SLAM 3D-Map Visualization in Broser

by nnn112358

My twitter name is @nnn112358

My ROS Japan User Group History (I have presentationed 2 times)

ROS Japan UG #10「OpenPose de ROS」

・・・Using OpenPose in ROS.

ROS Japan UG #11「シミュレーションでSLAMを試す」

・・・Try SLAM in my original simulation.

First, This URL Click

https://nnn112358.github.io/pages/potree-develop/examples/

You can also see this web site on mobile.
Today, My presentaion is how to make this page.

Abstoraction

1.”RtabMap “: 3D SLAM Software

Rtabmap is OSS 3D Slam Software using Kinect or other RGB-D Camera.

Rtabmap generates 3D Point Cloud Map.

2.”CloudCompare”:Data Editor

CloudCompare is Point Cloud Editor. You can correct if there is useless data.

3.”Potree”: 3D vitualization tool in broser

Potree is 3D Point Cloud Viewer tools in broser using javascript and webgl.

Potree is using octree database. This can reduce the data as well.

4.”GitPage”: Web service

GitPage is Github Webservice. GitPage can use javascript include potree.

RtabMap

RTAB-Map (Real-Time Appearance-Based Mapping)
is a RGB-D Graph-Based SLAM .

This Software won the ”IROS 2014 Kinect Challenge”.

Feature :

- The loop closure detector.
  When the same place is detected, it optimizes it retroactively to the past
- This software can be used stand-alone with a hand-held Kinect or RGBD Camera.
  Stand-alone is odometory Free.
- Of course, this corresponds to ROS

See below for details

http://introlab.github.io/rtabmap/

RtabMap Install

I confirmed environment：

-OS: Ubuntu1604 or Ubuntu1404

（You can use in the Mac or Windows without ROS）

-ROS: kinetic Kame or indigo

(I do not confirm others, probably it will work.)

-Device: Kinect V1

（I use freenect driver）

Install : We can install by just this.

ROS kinetic Kame:

```
$ sudo apt-get install ros-kinetic-freenect-launch
$ sudo apt-get install ros-kinetic-rtabmap-ros
```

