

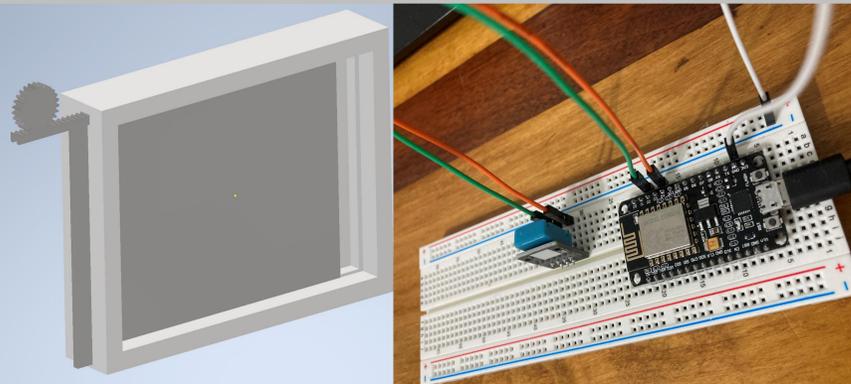
Abstract

The Passive House Motorized Shutter creates a greater R value for windows than current high-performance windows. The device employs motorized shutters to control heat gain/loss through the windows which will improve the temperature regulation inside homes as well as decrease electricity consumed by traditional HVAC systems. The goal is to minimize the cost of electricity for homeowners.

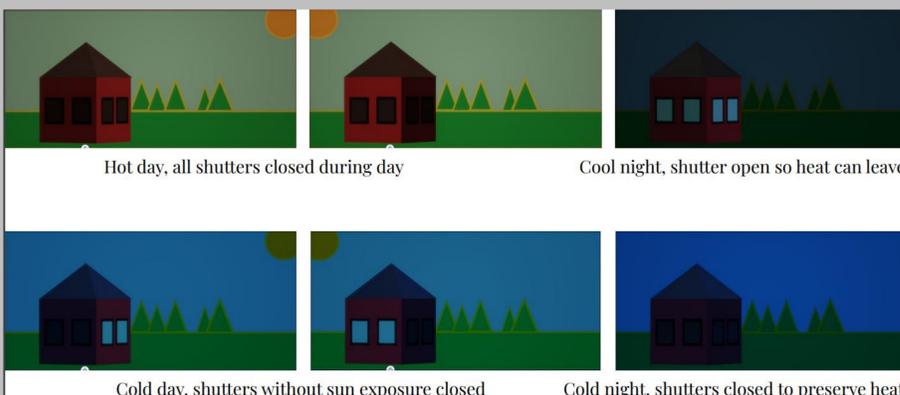
Problem & Need

Heating and air-conditioning are one of the largest users of electricity in a residence. On top of using the most electricity, currently most US homes use a phase change air conditioner to control the temperature inside a house. These systems are expensive to install and maintain. To make matters worse a lot of homes lack the required insulation to make these systems effective and efficient.

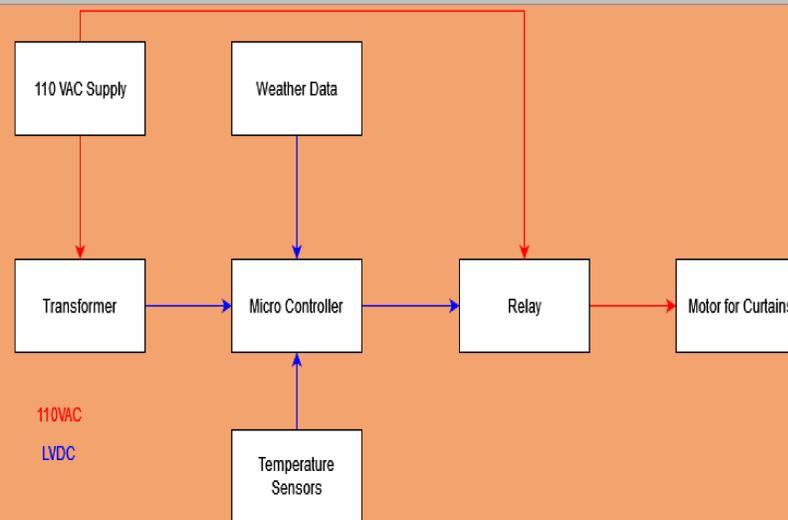
Design Concept



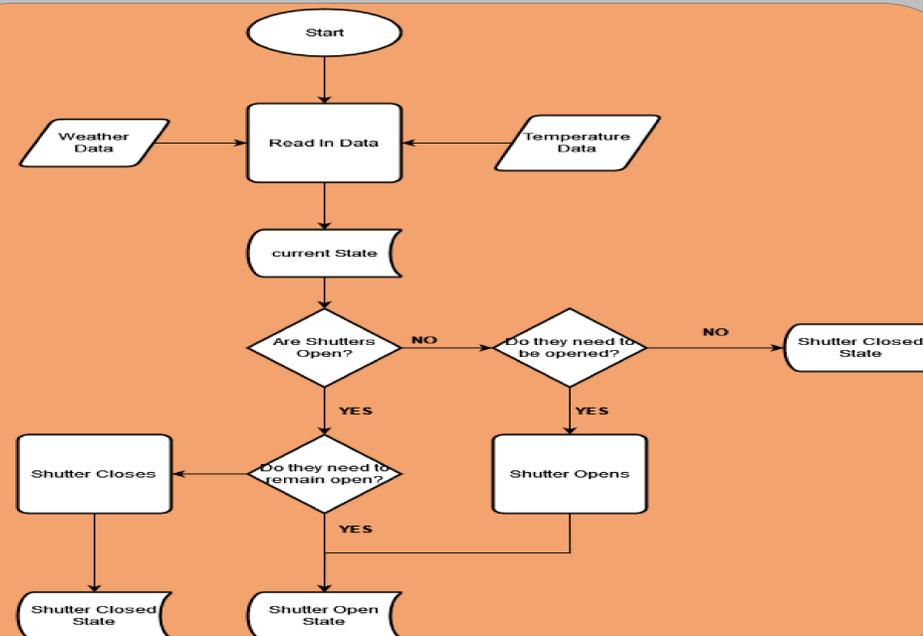
Motor rotates gear, which moves shutters into/out of position (pictured above).



Hardware Diagram



Software Diagram



The Team



Shiloh Pennock
Documentation



Favour Alabi
Documentation lead



T'rel Taylor
Tech lead



Nick Langhorne
Project lead

Components

Transformer



Motor



Microcontroller



Relay



Summary

As this product is still in the beginning stages of production, we would still have many demo versions tested before sending the systems to mass production. We would also need to better estimate the life cycle of the machine for maintenance/upkeep in the future. Once all of the design details are finalized, we would patent the design and begin installation into homes.

Glossary

Phase Change Air Conditioner – System that manipulates phases of the refrigerant to obtain cooling and or heating

HVAC – Heating, Ventilation, & Air Conditioning

R Value – Refers to how well an item thermally resists change

VAC – Volts AC (Think plug sockets)

LVDC – Low Voltage DC

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