A Different Perspective For Running Radiance

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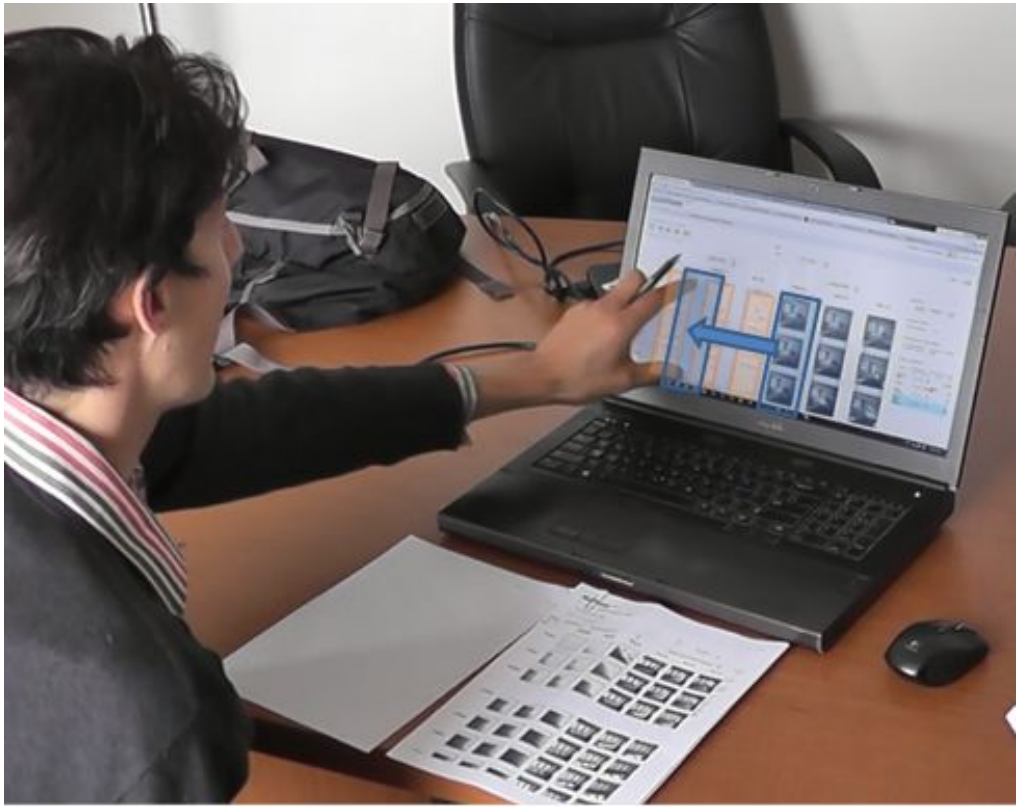
Radiance Workshop
ARUP, New York
August 23, 2019

LightStanza

Radiance as a Service (RaaS)

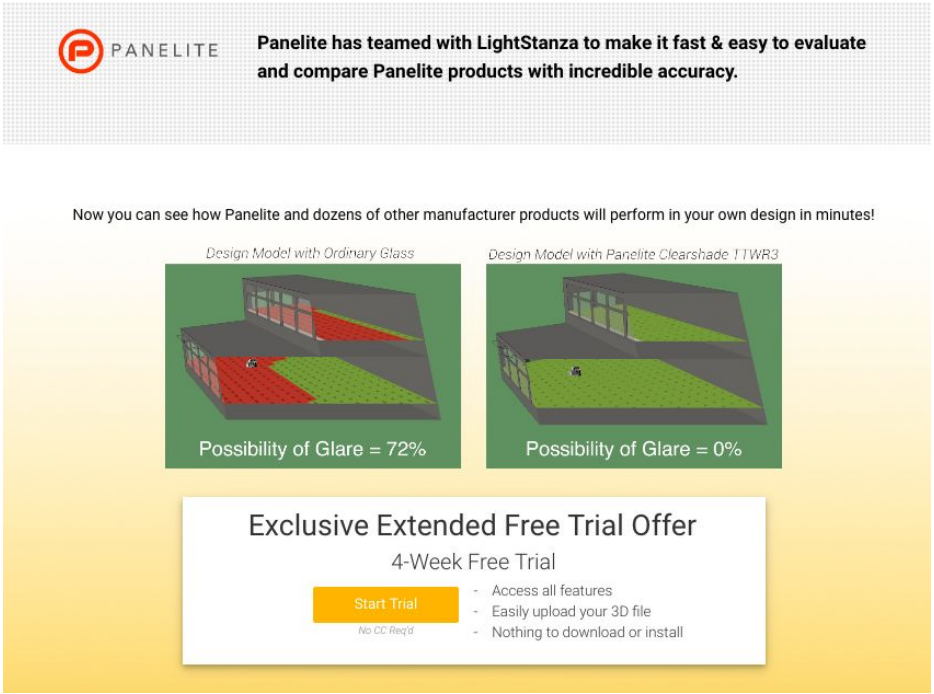
- Web Application
  - Cloud Computing
  - Streamlined User-Interface
  - Collaborative
- Integrates with Revit, Rhino and SketchUp
  - Revit Plugin
    - Automatic Sync
    - Converts Glazing
    - Electric Lighting
  - Rhino Import
  - SketchUp Plugin



