



Szakdolgozat feladat

Futó András

szigorló BSc. villamosmérnök hallgató részére

Building a Forward Motion Compensation (FMC) system for aerial mapping cameras

The project involves compensation for the blur in aerial photography caused by the forward motion of a mobile camera. The focal plane of the camera will point to the same position on the ground while its shutter is open. A camera mount, previously used by Mate Nemes (a previous BME EE student) will be used and improved. The system pitching motion will be utilized with a camshaft and a brushed DC motor which is part of the system and is available. The motor includes a brushed tachometer.

The electronic system components designed and built will utilize an available *myAVR Board MK3* microcontroller development board. A 4x4 numeric keypad and a graphic LCD screen will serve the function of a user interface. A new optical quadrature encoder will be integrated to determine the accurate camshaft position and velocity for controlling the motor drive and the camera shutter. The FMC system will interface with a Fairchild K-17 compatible aerial mapping camera and a camera intervalometer. The correct motor speed will be calculated from platform altitude and velocity information obtained from a GPS receiver using the NMEA communication standard. The device will operate from a 24 V lead-acid battery. The DC motor drive will be supplied with 48 V by a DC-DC converter. The logic will operate from 5 V.

The tasks involve the following steps:

1. Redesigning and modification the mechanical system in order to accommodate the optical quadrature encoder on the shaft according to specifications and requirements.
2. Design of electronic circuits for interfacing the GPS, optical encoder, intervalometer, camera, and the user interface. Design of a power supply for driving the 5V logic from the 24 V battery.
3. Ordering, placement and soldering of the parts, measuring the circuits and documenting the results.
4. Development of software for Motor control, GPS communication, Intervalometer and camera interface and user interface. Software will be written for the storing and retrieval of the received time and position data for each photograph.

The language of the degree thesis is English.

Tanszéki konzulens: Dr. Kiss Bálint docens

Külső konzulens: Dr. Charles Bostater, Florida Institute of Technology

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Záróvizsga tárgyak:

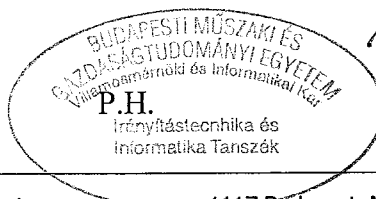
Közös BSc záróvizsga – MSc felvételi vizsga

Programozható irányítóberendezések és szenzorrendszerek

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