

# A Motion-Tracking DMX512 Controller

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Some modern theatrical lighting instruments are able to rotate in two dimensions; they are referred to as 'moving lights.' Integrating motion tracking capabilities with a moving light would create a real-time spotlight which automatically follows a person or an object onstage. This final project aims to incorporate motion tracking with a DMX512 controller. At the highest level, the project is designed to intercept DMX data from a lighting board, process video data, combine calibration data with the processed data, and output altered DMX to the moving lights for which the original DMX was intended. The system also outputs a video stream for testing purposes and to allow the project to be functional without a DMX-controlled lighting instrument.

The project will start by tracking a uniformly colored object on a uniformly colored background. As the system's precision increases, the motion tracking will be able to track objects by pattern. Ultimately, the project will be able to track a person and will use a moving light, not a computer screen, for debugging and proof of concept. Stretch goals of the project include automatic instead of hard-coded calibration, data reading in addition to data writing, and color matching. The ideal outcome and primary motivation is to be able to package the project as a freestanding device which could be used in future performances and research.