

# **Anmeldeformular Unterstützung für das Sekretariat**

## **DIPLOMARBEIT**

verfasst im Rahmen der

**Reife- und Diplomprüfung**

an der

**Höheren Abteilung für Informatik**

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Leonding, April 2023

Ich erkläre an Eides statt, dass ich die vorliegende Diplomarbeit selbstständig und ohne fremde Hilfe verfasst, andere als die angegebenen Quellen und Hilfsmittel nicht benutzt bzw. die wörtlich oder sinngemäß entnommenen Stellen als solche kenntlich gemacht habe.

Die Arbeit wurde bisher in gleicher oder ähnlicher Weise keiner anderen Prüfungsbehörde vorgelegt und auch noch nicht veröffentlicht.

Die vorliegende Diplomarbeit ist mit dem elektronisch übermittelten Textdokument identisch.

Leonding, September 2023

D. Ortbauer

# Abstract

Brief summary of our amazing work. In English. This is the only time we have to include a picture within the text. The picture should somehow represent your thesis. This is untypical for scientific work but required by the powers that are. Suspendisse vel felis. Ut lorem lorem, interdum eu, tincidunt sit amet, laoreet vitae, arcu. Aenean faucibus pede eu ante. Praesent enim elit, rutrum at, molestie non, nonummy vel, nisl. Ut lectus eros, malesuada sit amet, fermentum eu, sodales cursus, magna. Donec eu purus. Quisque vehicula, urna sed ultricies auctor, pede lorem egestas dui, et convallis elit erat sed nulla. Donec luctus. Curabitur et nunc. Aliquam dolor odio, commodo pretium, ultricies non, pharetra in, velit. Integer arcu est, nonummy in, fermentum faucibus, egestas vel, odio.



# Zusammenfassung

Zusammenfassung unserer genialen Arbeit. Auf Deutsch. Das ist das einzige Mal, dass eine Grafik in den Textfluss eingebunden wird. Die gewählte Grafik soll irgendwie eure Arbeit repräsentieren. Das ist ungewöhnlich für eine wissenschaftliche Arbeit aber eine Anforderung der Obrigkeit. *Bitte auf keinen Fall mit der Zusammenfassung verwechseln, die den Abschluss der Arbeit bildet!* Suspendisse vel felis.

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# 1 Einleitung

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## 2 Umfeldanalyse

Citing [1] properly.

Kabellose Technologien sind in abgelegenen Gebieten wichtig [2].

When a new student is applying for the HTBLA Leonding he or she has to fill out the application form and bring to the school office. The person in charge of the application process has to enter the data into an access database provided by the system administrator. This process is time consuming and tedious especially because there are hundreds of applications every year. The goal of this project is to create an application that simplifies the this process for the school office staff and since those do usually not have a computer science background the application has to be easy to use and intuitive.

The app has to be able to handle multiple photos of the same application because it consists of multiple pages. It also has to contain some validation feature to allow the user to validate the output of the document understanding model because we are working with important data that must not be entered incorrectly.

Due to data protection laws the document understanding model has to be deployed on premise in the school network and not store any data unnecessarily.

The validated data needs to be entered into the access database provided by the school's system administrator. The database contains two important tables for the application. A table for the applicant's data and a table for the legal guardian's data. Both of those tables contain highly confidential data like a social security number, home address and religion, etc.

After the deadline for the applications the contents of the access database will be written to an excel file which will in turn be importet into Sokrates.

## **3 Technologien**

### **3.1 React Native**

React native allows for the development of cross platform mobile applications using javascript/typescript and the react framework. For this project React Native was chosen as the framework for the mobile application because of the author's experience with typescript as well as its cross platform compatability which is important because the school staff does not have a uniform phone operating system.

#### **3.1.1 Expo**

Expo was used as a development environment for its ease of use and quick development cycle. Expo allows you to use your own phone to test your application without the need for an emulator like Android Studio. It also enables the easy use of the camera via the expo-camera package which was especially useful for this project.

### **3.2 Visual Studio Code**

The author used Visual Studio code as his editor of choice for this project because it was set up very quickly without any complications.

### **3.3 Communication**

The communication between the document understanding model running on a flask server and the mobile application is done via WebSockets because the model needs to accept incoming images of the application form and return the extracted data for validation.

Was kann man da alles noch dazu schreiben? Access? Programming language?



# 4 Umsetzung

## 4.1 Mobile App

The mobile app was developed with react-native and expo. The setup for both was very simple and finished after a few npm commands.

The mobile app consists of multiple screens all accessible from the bottom tabbar. A screen for taking pictures of the application form1, one for viewing them and one to validate the data returned from the model2.

