



Revolutionize Projection Mapping Using Drones

Projection Mapping is a common technique to augment the appearance of physical objects using digital illumination, or *projectors*. This technique is used in demos, shows, teleconferencing, and others. One of the technique's biggest drawbacks is the setup – the hardware must be carefully calibrated to itself and its surrounding. We propose to **mount the setup onto a drone**, enabling a mobile setup, with complete projection flexibility due to the drone's maneuverability. In collaboration with the school of Computer Science.

Goals:

The project will include the following steps:

- Mounting a camera and pico-projector (<https://www.amazon.com/Sony-Mobile-Projector-connectivity-MP-CD1/dp/B07C8WFZBM>) onto a drone, perhaps with a motion stabilizer (ref gimbal)
- Calibrating the camera and projector before flight (https://www.researchgate.net/publication/251735497_Novel_method_for_structured_light_system_calibration)
- Identifying a specific object (<https://www.uco.es/investiga/grupos/ava/node/26>), positioning the drone accordingly, and augmenting its appearance (<https://web.media.mit.edu/~raskar/Shaderlamps/>).

Requirements:

Serious, ambitious and diligent student with high grades.

Skills (advantage if already known; otherwise will be acquired):

- C++, C, Python, Linux
- Computer Vision

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