

# Photography System for People in Wheelchairs

Daisy Hernandez, Malak Zayed, Daniel Avila  
Dr. Xia Ting/Dr. Kelly Gross

Department of Electrical Engineering and Department of Mechanical Engineering



NORTHERN ILLINOIS UNIVERSITY

College of Engineering and  
Engineering Technology

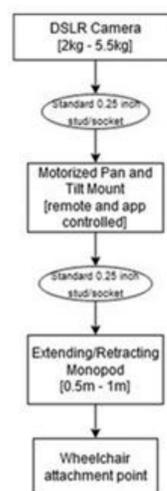
## Abstract

Basic photography pose difficulty to people with physical differences. A lack of commercially available solutions was identified, and the subsequent solution was designed. The object of this report is to describe and evaluate the possible design solution created. Evaluation of the designed solution identified a monopod as the optimal solution. The monopod consists of an attachment point for a wheelchair, onto which a retractable shaft is attached, which supports the digital single-lens reflex (DSLR) camera electronically controlled positioning mount. The device helps the physically limited to set up and operate camera functionality with little to no assistance. Evaluation of current market offerings suggests not only will the modified tripod be a viable solution to the issue, but also a probable solution for the lacking market. The device is to be implemented in a high school classroom setting to enable those with physical differences to participate in still imagery.

## Introduction

### Objectives:

1. Design photography system to be wheelchair attachable
2. Develop extending and retracting center column
3. Motorized pan and tilt controlled remotely

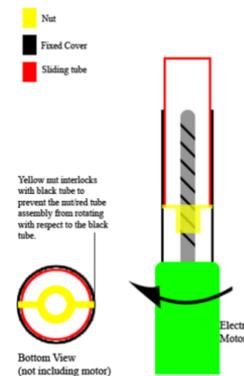


## Methods and Materials

**Motorized Pan and Tilt Camera Mount:** The mount was constructed using ABS plastic for the mechanical components. The pan and tilt functions are controlled using two DC motors. When assembled, the mount can be controlled via a wireless remote that is synced to the mounts circuit.

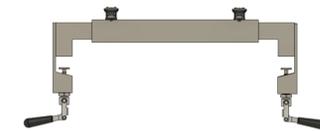


**Motorized Center Column:** The camera mount sits on top of a linear actuator. This is constructed with a motor, long threaded screw, a nut, and two aluminum sliding tubes. This linear actuator converts rotary motion to linear motion. It has a span of about 12 inches (30.48 cm).



**Wheelchair Mount System:** Using 6061 aluminum for the base structure provided strength and stability for the system. The L-connectors are designed to attach

to each side of the aluminum base as well as having the capability of extending horizontally through slots for varying armrest widths. Mounting brackets are implemented into the L-connectors for an increase in height of system and for secureness of clamps to wheelchair



## Results

Testing concluded that the designed device met or exceeded requirements. The device is to be implemented in a high school setting with students wanting to partake in photography.

## Conclusions

The design of a photography system for persons with physical limitations is a valuable device as there are currently no available devices that provide the needs to photographers with physical limitations. The modified motorized monopod discussed accommodates persons with physical disadvantages and allows them to freely participate in photography.

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