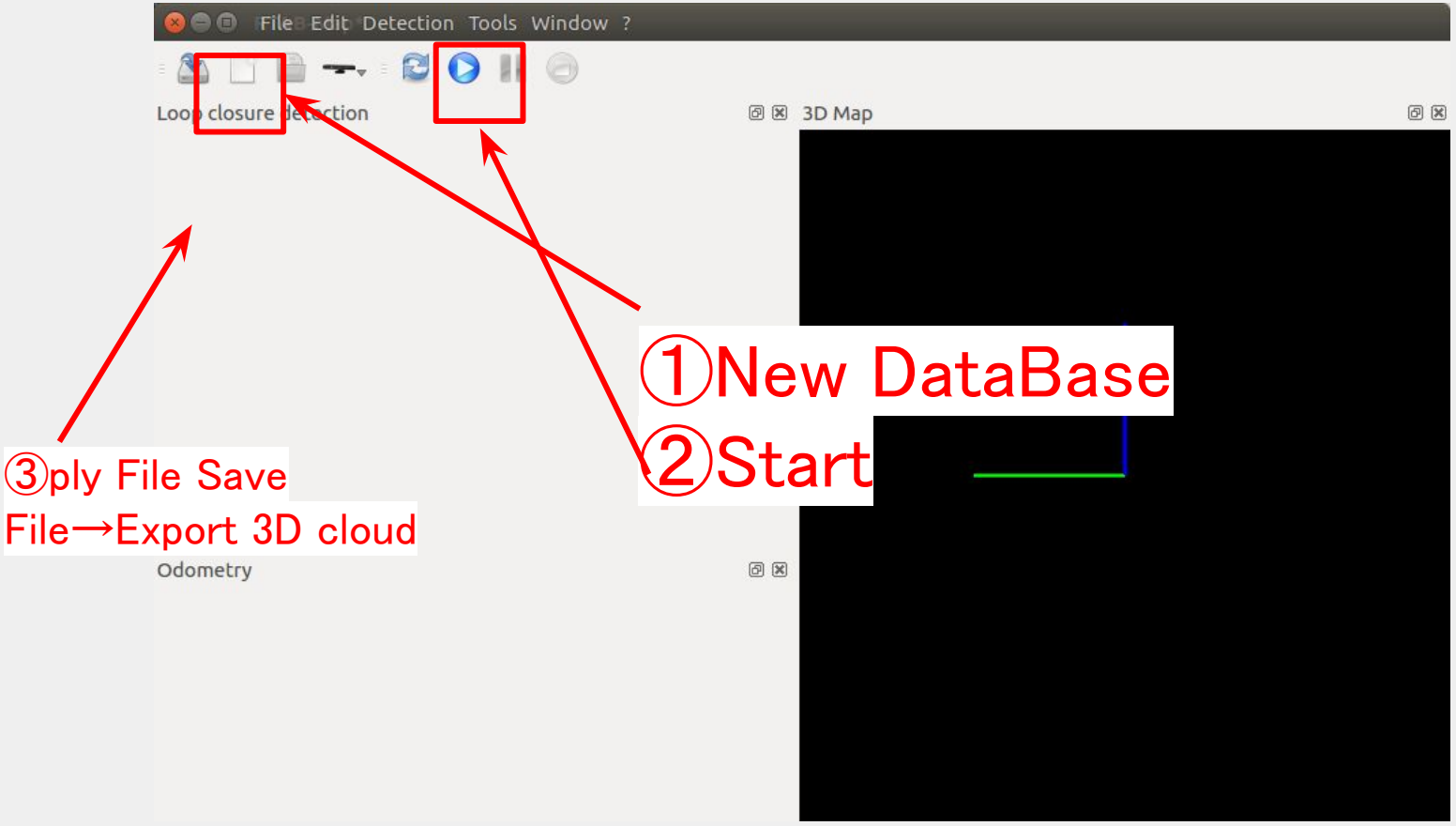
ROS indigo:

```
$ sudo apt-get install ros-indigo-freenect-launch
$ sudo apt-get install ros-indigo-rtabmap-ros
```

RtabMap Operation

It starts with this.

```
$ roslaunch freenect_launch freenect.launch  depth_registration:=true
$ roslaunch rtabmap_ros rgbd_mapping.launch
```



It looks difficults, but it's easy.

