visual navigation exercise 02

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May 2019

1 Exercise 2

1.1 What is the difference between these curve fitting examples?

The difference between curve fitting and robust curve fitting is that robust curve fitting can fix outlier data by using a loss function. The loss function is zero when residual is zero. It can reduce the influence of residual blocks that have high residual. The common loss functions are CauchyLoss, TrivialLoss, HuberLoss and so on.

2 Exercise 3

2.1 What are the command line parameters that it uses?

The command line uses –show-gui, –dataset-path, –cam-model as parameters. –show-gui parameter is a boolean value indicating whether to open a gui for camera calibration. –dataset-path parameter is a string value indicating the path of data. –cam-model parameter is a string value indicating the camera model type.

2.2 Summary and analysis of calibration result

We can use Cost as the quantitative measurement of how well camera model can fit the data collected. The value of Cost after optimization of every camera is shown below:
The cost of double sphere camera after optimization is 1.627482e+02
The cost of Kannala Brandt camera after optimization is 1.619844e+02
The cost of pinhole camera after optimization is 1.565735e+05
The cost of extended unified camera after optimization is 1.627604e+02
We can see from the above result that Kannala Brandt Camera is the one which fits the data best. At the same time, pinhole camera is the one which fits data the worse.