LightStanza

LightStanza makes it easy to spec manufactured products

- Manufacturers give out 30 day subscriptions to Specifiers (consultants & architects)
- LightStanza allows Specifier to easily apply product to their building
- Specifier and manufacturer can communicate through the app
- No installed software by specifier is necessary
- Usage statistics for Manufacturers



example: Panelite landing page

Standard Ways of Running Radiance can be Tedious

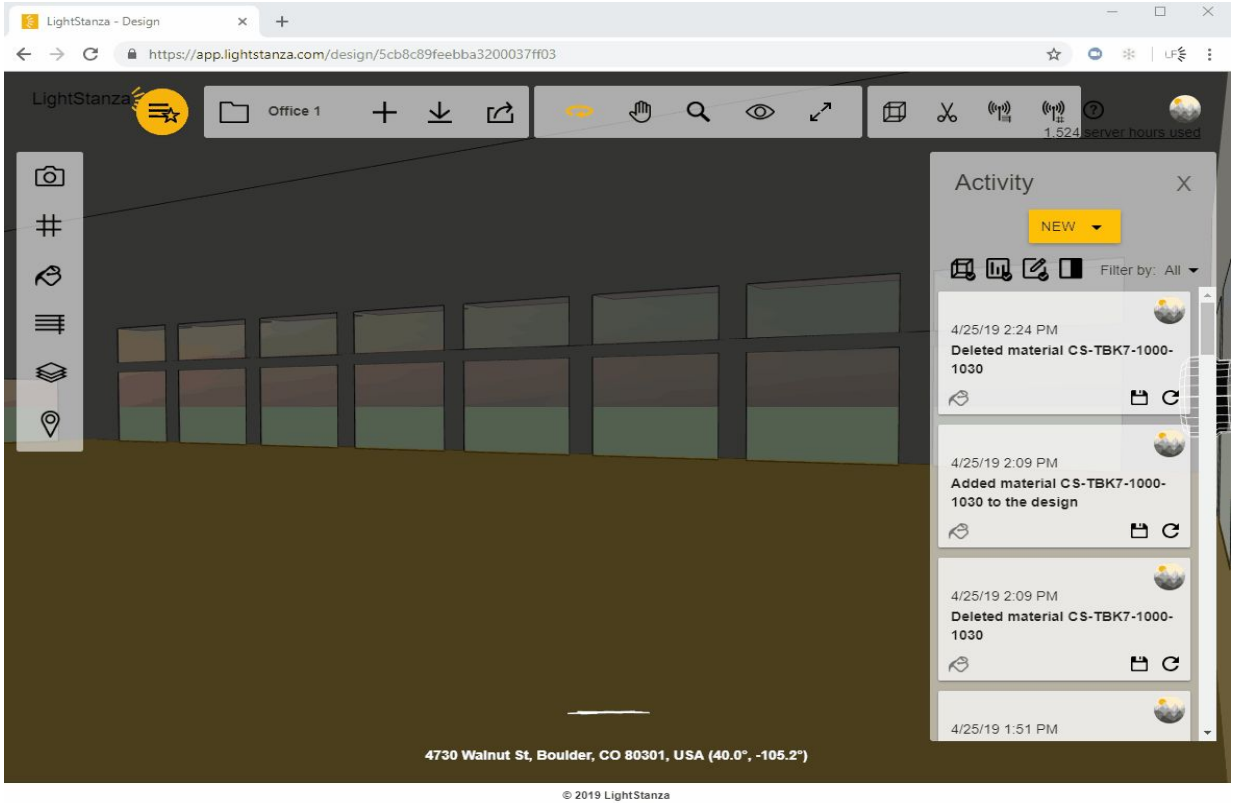
MicroShade® are available for selection. To download a BSDF file, click on the appropriate MicroShade® type below.