RtabMap Operation

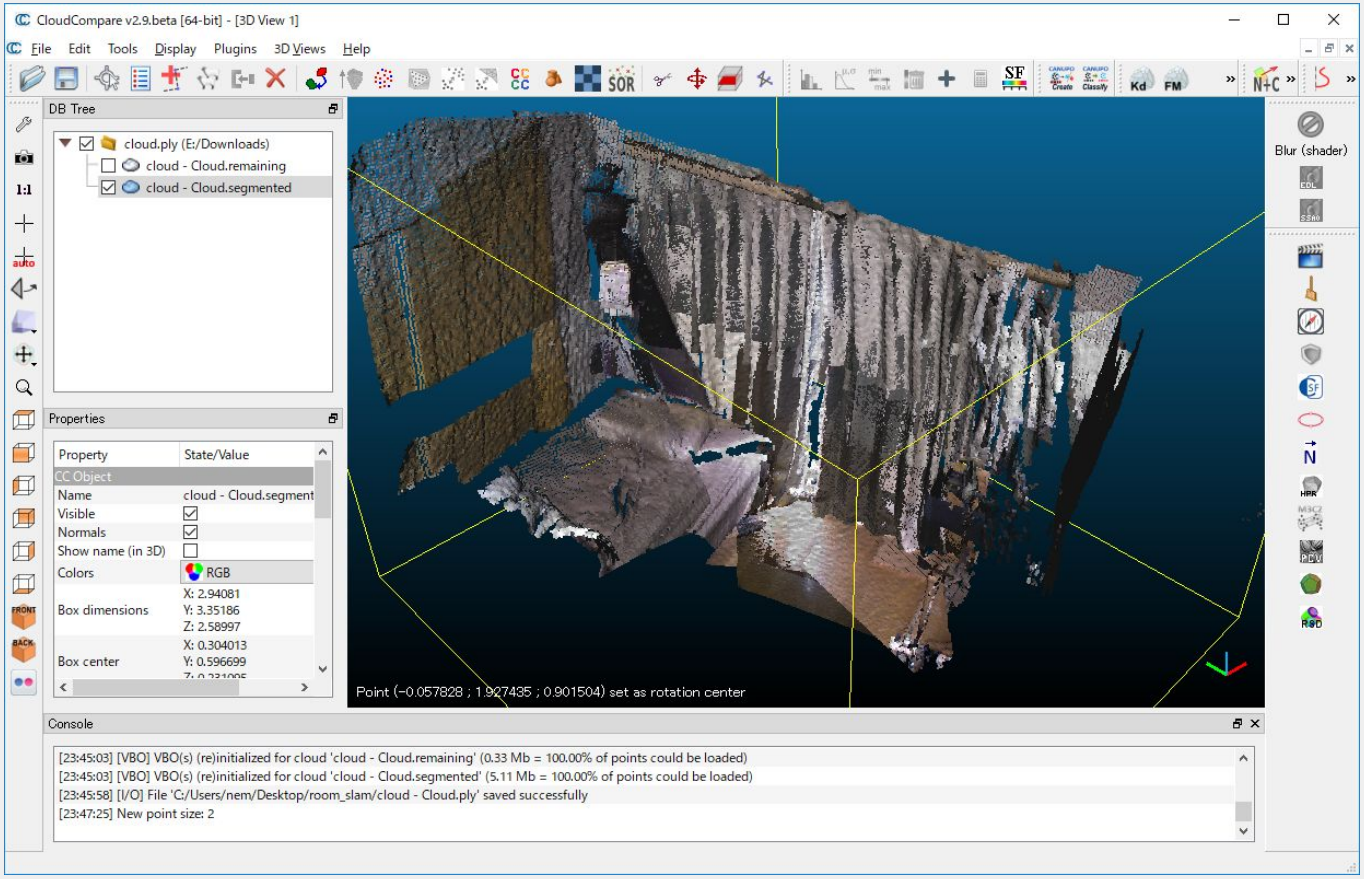
I prepared a video

I was worked in my room

CloudCompare

If you want to edit point cloud data, it is possible to use CloudCompare.
(you want to remove small garbage, you want to delete the ceiling)

CloudCompare http://www.danielgm.net/cc/



Potree

Potree is include two tools

-Potree

Potree is HTML and javascript files.

https://github.com/potree/potree

-Potree 1.3 Install

```
$ wget https://github.com/potree/potree/archive/1.3.zip
$ unzip potree-1.3.zip
```

-PotreeConverter

Builds a Potree file-format from 3D Point Cloud files.

https://github.com/potree/PotreeConverter

Potree

-PotreeConverter Install

Please execute this command

lastools

```
$ cd ~/dev/workspaces/lastools
$ git clone https://github.com/m-schuetz/LAStools.git master
$ cd master/LASzip
$ mkdir build
$ cd build
$ cmake -DCMAKE_BUILD_TYPE=Release ..
$ make
$ sudo make install
```

PotreeConverter

```
$ cd ~/dev/workspaces/PotreeConverter
$ git clone https://github.com/potree/PotreeConverter.git master
$ cd master
$ mkdir build
$ cd build
$ cmake -DCMAKE_BUILD_TYPE=Release -DLASZIP_INCLUDE_DIRS=~/dev/workspaces/lastools/master/LASzip/dll
        -DLASZIP_LIBRARY=~/dev/workspaces/lastools/master/LASzip/build/src/liblaszip.so ..
$ make
$ sudo make install
```

-PotreeConverter converts ply to potree.

