

Improving 2D SLAM results on uneven terrain by utilizing inertial sensor data

Okke Formsma
University of Amsterdam

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Abstract

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Chapter 1

Introduction

Explains why this research is interesting.

The Simultaneous Localization And Mapping (SLAM) method employed by the AJORF (Amsterdam-Oxford Joint Rescue Forces [\[cite team description paper\]](#) is not robust against severe tilting of the laser scanner.

In this report, an extension to the algorithm is proposed which prevents the addition of patches to the map when the laser scanner data is in a plane too far from the horizontal

Chapter 2

Background

2.1 USAR Sim

* The Urban search and rescue challenge

2.2 Slam

SLAMMERDELSAM

Chapter 3

Method

3.1 SLAM confidence measure

The confidence measure based on the determinant of the covariance matrix of the pose uncertainty. The hypothesis is that if this measure is larger, then the confidence is lower (the uncertainty is bigger).

The determinant of the covariance matrix is used as metric:

is the sample variance-covariance matrix for observations of a multivariate vector of p elements. The determinant of D , in this case, is sometimes called the generalized variance. (<http://www.itl.nist.gov/div898/handbook/pmc/section5/pmc532.htm>)

3.2 Inertial sensor data

Gives the rotations on three axis, enables you to detect