

**Höhere Technische Bundeslehranstalt Kaindorf an der Sulm**  
**Abteilung Informatik**

**Diplomarbeit**  
im Rahmen der Reife- und Diplomprüfung

# Königskarte



informatik

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5BHIF  
2024/2025

Betreuer: Prof. DI Johannes Loibner, BSc  
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Datum: MISSING DATE

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## Statutory declaration

I declare under oath that I have written the present diploma thesis independently and without outside help, have not used sources and aids other than those indicated and have identified the passages taken from the sources used literally and in terms of content as such.

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Ort, Datum

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Leon Edlinger

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Ort, Datum

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Paul Gigler

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Ort, Datum

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Andreas Weissl

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# **Abstract**

Abstract in English

# **Kurzfassung**

Kurzfassung in Deutsch

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## Thanks

It would not have been possible to carry out this thesis to this extent without the active support of a number of people. We would therefore like to thank everyone who supported us in the implementation of this thesis.

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# 1 Introduction

**TODO: Bitte noch anpassen falls euch der Wortlaut net so passt**

Mobile Apps get used for quite literally everything in today's World. So after we noticed that there is no application that allows the efficient planning of campaigns like the "Sternsinger-Aktion" we asked ourselves why, and furthermore, how hard it would be, to create an App with intuitive Usability for the sole purpose of simplifying the process of managing such a campaign and gaining a general overview of the progress made.

**TODO: Vielleicht noch kürzen, wirklich nur die groben Themen?** The research part of this thesis will be dedicated to how components should act and look, so that new users can use this tool without requiring a long "onboarding" phase. It should feel familiar to interact with elements and the borders of what users can and can't do need to be clearly defined. Because our application also needs a somewhat reliable data source to guarantee the consistency and accuracy of marked addresses in our app. For this purpose we researched ways to keep our database up-to-date, without the need of much manual intervention. After defining the projects requirements, we noticed that we need to somehow calculate which addresses are "Border" addresses. So we decided to take a look into different algorithms for this task and compare them concerning their efficiency and then decide on one of them and implement it.

This thesis contains an in-depth description of our thought and development process, as well as any other steps we took to achieve our goal of a functional mobile application that can be used by volunteers in course of the "Sternsinger-Aktion 2025" taking place in the parish of Lieboch.

**TODO: Wortwiederholung austauschen** The result of this thesis should be a mobile app that provides users with the addresses that they need to visit on this day. They then should be able to easily mark the houses they already visited. If something unusual happens at this address, the user should be able to take note of this, so the organizers have knowledge of it and can account to it in the following year.



## **1.1 Team**

## **1.2 Motivation**

## 2 Technologies

### 2.1 LaTeX

Hier kommt eine Beschreibung zu Latex hin

### 2.2 Project Management

Hier kommt Text zum Project Management hin

#### 2.2.1 Trello

Hallo, das ist Trello

#### 2.2.2 Sharepoint

und das ein Text zu sharepoint, wieso eigentlich

#### 2.2.3 Discord

und hier nochmal kurz Discord, kennt eh jeder

### 2.3 Frontend

#### 2.3.1 Dart

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### 2.3.2 Flutter

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## 2.4 Backend

### 2.4.1 Java Spring

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### 2.4.2 PostgreSQL

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## 2.5 Version Control

### 2.5.1 Git

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### 2.5.2 GitHub

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## 2.6 Map Data

### 2.6.1 OpenStreetMap

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### 2.6.2 Graphhopper

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## 2.7 Development Tools

### 2.7.1 VS Code

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### 2.7.2 IntelliJ

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### 2.7.3 Android Studio

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### 2.7.4 Postman

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### 2.7.5 Figma

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## **2.8 Deployment**

### **2.8.1 Docker**

### **2.8.2 Uberspace**

### **2.8.3 Webmin**

## **3 Wireframes**

### **3.1 Admin Ansicht**

### **3.2 User Ansicht**

## **4 Research Questions**

### **4.1 Leon Edlinger**

### **4.2 Paul Gigler**

### **4.3 Andreas Weissl**

## **5 Final Thoughts**

### **5.1 Leon Edlinger**

### **5.2 Paul Gigler**

### **5.3 Andreas Weissl**

## 6 Bibliography

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## 7 Appendix

### 7.1 Meetings

Protokolle der Meetings, vielleicht auch ein zeitplan wann immer und wie lang

## 7.2 Working Hours

Arbeitspaket-Nr.	Beschreibung	Dauer
1	Einführung und Einarbeitung	8 h
2	Grundkonzept erstellen	8 h
3	Struktur der App festlegen	6 h
5	Wifi-Socket in App implementieren	39 h
6	Write-Funktionalität in App implementieren	14 h
7	Read-Funktionalität in App implementieren	19 h
8	Trim-Funktionalität in App implementieren	10 h
9	Konfigurationsmöglichkeiten für Flug in App implementieren	16 h
10	Höhenregelung-Funktionalität in App implementieren	14 h
12	Graphische Darstellung der Flugdaten	18 h
14	App testen und debuggen	19 h
26	Gesamtkonzept testen und debuggen	16 h
Summe		187 h

Table 1: Arbeitszeitznachweis

## 7.3 Source code directory

Source Code directory, kein plan was des is



## **7.4 List of illustrations**

Liste alle abbildungen oder so, ka müss ma uns anschauen

## 7.5 Abbreviation

ADC	Analog Digital Converter
API	Application Programming Interface
BLE	Bluetooth Low Energy
CPU	Central Processing Unit
DAC	Digital Analog Converter
DAVE	Digital Application Virtual Engineer
DSP	Digital Signal Processor
FPU	Floating Point Unit
FPV	First Person View, First Pilot View
GPIO	General Purpose Input/Output
GPS	Global Positioning System
GUI	Graphical User Interface
HDMI	High Definition Multimedia Interface
I <sup>2</sup> C	Inter-Integrated Circuit
IDE	Integrated Development Environment
IP	Internet Protocol
RPI	Raspberry Pi
SD	Secure Digital
SPI	Serial Peripheral Interface
USB	Universal Serial Bus
TCP	Transmission Control Protocol
UART	Universal Asynchronous Receiver Transmitter
WLAN	Wireless Local Area Network
WPA	WiFi Protected Access
XML	Extensible Markup Language