

#CallForCoughs - A Mobile App for Corona Detection and Data Collection

#1-020-corona-testprozesse-KI

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Summary

The ultimate goal of the app is the prediction that a person is NOT infected with the Corona virus based on data provided by the app users over a period of multiple days. In this way it should be possible to identify healthy people with a high probability which relieves the health system.

In the first stage the primary goal of the app is the creation of an individual user's dataset for machine learning scientists to create prediction models that indicate if a person is infected with the Corona virus. The app provides every user the possibility to provide anonymous health information on a daily basis that consists of audio samples, temperature and other symptoms (maybe also video or images?). Key idea is that in the beginning healthy, sick and undiagnosed people should provide data, i.e. once the status changes from undiagnosed to healthy or sick, a temporal dataset is established.

In a second stage, the app is extended with the functionality to predict the likelihood of an infection using a training machine learning model.

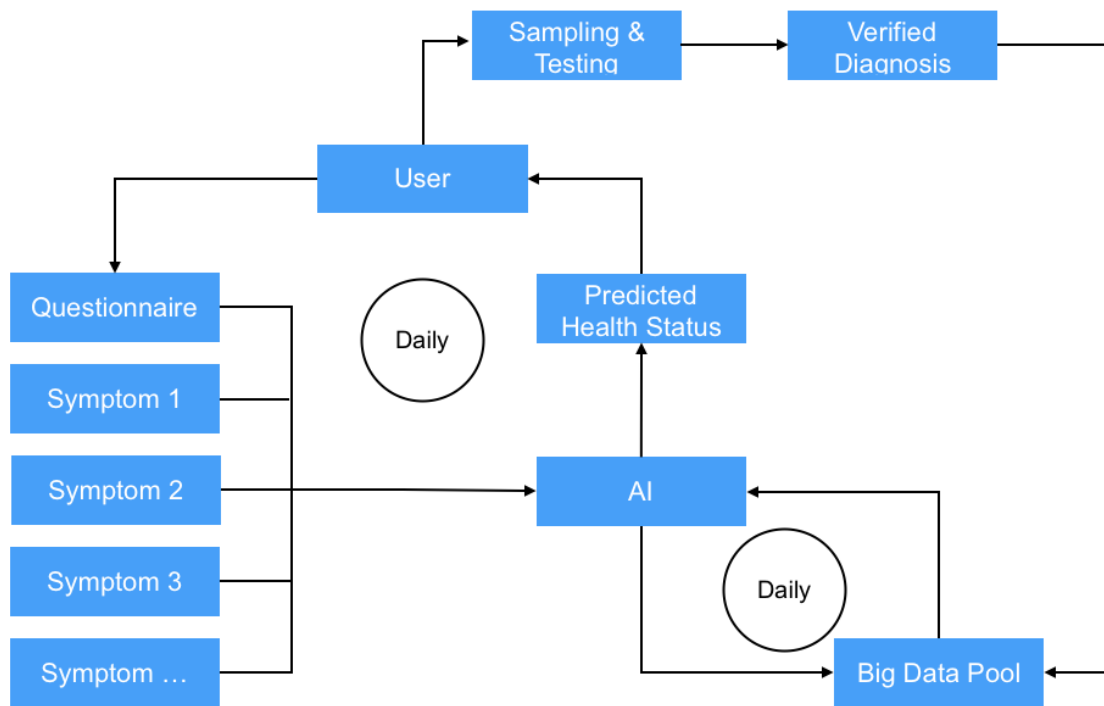
Waldamsel/Laura: alternative version

The ultimate goal of the app is monitoring of potential COVID-19 symptoms and the prediction that a person is NOT infected with the Corona virus. Prediction is done based on data provided by the app user over a period of multiple days/weeks, processed with AI to a. generate the user's „symptom baseline“ and b. to provide anonymously data to create a continuously improving prediction model. In this way it should be possible to predict that a user has not contracted COVID-19 with a high probability which relieves the health system.