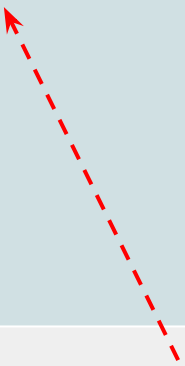
```
$ PotreeConverter cloud.ply -o /home/potree --generate-page pageName
```

Potree

-HTML File edit

```
$emacs ./potree-1.3/examples/lion.html
```

```
84  var sceneProperties = {
85   path:                  "../resources/pointclouds/pageName/cloud.js",
86   cameraPosition: null,
87   cameraTarget: null,
88   sizeType:              "Adaptive",
89   quality:          "Interpolation",
```

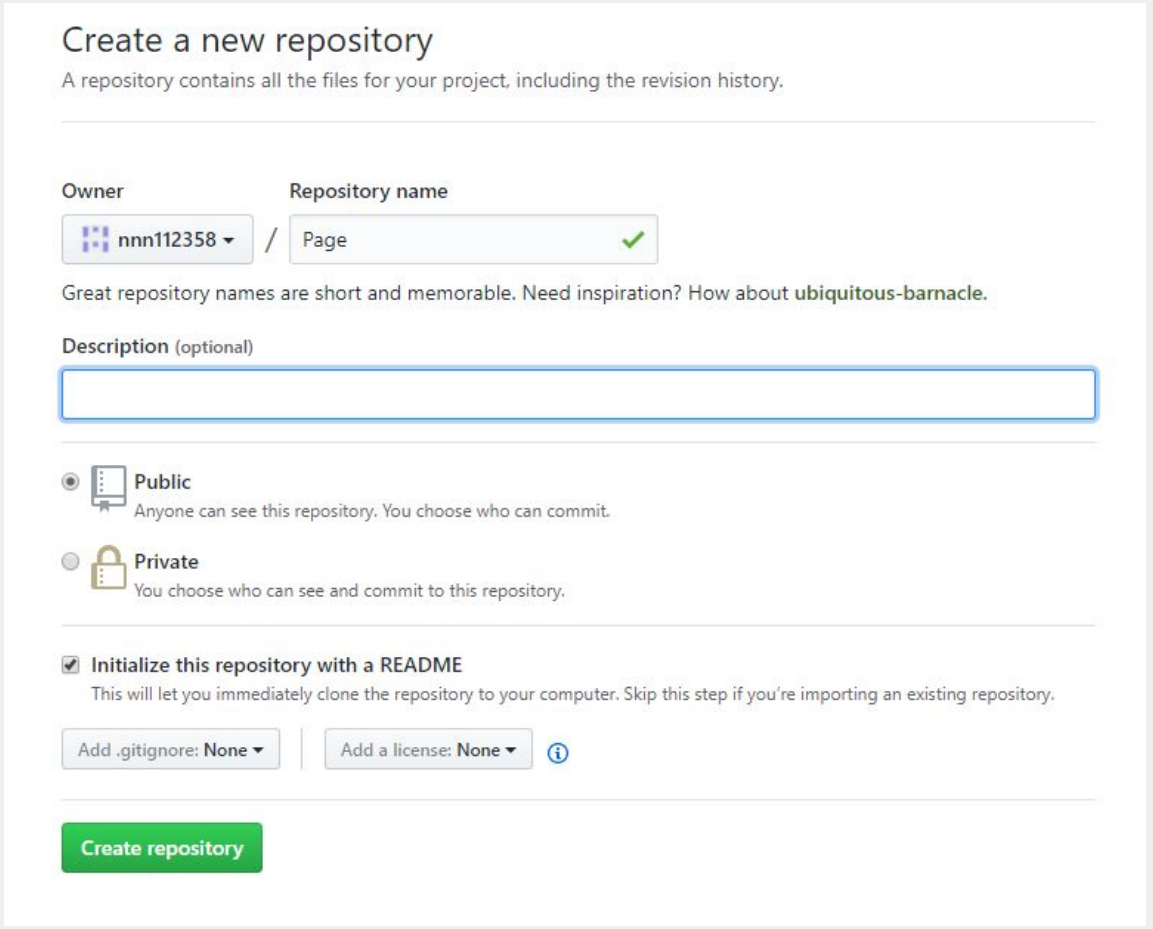


My File location

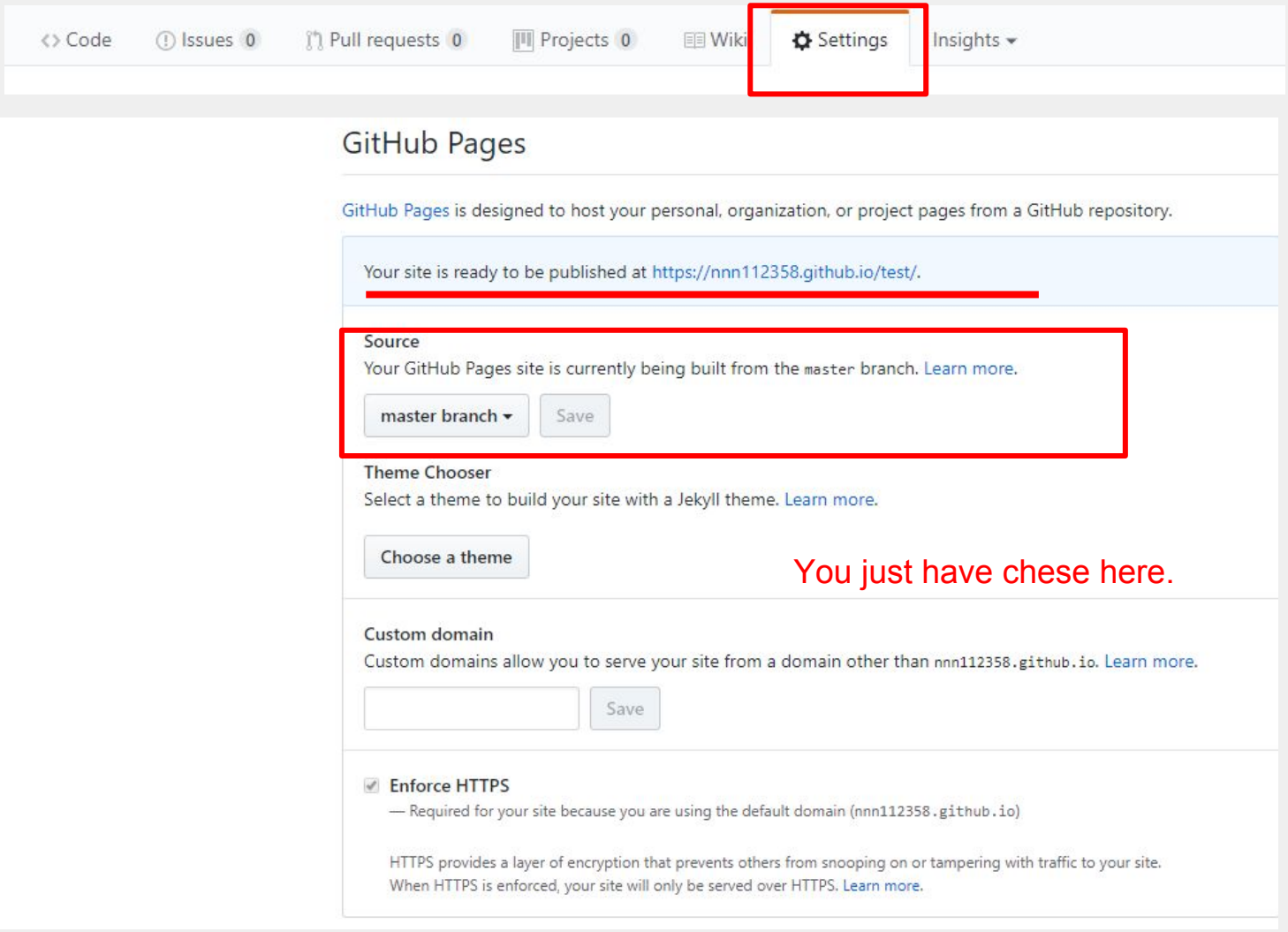
On the previous page,
What you wanted to put you here.

