenham function , as you can see

from the plot in my first message above.

👍 0 Upvote

罗   **罗育浩 · 8 days ago**   ⌄

May be the saturating matters, I try your idea
later.

👍 0 Upvote

SD | Reply |
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                                                    Reply

JC   **Jacky C.K. Chow · 9 days ago**   ⌄

What do you guys think about taking the union of the
occupied pixels and the union of the free pixels before
doing log-odd updates? Do you think that's more
conservative and make sense? Or if multiple lasers
falling on the same pixel (from the same pose) should
count that as multiple log-odd updates? Any insights?
Because if I don't do the union, pixels around the robot
gets really dark immediately.

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Lea Kantor · 9 days ago

Hi Jacky,

I'm not sure I understand your question, but isn't using the min and max values for saturating the Map pixels supposed to prevent that from happening?

👍 0 Upvote

Jacky C.K. Chow · 9 days ago

JC

Hi Lea,

Sorry for the confusion. I agree using min and max values takes care of that to some degree. But this is a slightly different problem I'm asking about, and I'm just curious I got the same answer as you guys and submitted my assignment already.

I just remember hearing from the lectures about taking the union of the free space pixels. Lets say we chose a coarse cell resolution, and 3 of our laser beams passed through that free cell. My question is do we treat that as 3 log-odd updates or just 1? I can come up with a reason to do both. In one case, because all 3 of your measurements are assumed to be independent, you are just 3 times as sure that it is a free cell from that single pose. Alternatively, you try to be more conservative,

and say "ok something did pass through that one cell, it is probably a free space but I'll be careful and only do the log-odd update once", now when I move to the next free space I can re-observe it again.

👍 0 Upvote

KC

Kun Cao · 8 days ago   ⌄

Hi, @Jacky, your question is very interesting. Here is some of my thoughts but I am not sure.

The angle between two consecutive laser beams is a constant , if the object stay too close to the origin of your beams, maybe a number of beams will detect the same cells as you have mentioned. Maybe this the reason why many depth camera has its desired detection distance or area. The official recommended distance for a kinect is 1220mm（4′）~3810mm(12.5′).

The precision of detection will change according to the distance from the object to the origin. (dis = 1m, pre~= 3mm;dis = 3m,pre ~=3cm) I guess the reason is that theta* dis get larger, kinect cannot tell the depth of the object between these two consecutive beams(because there is no laser at all).

These are some of my thoughts, correct me if I was wrong, thanks!

👍 0 Upvote

Bhoram Lee   Teaching Staff   · 5 days ago ⌄

Hi Jacky,

Thanks for sharing your thoughts. This is actually one of the frequently asked questions (in the offline class here). I suggest experimenting the two ideas by yourself: taking the union vs. treating measurement individually

It can depend on other parameters as well, but my guess is that not much difference will be seen, mainly because most cells are going to be observed many many times and be saturated pretty quickly anyway (unless the robot passes by very fast). You may choose based on your intuition or preference.

We tried to keep things simple (I mean the parameters), but there are actually many different ways to model the lidar measurement. For example, as Kun mentioned, it is known that the range accuracy gets worse when the range is large, thus you can model the log-odd update values as a function of range.

Hope you enjoyed this assignment!

👍 0 Upvote

SD

Reply

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JC   Jacky C.K. Chow · 8 days ago   ⌄

Hi Kun, for the Kinect I think the min distance is more of a function of the fixed based line and parallax angle. when too close the size of the projected infrared speckles is no ideal, plus you get little overlap and poorer geometry. But you made a good point there and it does answer part of the question, although I don't think it is the manufacturers intention. i know with Lidar manufacturers want a super small min measurable distance, it is just hard to do physically because of such strong signal being reflected. My previous pure curiosity question is independent of the sensor but more just about how you like to treat the probabilities in your map representation. And maybe there is no right or wrong answer.

👍 0 Upvote   ·   Reply

Dan Flath · 3 days ago   ⌄

Well - runeval took 5121.4765 seconds, over 85 minutes. My scores were part 1: 10/15 and part 2: 8/15. Are all your programs running this slow? I do not know what is being evaluated in the two parts, but it is hard to imagine how you can get both parts half right. Seems to me that either the program is just totally wrong OR it is basically perfect. Where is the middle ground? Suggestions of what I could check for?

👍 0 Upvote · Hide 2 Replies

WG
Winston Graham Gresov · a day ago

Hi @Dan:

I don't remember the exact run time for mine, but it was pretty close to 85 minutes. I'm using an old, slow P4 based computer. The time is spent in the free cell calculations - when I cut them out with a continue statement, it runs in 3 1/2 seconds.

The scores are simply proportional to the number of matches between estimated and correct values: occupied cells for part 1, free cells for part 2. So it's very easy to get some matches just by chance, especially in part 2, since most of the cells are free. My score for part 1 went from 3 to 15 when I reversed the x and y indexes, after noticing that my image was

reflected from images shown earlier in this post. My score for part 2 was 15 both before and after that change.

👍 0 Upvote

Dan Flath · a day ago ⌄

I sped my program up, too, switched the order of indices, and also made 2 little (but significant) fixes to stupid oversights and got up to the full 30/30. Run time for me is now about 30 seconds.

👍 0 Upvote

SD

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‹ 1 ›

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