- MS-A (Used in south facing facades)
- MS-D (Used in east and west facing facades)
- MS-RS (Used in roofs with inclination <30°)
- MS-RW (Used in roofs with inclination between 30° and 80°)
  - MS-RW 90° - MS-RW rotated 90°
  - MS-RW 180° - MS-RW rotated 180°
  - MS-RW 270° - MS-RW rotated 270°

Can be Tedious and Error Prone!

A rotation of MicroShade® is normally done to optimize the g-value. For vertical facades MicroShade® are never rotated, while MicroShade® in roof windows can be rotated depending on the orientation and inclination of the roof. Rotation should be considered for MS-RW for orientations between northeast (45°) and northwest (315°) for all roof windows. Please contact MicroShade A/S at support@microshade.dk in these cases to get the right rotation angle.

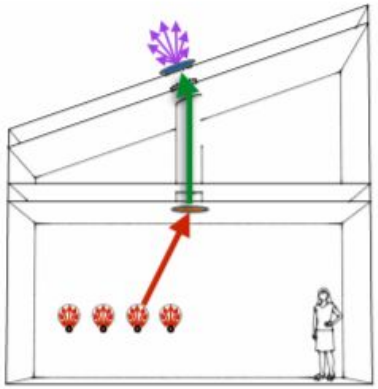
How Can LightStanza Make this Process Easier?



Drag and Drop BSDF that Automatically Orients Itself

Expert Tubular Daylight Device (TDD) Modeling

```
rmtxop   results/points.vmx bsdf/lens.xml \
         results/LP_trans.mtx bsdf/glass.xml \
         results/exterior.dmx skies/12_21_15.skv
    | rmtxop -fa -c 47.4 119.9 11.6 - > illum_12_21_15.txt
                  (Change from Irradiance to Illuminance)
```