https://github.com/nnn112358/pages/tree/master/potree-develop

GitPage


Create a new repository
A repository contains all the files for your project, including the revision history.
Owner
Repository name
nnn112358
/
Page
Great repository names are short and memorable. Need inspiration? How about ubiquitous-barnacle.
Description (optional)
Public
Anyone can see this repository. You choose who can commit.
Private
You choose who can see and commit to this repository.
Initialize this repository with a README
This will let you immediately clone the repository to your computer. Skip this step if you're importing an existing repository.
Add .gitignore: None
Add a license: None
Create repository

GitPage


Code
Issues 0
Pull requests 0
Projects 0
Wiki
Settings
Insights
GitHub Pages
GitHub Pages is designed to host your personal, organization, or project pages from a GitHub repository.
Your site is ready to be published at https://nnn112358.github.io/test/.
Source
Your GitHub Pages site is currently being built from the master branch. Learn more.
master branch
Save
Theme Chooser
Select a theme to build your site with a Jekyll theme. Learn more.
Choose a theme
You just have chese here.
Custom domain
Custom domains allow you to serve your site from a domain other than nnn112358.github.io. Learn more.
Save
Enforce HTTPS
— Required for your site because you are using the default domain (nnn112358.github.io)
HTTPS provides a layer of encryption that prevents others from snooping on or tampering with traffic to your site.
When HTTPS is enforced, your site will only be served over HTTPS. Learn more.

Conclusion

SLAM 3D-Map Visualization in Broser

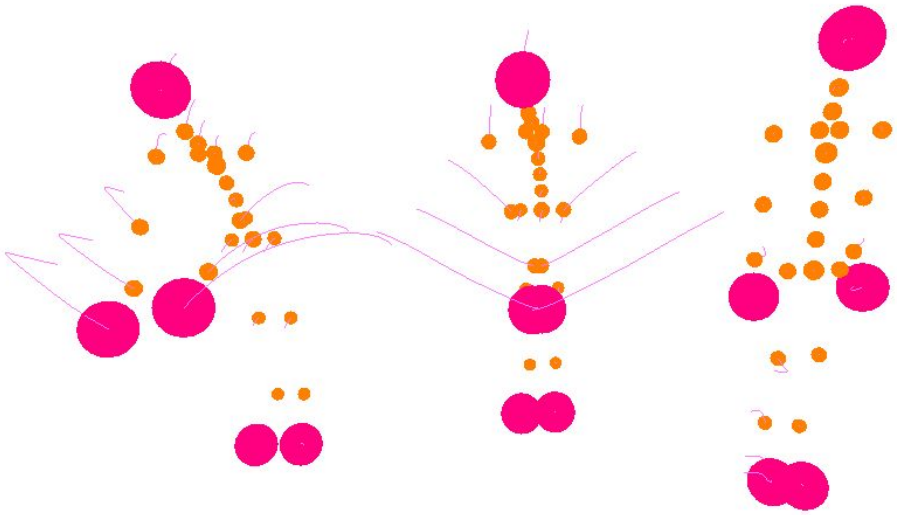
=

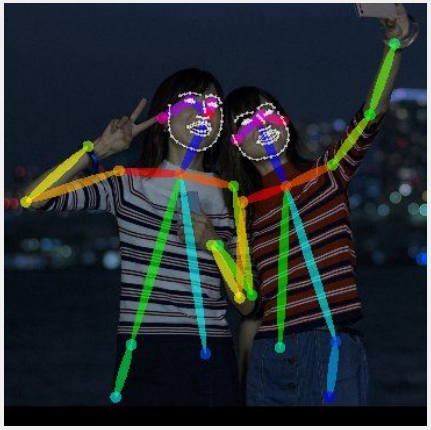
RtabMap+CloudCompare+Potree+GitPage

Let's try a tools ,

and make a cool visualization !!

Thank you for listening.





