Internet-Enabled Telemetry Link for Autonomous UAV

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Autonomous Unmanned Aerial Vehicles (UAVs) are increasingly utilized in industries like agriculture and transportation. Yet, high costs and technical complexity hinder smaller entities from adoption. Our thesis aims to provide an affordable, internet-enabled alternative to costly proprietary systems, democratizing UAV access for all.

Overview

With the emergence of autonomous unmanned aerial vehicles (UAVs) across a plethora of sectors including agriculture, forestry, and transportation, the vast potential of this technology is evident. However, the steep entry barriers regarding cost and technical knowledge, often dissuade smaller businesses and enthusiasts from its adoption.

We aspire to break these barriers by democratizing access to autonomous UAV technology. We propose an affordable, platform-independent solution that integrates cost-effective, open-source hardware and software, aiming to bridge the gap between this advanced technology and the common user.

Communication Methods

One of the crucial objectives of this project was to devise a low-cost, internet-based telemetry communication solution. Our approach employs the cellular network to facilitate interactions with the UAV, thereby eliminating geographical constraints and vastly broadening the operational scope. Furthermore, devices like IoT-sensors can access network resources for data exchange and real time processing.

Accessibility

The fruits of our project are shared openly, establishing an accessible gateway for anyone intrigued by the prospect of implementing autonomous UAVs.

Objective

The central ambition of this thesis is to provide a user-friendly introduction to UAV technology that doesn't necessitate extensive prior knowledge. Our comprehensive guide is designed to be versatile, catering to various applications and airframe types, enabling users to explore the technology of UAVs for their personal or business applications, thus democratizing access for all.

Achievements

Our results include a detailed guide for building an autonomous, fixed-wing UAV, utilizing an assortment of low-cost, open-source hardware and software. This resource not only elucidates the technologies employed but also furnishes users with the adaptability to apply this information across diverse airframes and applications.

Further, we've successfully established a simplified method for UAV flight controller communication via the cellular network, greatly enhancing the usability of UAVs by transcending the traditional boundaries of location.

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Second prototype UAV with autonomous flight capabilities and IoT telemetry link

Communiction illustration using the cellular network