Slam Final Project

A repo for the final project of SLAM study by **Dr.Gao Xiang**.
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Project Structure

- **SlamWork**: Body class of all the features. It contains the following classes.
- **DepthGenerator**: Generate the depth from stereo images.
- **OrbMatcher**: Match the neighbor frames.
- **IcpTranslator**: Generate the R and T between neighbor poses.

Sample

sample_00 is a sample short cut from the datasets of **kitti** ordometry sequence 00.

final_project.cc supplies a sample of this **SlamWork** implement.

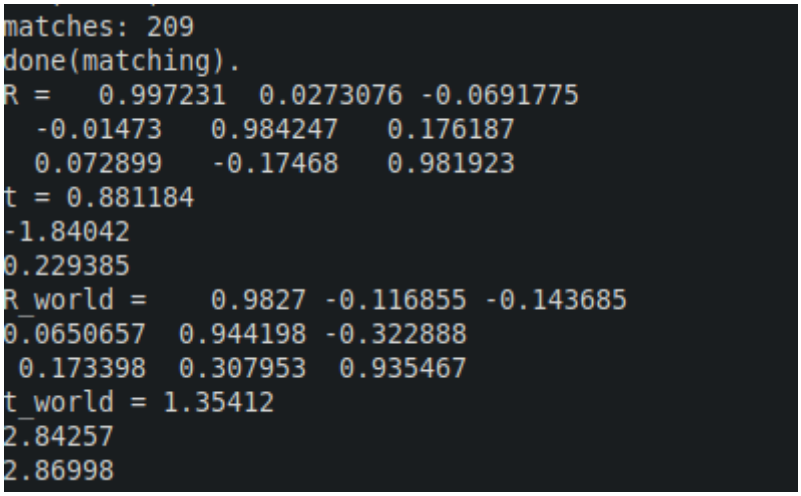
```
#include "slam_work.h"

int main(int argc, char** argv) {
    std::cout << "Please input like this: /path/to/kitti/sequence/ fx fy cx cy
baseline number_of_frames"<< std::endl;
    SlamWork slam_work;
    std::string fx(*(argv+2)),fy(*(argv+3)),cx(*(argv+4)),cy(*
(argv+5)),baseline(*(argv+6));
    std::cout << "fx = " << std::stof(fx) << std::endl;
    std::cout << "fy = " << std::stof(fy) << std::endl;
    std::cout << "cx = " << std::stof(cx) << std::endl;
    std::cout << "cy = " << std::stof(cy) << std::endl;
    std::cout << "stereo baseline = " << std::stof(baseline) << std::endl;
    slam_work.SetParams(std::stof(fx), std::stof(fy), std::stof(cx),
std::stof(cy),std::stof(baseline));// 718.856, 718.856, 607.1928, 185.2157,
0.537166 // Input manually.
    std::string in_path = *(argv+1);
    slam_work.input_path_ = in_path;
    std::cout << "kitti dir = " << slam_work.input_path_ << std::endl;
    std::string num_frames(*(argv+7));
    slam_work.pose_number_ = std::stoi(num_frames);
    std::cout << "number of frames = " << slam_work.pose_number_  << std::endl;
    slam_work.R_world_ << 1,0,0,0,1,0,0,0,1;
    slam_work.t_world_ << 0,0,0;
    slam_work.ComputePose();
    return 0;
}
```

Run the Demo

The arguments are: **input_path fx fy cx cy baseline number_of_frames**
Use the following commands to build & run the **final_project**.

```
mkdir build
cd build
cmake ..
make
./final_project ../sample_00/ 718.856 718.856 607.1928 185.2157 0.537166 10
```

Result



Output now are the infos printed at the console.

R_world: The R matrix from the present to the first.

t_world: The t vector from the present to the first.

Problems & Future work

It seems that the ICP result is not so stable. And the BA and other backend functions have not been established.
I will study the codes in **slambook2/ch13** which clearly implemented a good example of stereo slam of kitti.
Thanks again for dear teachers **Dr.Gao Xiang** and **Mr.Xiao**.