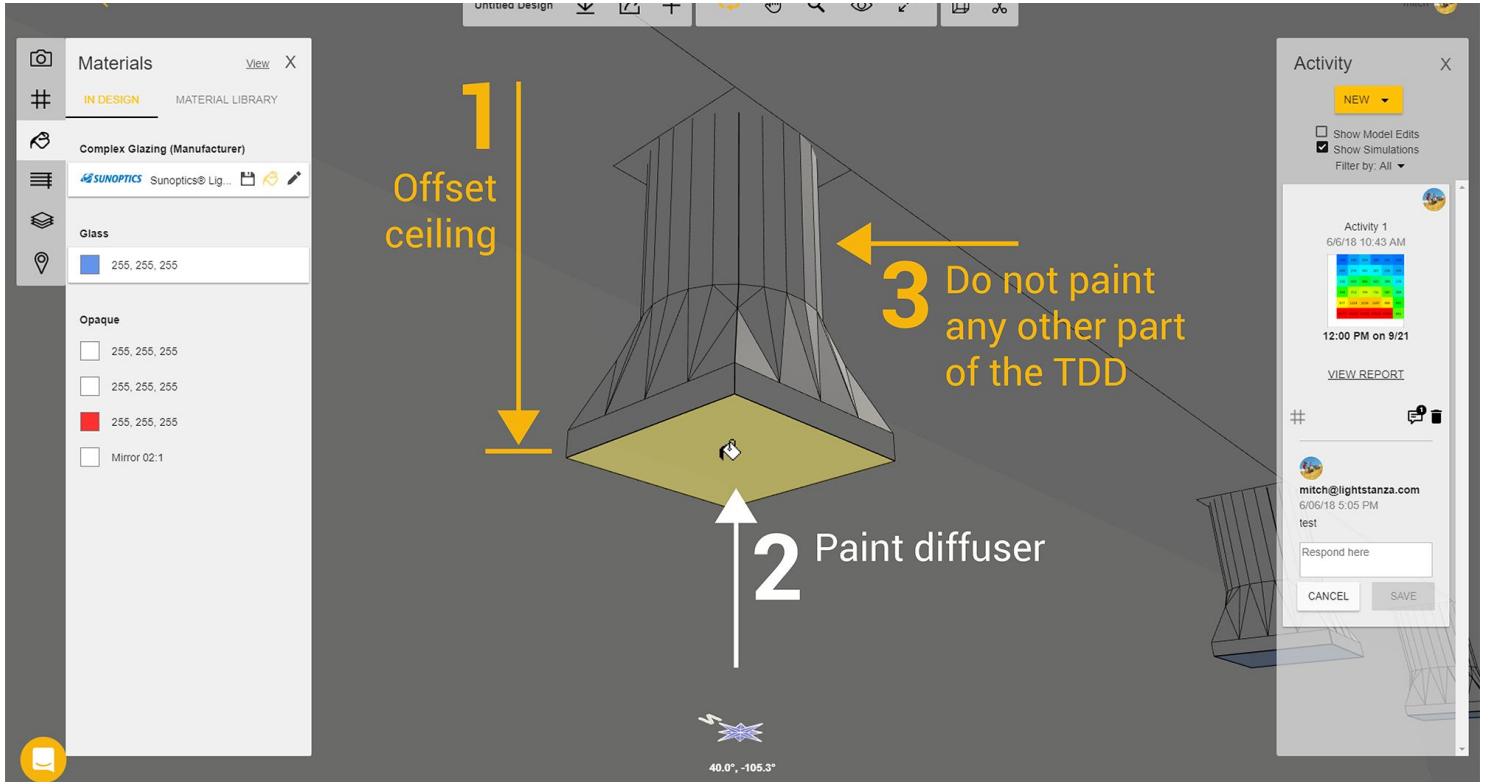


```
#?RADIANCE
rmtxop -fa -c 179 0 0 -
NROWS=5
NCOLS=1
NCOMP=1
FORMAT=ascii

2.767935412636226e+00
2.971198976613583e+00
3.337874915476797e+01
3.173601257922114e+00
3.558548860092117e+00
```

