for (int i = 1; i < imudata.size(); ++i) {

/// imu 动力学模型 欧拉积分

/\*MotionData imupose= imudata[i];

//delta\_q = [1 , 1/2 \* thetax , 1/2 \* theta\_y, 1/2 \* theta\_z]

Eigen::Quaterniond dq;

Eigen::Vector3d dtheta\_half = imupose.imu\_gyro \* dt /2.0;//理想数据，没减去bias

dq.w() = 1;

dq.x() = dtheta\_half.x();

dq.y() = dtheta\_half.y();

dq.z() = dtheta\_half.z();

Eigen::Vector3d acc\_w = Qwb \* (imupose.imu\_acc) + gw; // aw = Rwb \* ( acc\_body - acc\_bias ) + gw

Qwb = Qwb \* dq;

Vw = Vw + acc\_w \* dt;

Pwb = Pwb + Vw \* dt + 0.5 \* dt \* dt \* acc\_w;\*/

/// 中值积分 作业题目

MotionData imupose\_0= imudata[i-1];

Eigen::Quaterniond dq;

Eigen::Vector3d dtheta\_half\_0 = imupose\_0.imu\_gyro \* dt /2.0;

MotionData imupose\_1 = imudata[i];

Eigen::Vector3d dtheta\_half\_1 = imupose\_1.imu\_gyro \* dt /2.0;

Eigen::Vector3d dtheta\_half = 0.5\*(dtheta\_half\_0+dtheta\_half\_1);

dq.w() = 1;

dq.x() = dtheta\_half.x();

dq.y() = dtheta\_half.y();

dq.z() = dtheta\_half.z();

Eigen::Vector3d acc\_w\_0=Qwb \* (imupose\_0.imu\_acc)+gw;

Qwb= Qwb \* dq;

Eigen::Vector3d acc\_w\_1=Qwb \* (imupose\_1.imu\_acc)+gw;

Eigen::Vector3d acc\_w=0.5\*(acc\_w\_0+acc\_w\_1);

Vw = Vw + acc\_w \* dt;

Pwb = Pwb + Vw \* dt + 0.5 \* dt \* dt \* acc\_w;

//　按着imu postion, imu quaternion , cam postion, cam quaternion 的格式存储，由于没有cam，所以imu存了两次

save\_points<<imupose\_1.timestamp<<" "

<<Qwb.w()<<" "

<<Qwb.x()<<" "

<<Qwb.y()<<" "

<<Qwb.z()<<" "

<<Pwb(0)<<" "

<<Pwb(1)<<" "

<<Pwb(2)<<" "

<<Qwb.w()<<" "

<<Qwb.x()<<" "

<<Qwb.y()<<" "

<<Qwb.z()<<" "

<<Pwb(0)<<" "

<<Pwb(1)<<" "

<<Pwb(2)<<" "

<<std::endl;

}

clear

close all

A = dlmread('/home/lyy/000slam\_vio/2/catkin\_imu\_utils/src/imu\_utils/data/data\_A3\_acc\_t.txt');

data\_x = dlmread('/home/lyy/000slam\_vio/2/catkin\_imu\_utils/src/imu\_utils/data/data\_A3\_acc\_x.txt');

data\_y= dlmread('/home/lyy/000slam\_vio/2/catkin\_imu\_utils/src/imu\_utils/data/data\_A3\_acc\_y.txt');

data\_z = dlmread('/home/lyy/000slam\_vio/2/catkin\_imu\_utils/src/imu\_utils/data/data\_A3\_acc\_z.txt');

B=[data\_x data\_y data\_z] ;

AA= dlmread('/home/lyy/000slam\_vio/2/catkin\_imu\_utils/src/imu\_utils/data/data\_A3\_acc\_t.txt');

data\_sim\_x= dlmread('/home/lyy/000slam\_vio/2/catkin\_imu\_utils/src/imu\_utils/data/data\_A3\_sim\_acc\_x.txt');

data\_sim\_y= dlmread('/home/lyy/000slam\_vio/2/catkin\_imu\_utils/src/imu\_utils/data/data\_A3\_sim\_acc\_y.txt');

data\_sim\_z= dlmread('/home/lyy/000slam\_vio/2/catkin\_imu\_utils/src/imu\_utils/data/data\_A3\_sim\_acc\_z.txt');

data\_sim\_draw=[data\_sim\_x data\_sim\_y data\_sim\_z] ;

figure

loglog(A, B,'o');

hold on;

xlabel('time: sec');

%ylabel('Sigma:deg/h');

ylabel('gyr: rad/s');

legend('X ','Y ','Z ');

loglog(A, data\_sim\_draw , '-');

%grid on;

%hold on;

%loglog(A, data\_sim\_draw,'-' );

%legend('X-sim ','Y-sim ','Z-sim ');

%%%%%%%%%%%%%%%%