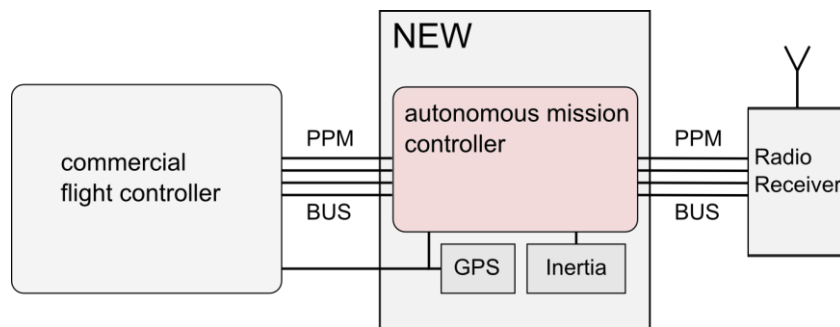




Implementing an Autonomous Mission Controller for Quadcopters

Introduction:

Multirotors are very well suited for environments with limited space, such as urban environments and forests. Their vertical takeoff and landing (VTOL) capability together with their ability to hold its position in the air makes them ideal for flying indoor and for aerial filming. This makes them an ideal vehicle for research purposes. However, most buyable multirotor controllers do not support autonomous flight or mission planning and provide only very restrictive interfaces for controlling them. For that reason, this work aims to implement an additional mission controller module that is connected in-between the receiver and flight controller to extend the basic functionality of the flight controller with respect to autonomous flight and mission planning.



Content:

The objective of this work is to develop an autonomous mission controller that can interact with most commercial available flight controllers via PPM bus and provide additional interfaces to enable autonomous or preprogrammed flying missions. The mission controller board contains a 32bit ARM microcontroller, as well as GPS and its own inertia sensors. The main focus lies on the concept of design and the programming of the mission controller. To this end, the student is provided with an ARM development board, wireless transmitters and a ready-to-fly quadcopter (360mm size). As an optional goal, the student can design the PCB layout for the hardware.

Requirements:

- Very good programming skills in C for microcontrollers
- Self-reliance
- optional: experience with RC-models, Hardware design with EAGLE or similar programs

Contact:

If you are interested, please send a CV and a transcript of grades to: philip.parsch@cs.tu-chemnitz.de