McNeil 2014 Radiance Workshop

Simplified Application of TDD's with LightStanza

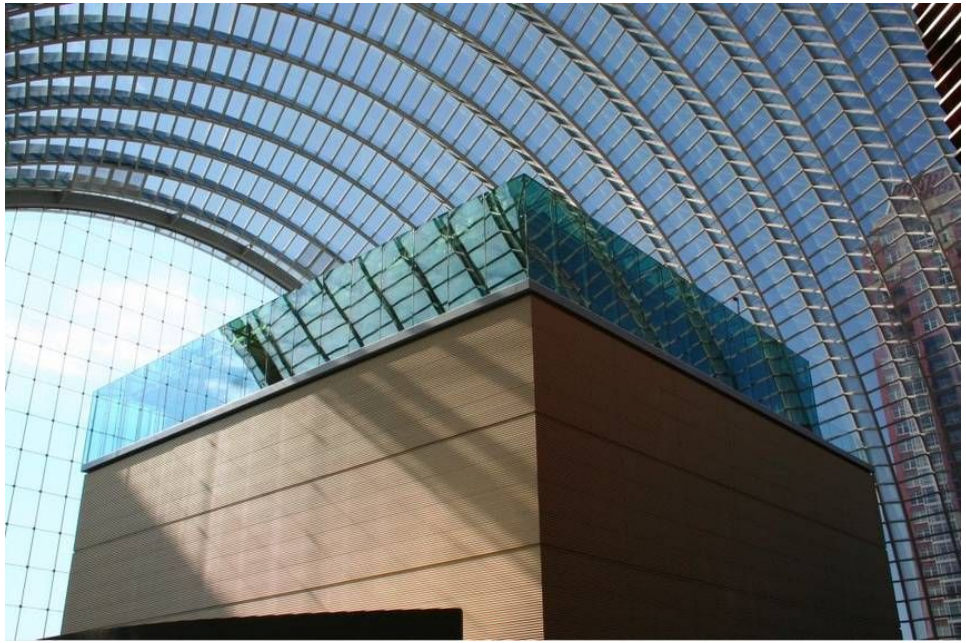


LightStanza

* Can import XML Files

SageGlass-LightStanza Integration Goals

- Allow more people at SageGlass to model their product
- Allow specifiers an easy way to see how their building performs with their glass
- Customized reports
- Anonymous Usage Analytics



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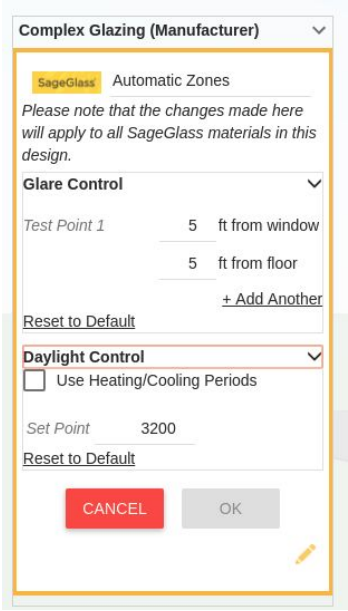
Control Panel- Benefits on Both Ends

Specifier



- Gives customer access to proprietary algorithm
- Control Panel shows public part of the algorithm
- LightStanza's simulation engine runs with complete algorithm

Manufacturer

SageGlass®

confidential

- More detailed panel with proprietary information
- Panel can only be accessed by manufacturer
- Panel hidden from customers

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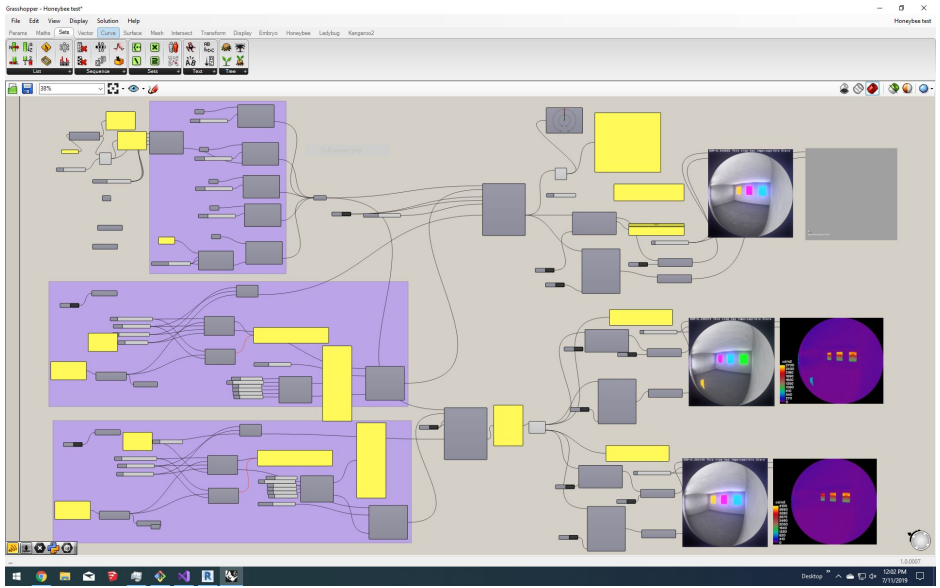
How To Create an Isomorphic Workflow?

