



TECHNICAL UNIVERSITY OF MUNICH

DEPARTMENT OF INFORMATICS

Master's Thesis in Informatics

# **Vehicle Localization and Tracking for Collision Avoidance System**

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# **Vehicle Localization and Tracking for Collision Avoidance System**

## **Fahrzeuglokalisierung und -verfolgung für das Kollisionsvermeidungssystem**

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I confirm that this master's thesis is my own work and I have documented all sources and material used.

Ich versichere, dass ich diese Master's Thesis selbständig verfasst und nur die angegebenen Quellen und Hilfsmittel verwendet habe.

Munich, 01.01.2020

Behtarin Ferdousi

## Acknowledgments

Yet to be written

# Abstract

This is the abstract. It is a short summary of your work, consisting of roughly one to three paragraphs. It should give the main ideas of your paper, i.e., the posed problem, a motivation for solving it, your solution method, and your results. Keep it understandable for a general audience. Do not include references.

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# 1 Introduction

- Motivation
- Problem Formulation
- State of the art solutions
- Structure of the paper

## 2 Problem Formulation

Consider the following system:

$$\begin{aligned}x_{k+1} &= Ax_k + Ew_k \\ y_k &= Cx_k + Fv_k\end{aligned}\tag{2.1}$$



## **3 Methodologies**

### **3.1 Kalman Filter**

### **3.2 Segment Minimization**

### **3.3 Volume Minimization**

### **3.4 $H-\infty$ Approximation**

## 4 Result

- Efficiency
  - Accuracy
  - Performance Metric
- h-infinity-approximation

## 4 Result

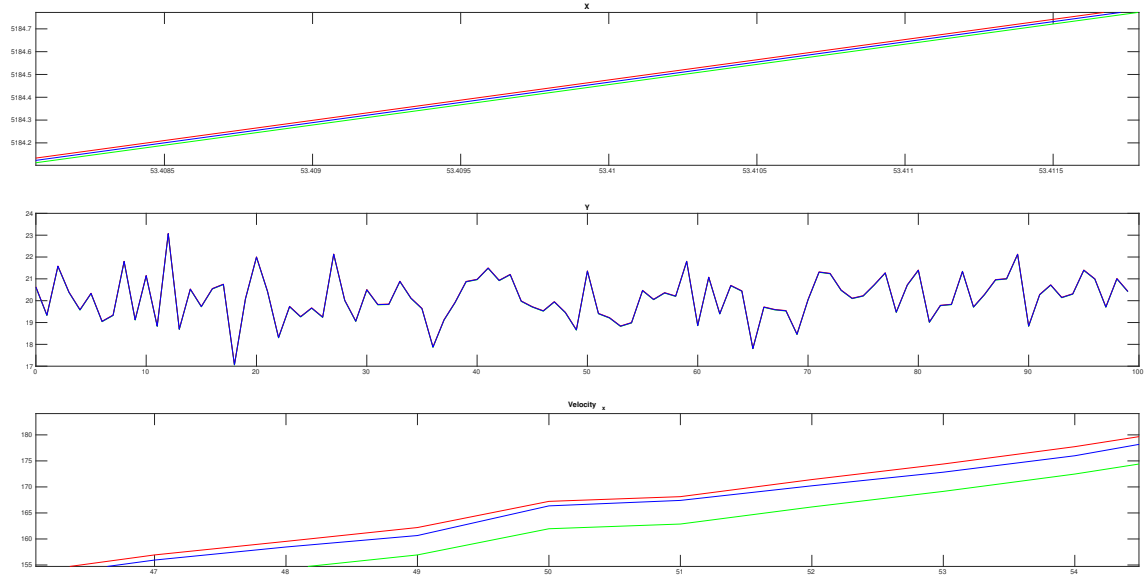


Figure 4.1: Predicting velocity from and x and y with segment minimization

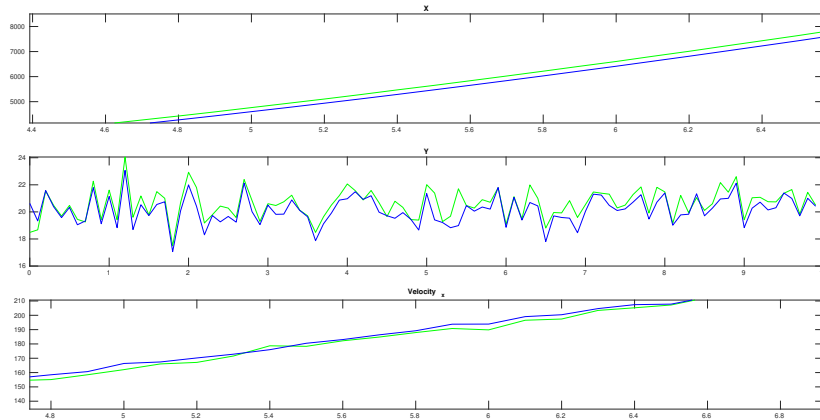


Figure 4.2: Predicting velocity from and x and y with  $H_\infty$

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