### 4.1.1 Camera Screen

The camera screen features a view of the cameras view, a small thumbnail for the last taken picture which leads you to the gallery screen when pressed, a button to take a picture and a button to send the pictures to the model. It is important to notice that the pictures are NOT saved on the users phone.

The CameraScreen1 asks for permissions to access the camera if it does not already have them.

Listing 1: Code for camera permissions

```
1   React.useEffect(() => {
2     (async () => {
3       const { status } = await requestCameraPermissionsAsync();
4       setHasPermission(status === 'granted');
5     })();
6   }, []);
```

### 4.1.2 Gallery Screen

If there are not any pictures taken the gallery screen just displays “no pictures taken” but if pictures were taken beforehand it displays the pictures newest first and allows you to switch between the pictures with arrows(right to go to older pictures and left to go to newer ones) the left arrow does not display while the newest picture is active and the right arrow does not display while the oldest one is active. There is button for

deleting a picture and one for replacing one which just deletes the picture and takes you to the camera screen.

### 4.1.3 Validation Screen

The validation screen displays the data returned from the model with the values from the application form. For each field it displays a label with its name and a text box prefilled with the models output. After the validation is done the validated data can be sent back to the server which then enters it into the access database.

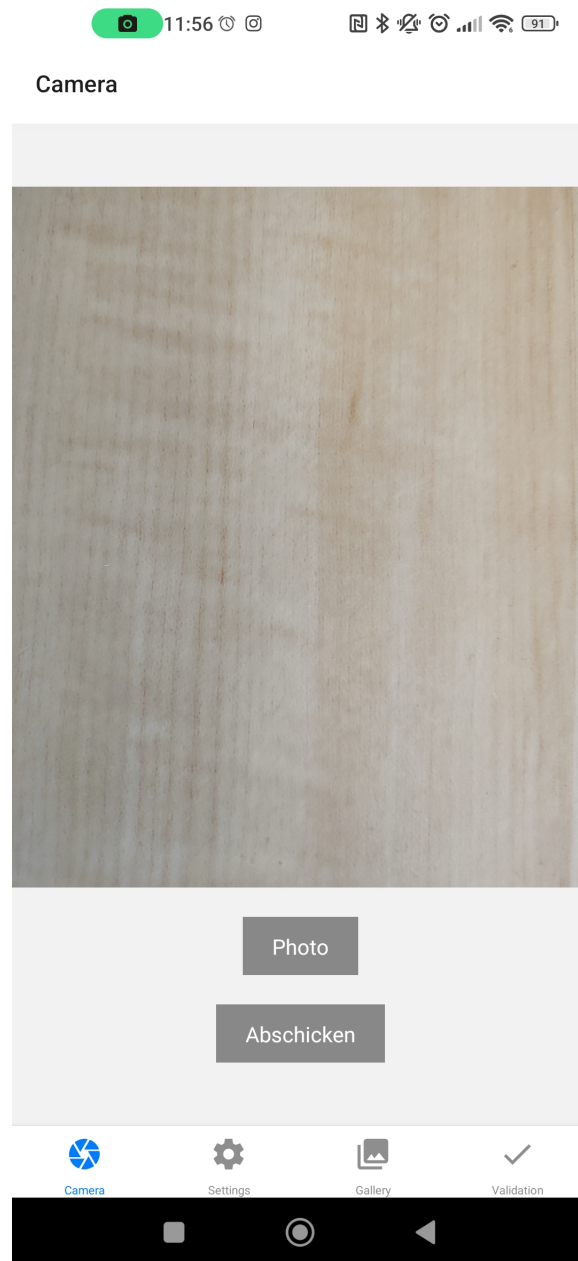


Figure 1: Camera Screen

11:56 [notification icons] [status icons] 91%

### Validation

Vorname:

Nachname:

Geburtsdatum:

[Finish](#)

Camera Settings Gallery **Validation**

Figure 2: Validation Screen

## 4.2 Access data entry

# 5 Zusammenfassung

Aufzählungen:

- Itemize Level 1
  - Itemize Level 2
    - Itemize Level 3 (vermeiden)
- 1. Enumerate Level 1
  - a. Enumerate Level 2
    - i. Enumerate Level 3 (vermeiden)

**Desc** Level 1

**Desc** Level 2 (vermeiden)

**Desc** Level 3 (vermeiden)



# Bibliography

- [1] P. Rechenberg, G. Pomberger *et al.*, *Informatik Handbuch*, 4. Aufl. München – Wien: Hanser Verlag, 2006.
- [2] Association for Progressive Communications, „Wireless technology is irreplaceable for providing access in remote and scarcely populated regions,” 2006, letzter Zugriff am 23.05.2021. Online verfügbar: <http://www.apc.org/en/news/strategic/world/wireless-technology-irreplaceable-providing-access>



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# Anhang