Grasshopper



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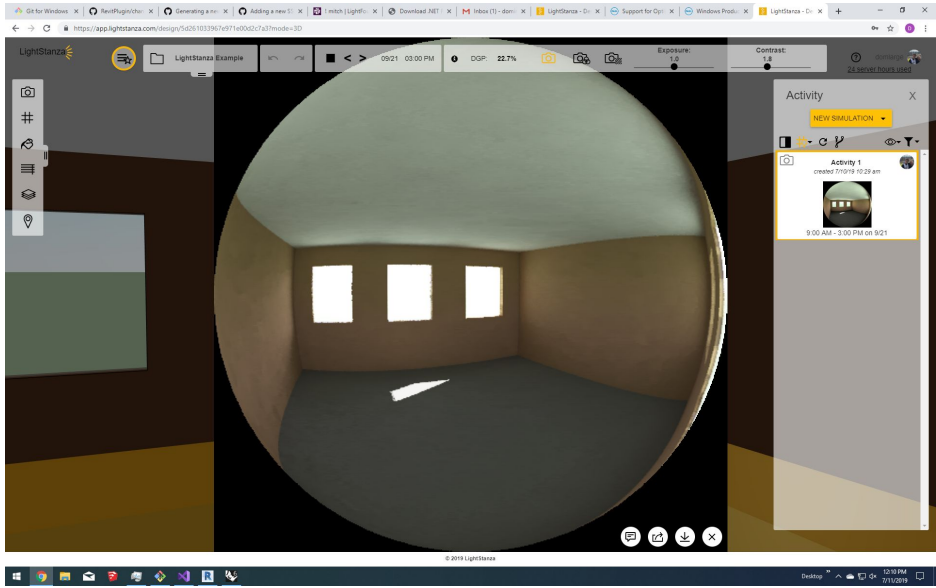

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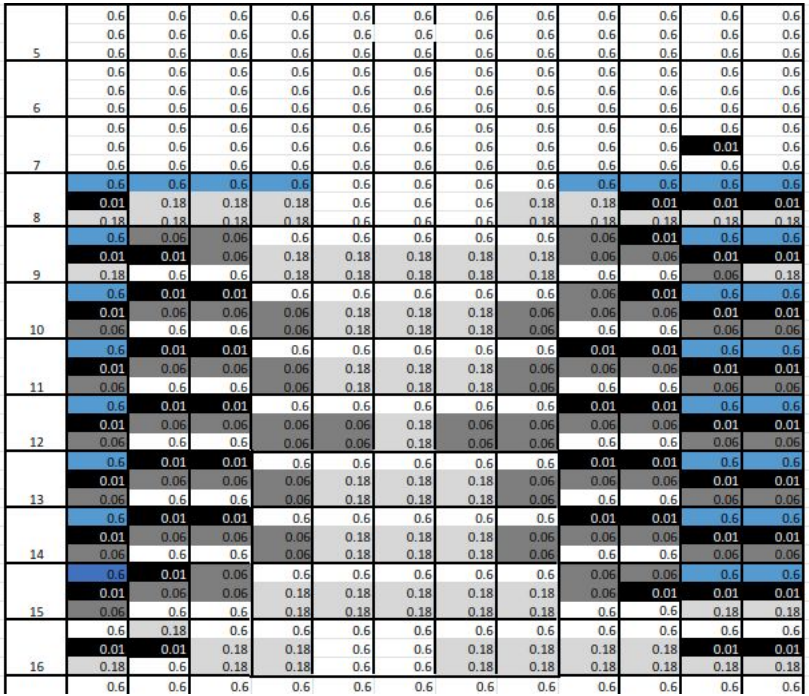
Schedule Comparisons

