

Opera Hack 2019

Project Name: Open Source Automation

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OVERVIEW

Theatrical automation equipment has a high cost of entry and steep learning curve. To combat this an open source, off the shelf automation system could give the opportunity so any organization can to work and learn with automation.

The open source automation system would give the resources to build a full automation system to anyone with an interest. The system would comprise of a low load winch (around 25lbs max capacity) and an expandable controls system. The system would be comprised of parts that are easily accessible and a manual to teach how to create the system from the ground up. By creating an open source system anyone who is interested could purchase off the shelf parts on their own and focus on making the best system for their use.

The control system will integrate as many open sources resources already available to drop the overall cost of the system to make it easier for technicians of any experience level from high school to opera technical directors, to build and deploy in productions.

IMPACT

This project would give live event organizations of any type the ability to build, troubleshoot, and program an automation system from the ground up on a scale that will not have the same life safety concerns, high cost of entry, or experience needed for professional systems. This gives the opportunity for technicians to learn about scenic automation while also having a usable piece of equipment. The product would expose directors, audiences, and performers to the rising scenic automation sector.

The capstone of the project could produce an instructable (instructable.com) style document allowing users to create the equipment with their own pace and resources.

BUDGET

Amount	Part	Description
\$500	Motor	Motors, Servo and Stepper to test load capacities
\$500	Mechanical Hardware	Frame, drum, and tensioner for the winch
\$300	Controller	Raspberry Pi and Arduino to control the motors
\$300	HMI	Touchscreen and pushbuttons to operate the machine
\$400	Wire/Prototype Misc.	CAT5 cable that will connect the controller to the motors to account for electrical components and tools

Total Budget: \$2000

TIMELINE

November 2019

- Wiring diagram complete
- Motor and control components ordered
- Mechanical system design complete

January 2020

- Move motor with control system
 - Distribution of the second round of funding

February 2020

- HMI connected to motor and control system

April 2020

- Mechanical fabrication

May 2020

- Documentation and Intractable complete