TECHNISCHE HOCHSCHULE DEGGENDORF

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Temperature App

Mobile applications & interaction design in vehicle

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1 Introduction

In modern vehicles, maintaining an optimal in-car environment is not only a matter of comfort but also a crucial aspect of safety. Extreme temperatures, especially during hot weather, can turn a vehicle into a hazardous environment for children, pets, and even adults. Additionally, fluctuating cabin temperatures due to unpredictable weather or sudden exposure to the sun can lead to discomfort or even health issues.

2 Use case description

This use case describes the **Temperature App**, a system designed to monitor real-time in-car cabin **temperature** and **humidity**. It allows users to remotely control the vehicle's climate control system through an Android app, ensuring safety and comfort for passengers.

3 Objective

- Prevent heatstroke risks for children and pets.
- Enhance in-car comfort for the driver and passengers.
- Prevent sudden temperature changes, offering control over the cabin's climate before entering the vehicle.

4 Target Audience

The system is primarily designed for **mid-career professionals aged 30-45,** typically financially stable, and balancing their professional and personal lives. These individuals value convenience and seek smart solutions to manage their time and responsibilities. They are most likely to own vehicles with advanced features and appreciate technology that enhances their safety and comfort.

5 System working

The system operates through a continuous feedback loop beginning with sensor data collection every 10 seconds during active monitoring. The temperature and humidity sensor transmits data to the CC3200 microcontroller, which processes readings and establishes secure Wi-Fi communication with the backend server. The server evaluates data and updates the mobile application dashboard with current readings and trends.
Based on the sensor data, User has to give command to initiate reverse data flow through the system. The mobile application sends control requests to the backend server, which validates commands and forwards them to the CC3200 microcontroller. The microcontroller translates these into control signals and activates the Climate conditioning system.

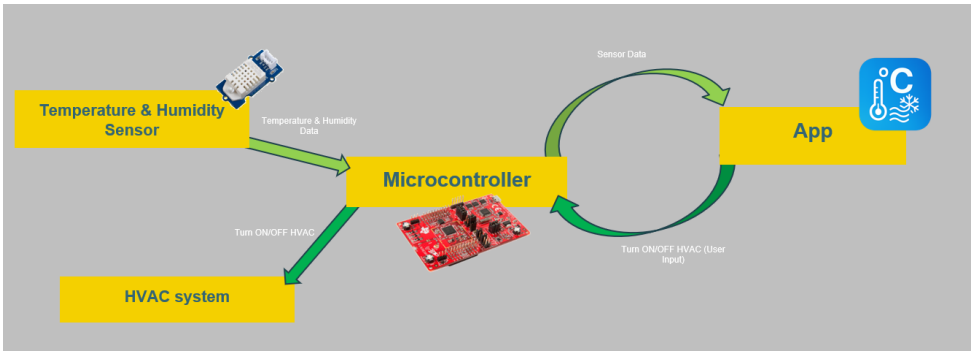

Figure 5.1: Working of the Temperature App

6 User Interface

The mobile application features a clean, intuitive interface designed for quick climate monitoring and control. The main dashboard displays two key sections, a Local Weather card showing external conditions (temperature, humidity, wind speed) based on user location, and a Car Cabin Conditions panel presenting real-time interior temperature and humidity sensor readings. The interface employs a simple yet effective control scheme with a prominent toggle button that changes from red (FAN OFF) to green (FAN ON), accompanied by clear status indicators. The card-based layout with modern typography and intuitive icons ensures users can quickly assess conditions and make adjustments without distraction while driving.

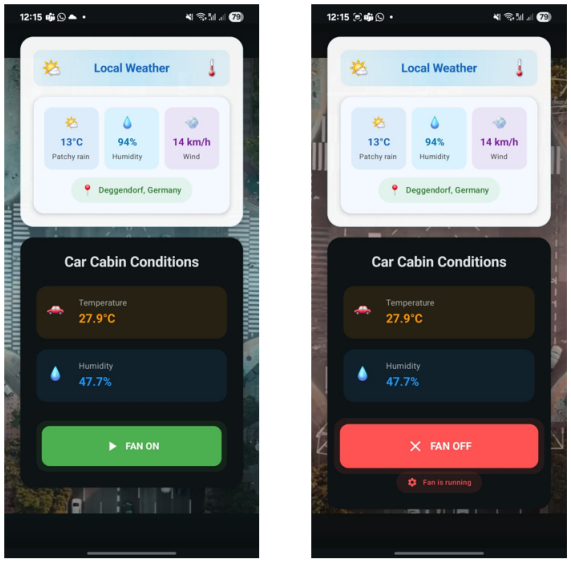

Figure 6.1: App screenshots

7 Conclusion

The Temperature App successfully addresses critical safety concerns for children and pets while enhancing comfort for busy professionals through seamless IoT integration. By combining real-time monitoring, intelligent automation, and intuitive mobile controls.