Grasshopper



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	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.01	0.6
7	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
	0.01	0.18	0.18	0.18	0.6	0.6	0.6	0.18	0.18	0.01	0.01	0.01
8	0.18	0.18	0.18	0.18	0.6	0.6	0.6	0.18	0.18	0.18	0.18	0.18
	0.6	0.06	0.06	0.6	0.6	0.6	0.6	0.6	0.06	0.01	0.6	0.6
	0.01	0.01	0.06	0.18	0.18	0.18	0.18	0.18	0.06	0.06	0.01	0.01
9	0.18	0.6	0.6	0.18	0.18	0.18	0.18	0.18	0.6	0.6	0.06	0.18
	0.6	0.01	0.01	0.6	0.6	0.6	0.6	0.6	0.06	0.01	0.6	0.6
	0.01	0.06	0.06	0.06	0.18	0.18	0.18	0.06	0.06	0.06	0.01	0.01
10	0.06	0.6	0.6	0.06	0.18	0.18	0.18	0.06	0.6	0.6	0.06	0.06
	0.6	0.01	0.01	0.6	0.6	0.6	0.6	0.6	0.01	0.01	0.6	0.6
	0.01	0.06	0.06	0.06	0.18	0.18	0.18	0.06	0.06	0.06	0.01	0.01
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	0.01	0.06	0.06	0.06	0.06	0.18	0.06	0.06	0.06	0.06	0.01	0.01
12	0.06	0.6	0.6	0.06	0.06	0.18	0.06	0.06	0.6	0.6	0.06	0.06
	0.6	0.01	0.01	0.6	0.6	0.6	0.6	0.6	0.01	0.01	0.6	0.6
	0.01	0.06	0.06	0.06	0.18	0.18	0.18	0.06	0.06	0.06	0.01	0.01
13	0.06	0.6	0.6	0.06	0.18	0.18	0.18	0.06	0.6	0.6	0.06	0.06
	0.6	0.01	0.01	0.6	0.6	0.6	0.6	0.6	0.01	0.01	0.6	0.6
	0.01	0.06	0.06	0.06	0.18	0.18	0.18	0.06	0.06	0.06	0.01	0.01
14	0.06	0.6	0.6	0.06	0.18	0.18	0.18	0.06	0.6	0.6	0.06	0.06
	0.6	0.01	0.06	0.6	0.6	0.6	0.6	0.6	0.06	0.06	0.6	0.6
	0.01	0.06	0.06	0.18	0.18	0.18	0.18	0.18	0.06	0.01	0.01	0.01
15	0.06	0.6	0.6	0.18	0.18	0.18	0.18	0.18	0.6	0.6	0.18	0.18
	0.6	0.18	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
	0.01	0.01	0.18	0.18	0.6	0.6	0.18	0.18	0.18	0.18	0.01	0.01
16	0.18	0.6	0.18	0.18	0.6	0.6	0.18	0.18	0.18	0.18	0.18	0.18
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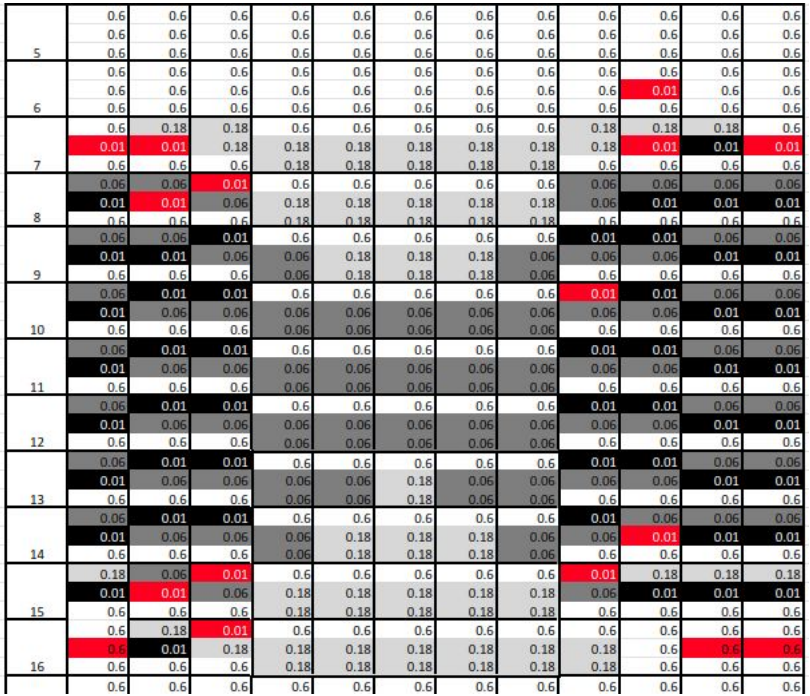
LightStanza



