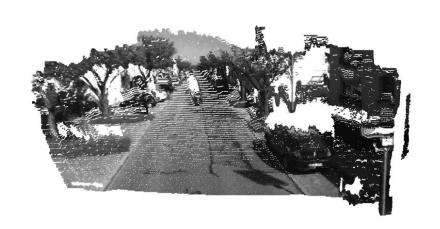
2. 图像去畸变



可执行文件: code/build/undistorted

3. 双目视差使用



可执行文件: code/build/disparity

4. 矩阵微分

4. (1).
$$d(Ax)/dx$$

= $A A$.

 $d(x^TAx)/dx = (A+A^T)x.$

(3). Let
$$x = \{x_1, x_2, ..., x_n\}^T$$
. and $A = \{aij\}_{n \times n}$.

$$x^T A x = \sum_{i=1}^n \sum_{k=1}^n (x_k a_{ik}) x_i$$
and if the element of $A x x^T$ is:
$$\sum_{k=1}^n (a_{ik} x_k) \cdot x_j = \sum_{k=1}^n (x_k a_{ik}) x_j$$
Then trace of $A x x^T$ means:
$$A x x^T = \sum_{i=1}^n (A x x^T)_{ii} = \sum_{i=1}^n \sum_{k=1}^n (a_{ik} x_k) a_i = \sum_{i=1}^n \sum_{k=1}^n (A x_k a_{ik}) x_i$$

$$= x^T A x.$$

5. 高斯牛顿法

```
dongqxia@DellMorty:/media/dongqxia/新加卷/SLAM/HW/HW4/code/build - - [14:43:20]
$ ./GN
total cost: 3.19575e+06
total cost: 35673.6
total cost: 2195.01
total cost: 174.853
total cost: 102.78
total cost: 101.937
total cost: 101.937
total cost: 101.937
cost: 101.937, last cost: 101.937
estimated abc = 0.890912, 2.1719, 0.943629
```

加入对 dx 的判断条件,在没有大幅提升的情况下(认为陷入 local minimum 附近),break

```
🛭 🖨 🕕 🏻 Terminal
dongqxia@DellMorty:/media/dongqxia/新加卷/SLAM/HW/HW4/code
$ cd build
dongqxia@DellMorty:/media/dongqxia/新加卷/SLAM/HW/HW4/code/build - - [
$ make
[ 33%] Built target undistorted
[ 66%] Built target disparity
Scanning dependencies of target GN
[ 83%] Building CXX object CMakeFiles/GN.dir/gaussnewton.cpp.o
[100%] Linking CXX executable GN
[100%] Built target GN
dongqxia@DellMorty:/media/dongqxia/新加卷/SLAM/HW/HW4/code/build - - [19:
$ ./GN
total cost: 3.19575e+06
total cost: 376785
total cost: 35673.6
total cost: 2195.01
total cost: 174.853
total cost: 102.78
Not much improvement. Stop here.
estimated abc = 0.892079, 2.16994, 0.944438
dongqxia@DellMorty:/media/dongqxia/新加卷/SLAM/HW/HW4/code/build
$ [
```

可执行文件: code/build/GN