Using gimbal stabilizers on superzoom cameras

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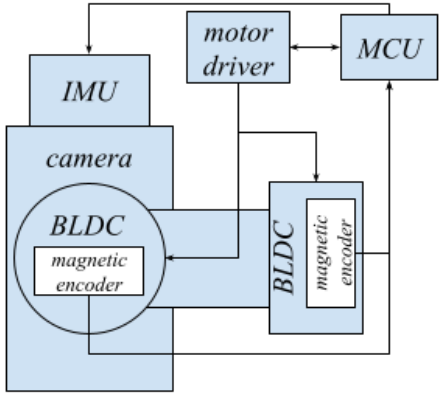
Background

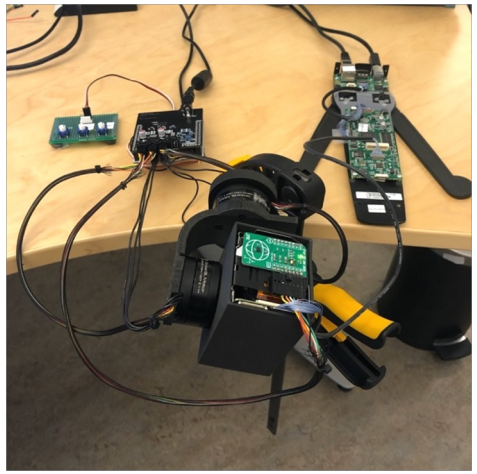
At the request of Low Vision International, this thesis is aimed at determining the viability of using electronic gimbals for stabilizing cameras used in the company's visual aids systems.

Method

Designing a gimbal prototype with bottom-up approach – grants low-level control and understanding of the system and its functions.

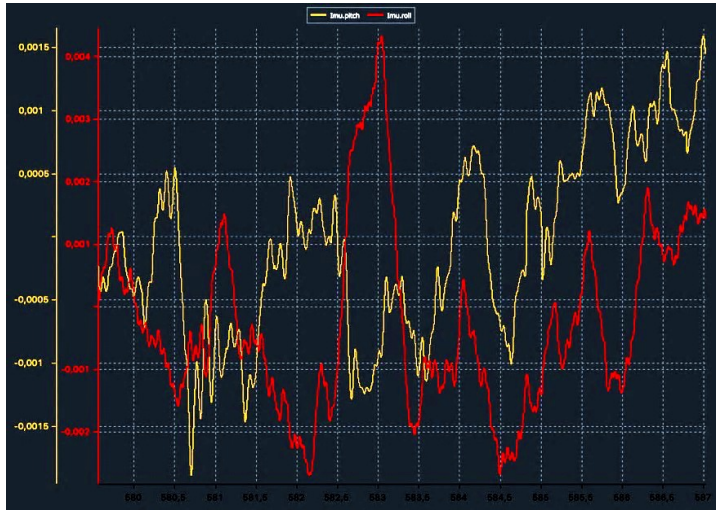


The prototype consists of a 32-bit microcontroller, BLDC-motors, an inertial measurement unit (IMU), and magnetic encoders. The components are placed on custom-made PCBs, and all code is written in C.



Conclusion

In its current state, the prototype did not provide enough stability. The instability may depend on factors such as low-resolution encoders and IMU, non-optimal code, etc.
Since the gimbal is constantly compensating for minimal angular change, it produces a sustained jittering movement on the camera.



Discussion

The prototype may act as a base for further studies on the subject and for other future projects, such as in-house development of Pan-Tilt-Zoom (PTZ) cameras.