Contents

1 Introduction

2 Theoretical Background

2.1 localization with distances

2.2 distance measurements base on UWB signal

2.3 KF

2.4 EKF

2.5 Self-Calibrations for Anchor-Nodes

3 State of the Art

4 Measurements

4.1 Measurements Environments

4.1.1 Calibration Setup

4.1.2 Data Collections Setup

4.2 Measurements Results

4.2.1 Measurements Distributions

4.2.2 Calibration results

5 Experiments Base on Simulations data

5.1 generating moving trajectories

5.2 choosing Positions of Anchor-Nodes

5.3 EKF without noisy distance data

5.3.1 choosing the right parameter for EKF

5.3.2 different strategies of processing incoming data

5.3.2.1 evenly distributed sampling in time domain

5.3.2.2 uneven distributed sampling in time domain

5.3.3 Results

5.4 EKF with noisy distance data

5.4.1 choosing the right parameter for EKF

5.4.2 Results

5.5 Self-Calibrations for Anchor-Nodes

5.5.1 performance effected factors

5.5.1.1 number of trajectory points and Anchor-Nodes

5.5.1.2 distributions of the Anchor-Nodes and the trajectory

6 Experiments Base on Measurements data

6.1 EKF with Measurements data

6.1.1 choosing the right parameter for EKF

6.1.2 Results

6.2 Self-Calibrations for Anchor-Nodes

6.2.1 Results