In the first stage the primary goal of the app is the creation of an individual user's dataset based on a standardized questionnaire and recording of vital signs and potential symptoms like i.e. heart rate, body temperature and cough over a couple of days/weeks. On the one hand, the app provides every user with a health diary and monitor and establishes an individual baseline considering underlying conditions like ie asthma or chronic bronchitis. On the other hand, the app creates the possibility to provide anonymously health data that consists of audio samples, temperature and other symptoms on a daily basis. Key idea is

that in the beginning healthy, sick and undiagnosed people should provide data, i.e. once the status changes from undiagnosed to healthy or sick, a temporal dataset is established. Besides the app can be another basis to determine the need and priority of conventional testing and virus detection (PCR/antibody).

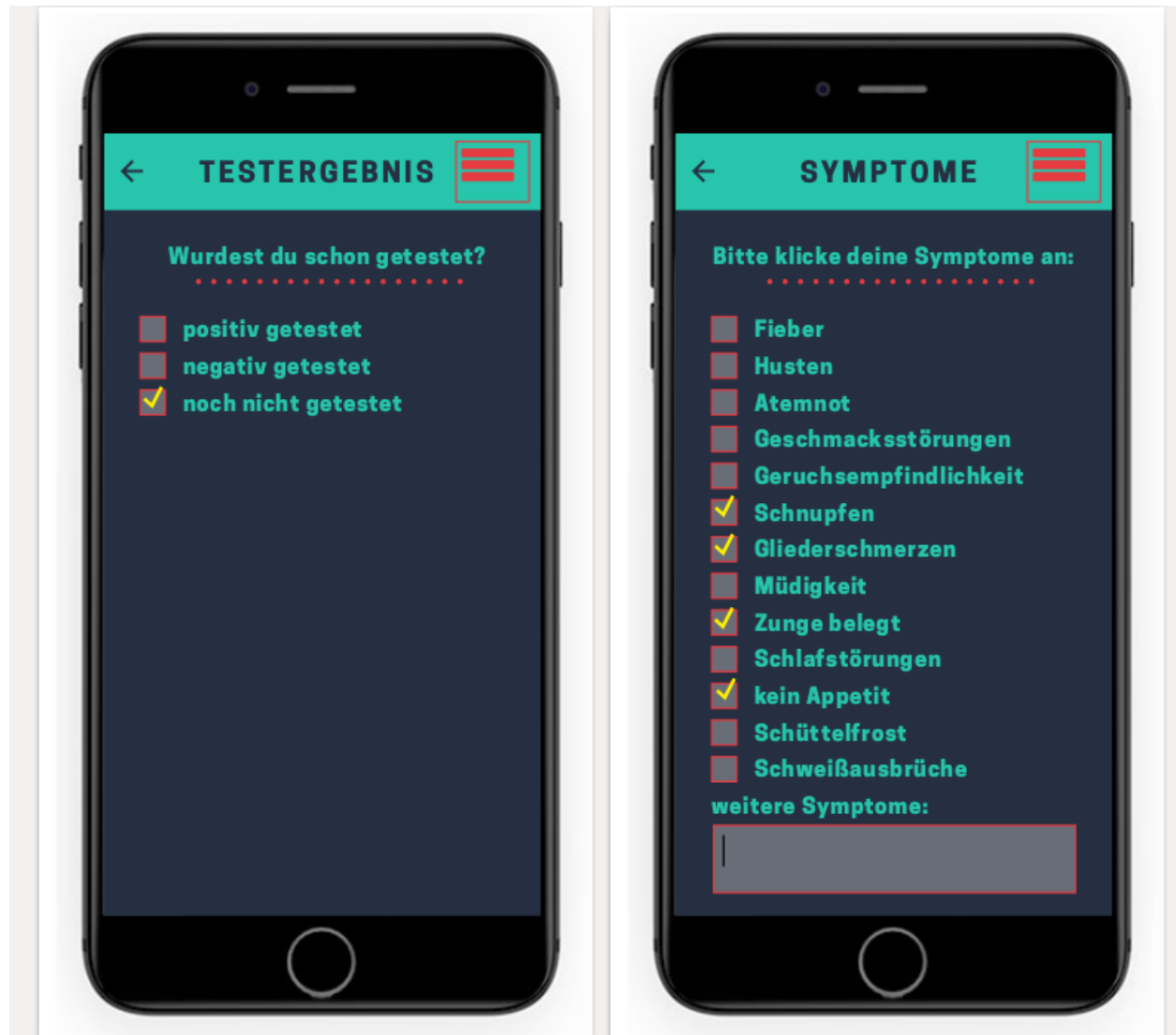
In the second stage, the data is correlated with a national/european/global database and the app is extended with the functionality to predict the likelihood of an infection using a training machine learning model. The dataset and prediction model would allow to differentiate with a high likelihood between COVID-19 and diseases with similar symptoms like influenza or a common cold.