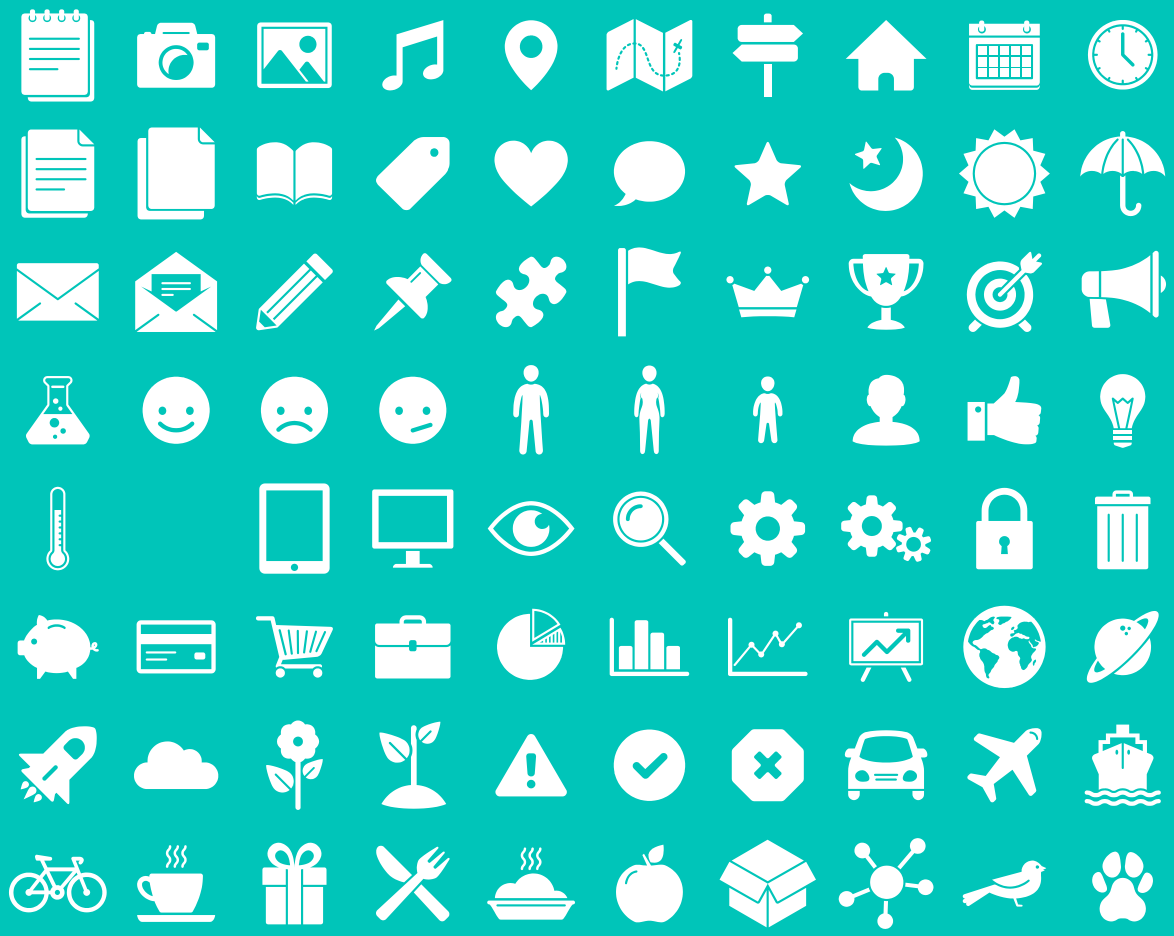
I am @nnn112358

History
- ROS Japan UG #10「OpenPose de ROS」
- ROS Japan UG #11「シミュレーションでSLAMを試す」

Recently ,I made Maker's Commminuty "Ano Lab"
with my friends.

We want to make amazing robots,
and surprise everyone.
Follow me on Twitter , and wait for completion !!

@anoken2017



SlidesCarnival icons are editable shapes.

This means that you can:

- Resize them without losing quality.
- Change fill color and opacity.
- Change line color, width and style.

Isn’t that nice? :)

Examples: