Low-energy backup communication system for hydrogen racecar

Jarno Mechele   Joey De Smet   Robijn Ameye

Faculty of Engineering Technology, KU Leuven - Bruges Campus
Spoorwegstraat 12, 8200 Bruges, Belgium
{jarno.mechele, joey.desmet, robijn.ameye}@student.kuleuven.be

Abstract

The abstract is a brief (50–80 words) synopsis of the paper. Use up to 5 keywords.

In a race with hydrogen cars its important for the pitwall to communicate with the car driving. At the pitwall there need monitoring of the cars condition and speech communication with the driver. This crucial for the course of the race. This leads to the need for a backup communication system in case the main system fails. This paper proposes a low-power, long-range wireless solution capble of transmitting and receiveing both sensor data and voice signals.

(76 words)

Keywords—component; formatting; style; styling; insert (key words)

I. Introduction

II. System Overview

III. Firmware Design and Implementation

In this section, we present the design and implementation of the firmware for the STM32U5, which enables two-way raw LoRa communication, speech synthesis and voice command recognition.

A. Firmware Design

[Describe the structure of the firmware. Mention FreeRTOS (if used), key modules/tasks, inter-process communication, power handling, interrupt strategies, etc.]

B. Testing and Results

[Discuss how you verified the system. Include relevant metrics: timing, memory usage, communication robustness, etc. Optionally describe test setups.]

C. Conclusion

[Summarize what you built, how well it works, and potential areas for improvement or future work.]

IV. Backend and graphical user interface Design and Implementation

V. Hardware Design and Implementation

References

[1] Author Name, *Title of the Book or Article*, Publisher or Journal, Year.