# STEM: Virtual Green House and IOT

Model was built in blender software and exported in gltf format

Verge3d software used for 3d interaction and logic

Paho MQTT library for Javascript used for IOT communication

Live weather data acquired from visualCrossing.com, representing the outside weather conditions

## Green House functions

* Top Roof left and right open-close
  + Rotating from 0 to 200 in any position
  + Automatically closes roof left or right according to wind direction and speed>10Km/h
* Ventilation system works manual or automated
  + Manual start ventilation using 5 levels of speed
  + If inside temperature and humidity is higher than outside, ventilation reduces them
* Adjust glass transparency of green house
* Control lights inside green house
* Photovoltaic panel produces energy according to solar radiation of live weather data

## Admin page

Set

## Config page for settings

1. Real place of Green House
2. MQTT broker host and port
3. MQTT custom topics for data exchange
4. Wind speed low limit for closing roof

## Resources

Verge3D : <https://www.soft8soft.com/verge3d/>

Paho MQTT : <https://eclipse.dev/paho/>

Get weather condition from specific place : <https://weather.visualcrossing.com/VisualCrossingWebServices/rest/services/timeline/Rethymno?unitGroup=metric&include=current&key=TW7EQVLWLX7F6V9G93YB5SL2H&contentType=json>

Solar panel and temperature

<https://www.bostonsolar.us/solar-blog-resource-center/blog/how-do-temperature-and-shade-affect-solar-panel-efficiency/>

Reduce of efficiency -> (temp-25) \* 0.38%