App Look and Feel

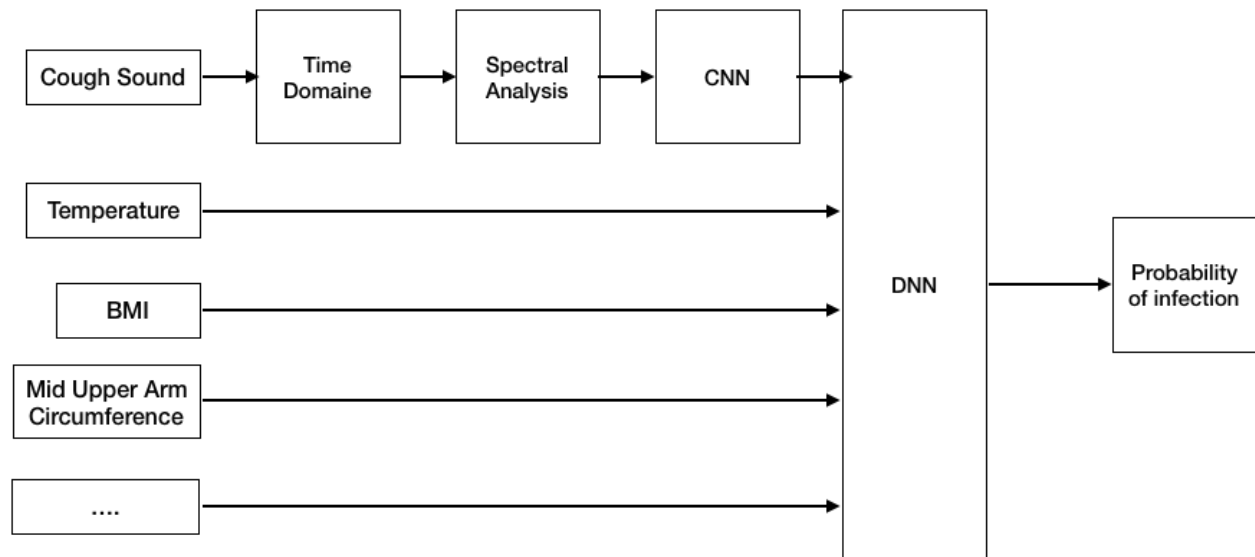
<https://wirvsvirus.slack.com/files/U010FNAR8AH/F010GRHBAFJ/getdatacoronaapp.pdf>

Provided by @Ornerute



Description of App Functionality and Software/AI Architecture

Provided by @Cassaf



Open points

- CNN vs. RNN to analyze time series audio data
- Which data to use to predict likelihood of COVID-19 vs other diseases with similar symptoms
- national/european/global database collecting symptoms and verified diagnosis allowing machine learning & feedback into app

KPIs

- App should keep gathering data and help identify the changes in potential symptoms over time
- Differentiation between COVID-19, influenza, common cold, allergy etc with a probability of x % in timeframe y
- False positives are allowed but should be kept at a minimum: suspecting someone who at the end is not infected is troublesome, but has no risk
- False negatives are a bigger problem: missing an infected person would cause the virus to continue its spreading

- App can track position and warn people who came in contact with the subject if confirmed as infected
- App should continuously learn and improve: learning can be done in the cloud due to being calculation intensive

Possible solution

- Using widely available smartphones and AI based App to support self-diagnosis, potentially infected people are detected early
- AI learning system
- These identified people can receive a test kit to their home to verify the suspicion of the App

Required Resources to Realize the App

1. First step: Collecting data
 - a. Project coordinators: Can we check with health authorities what data they can provide
 - b. Android/iOS Developers to implement App
 - c. UX/UI designers for App design
 - d. Developers for cloud infrastructure that collects data, etc.
 - e. Doctors or medical researcher to evaluate which symptoms should be tracked
 - f. Data Scientist to evaluate prediction concept
2. Second step:
 - a. Creation or link to a national/european/global database