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	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
	0.6	0.18	0.18	0.6	0.6	0.6	0.6	0.6	0.18	0.18	0.18	0.6
7	0.01	0.01	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.01	0.01	0.01
	0.6	0.6	0.6	0.18	0.18	0.18	0.18	0.18	0.6	0.6	0.6	0.6
	0.06	0.06	0.01	0.6	0.6	0.6	0.6	0.6	0.06	0.06	0.06	0.06
8	0.01	0.01	0.06	0.18	0.18	0.18	0.18	0.18	0.06	0.01	0.01	0.01
	0.6	0.6	0.6	0.18	0.18	0.18	0.18	0.18	0.6	0.6	0.6	0.6
	0.06	0.06	0.01	0.6	0.6	0.6	0.6	0.6	0.01	0.01	0.06	0.06
	0.01	0.01	0.06	0.06	0.18	0.18	0.18	0.06	0.06	0.06	0.01	0.01
9	0.6	0.6	0.6	0.06	0.18	0.18	0.18	0.06	0.6	0.6	0.6	0.6
	0.06	0.01	0.01	0.6	0.6	0.6	0.6	0.6	0.01	0.01	0.06	0.06
	0.01	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.01	0.01
10	0.6	0.6	0.6	0.06	0.06	0.06	0.06	0.06	0.6	0.6	0.6	0.6
	0.06	0.01	0.01	0.6	0.6	0.6	0.6	0.6	0.01	0.01	0.06	0.06
	0.01	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.01	0.01
11	0.6	0.6	0.6	0.06	0.06	0.06	0.06	0.06	0.6	0.6	0.6	0.6
	0.06	0.01	0.01	0.6	0.6	0.6	0.6	0.6	0.01	0.01	0.06	0.06
	0.01	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.01	0.01
12	0.6	0.6	0.6	0.06	0.06	0.06	0.06	0.06	0.6	0.6	0.6	0.6
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	0.01	0.06	0.06	0.06	0.06	0.18	0.06	0.06	0.06	0.06	0.01	0.01
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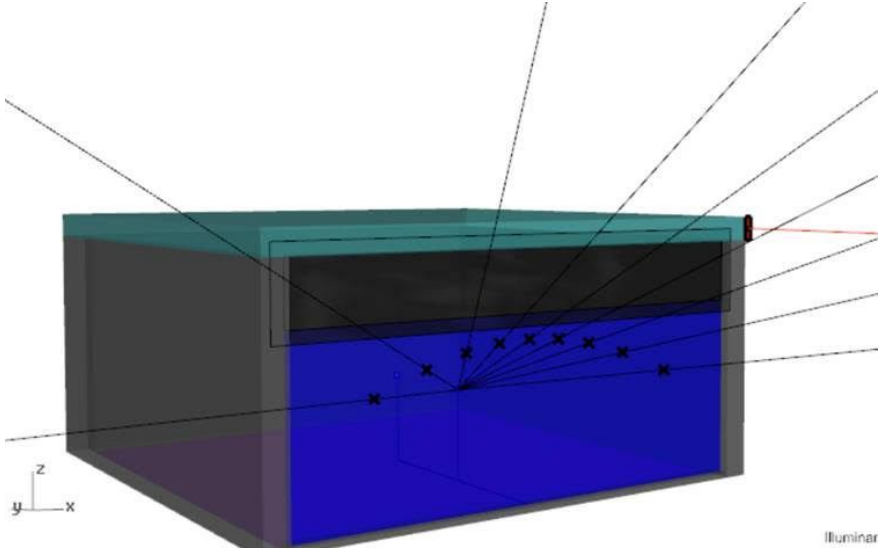
	0.01	0.06	0.06	0.06	0.18	0.18	0.18	0.06	0.06	0.01	0.01	0.01
14	0.6	0.6	0.6	0.06	0.18	0.18	0.18	0.06	0.6	0.6	0.6	0.6
	0.18	0.06	0.01	0.6	0.6	0.6	0.6	0.6	0.01	0.18	0.18	0.18
	0.01	0.01	0.06	0.18	0.18	0.18	0.18	0.18	0.06	0.01	0.01	0.01
15	0.6	0.6	0.6	0.18	0.18	0.18	0.18	0.18	0.6	0.6	0.6	0.6
	0.6	0.18	0.01	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
	0.6	0.01	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.6	0.6	0.6
16	0.6	0.6	0.6	0.18	0.18	0.18	0.18	0.18	0.18	0.6	0.6	0.6
	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6

LightStanza

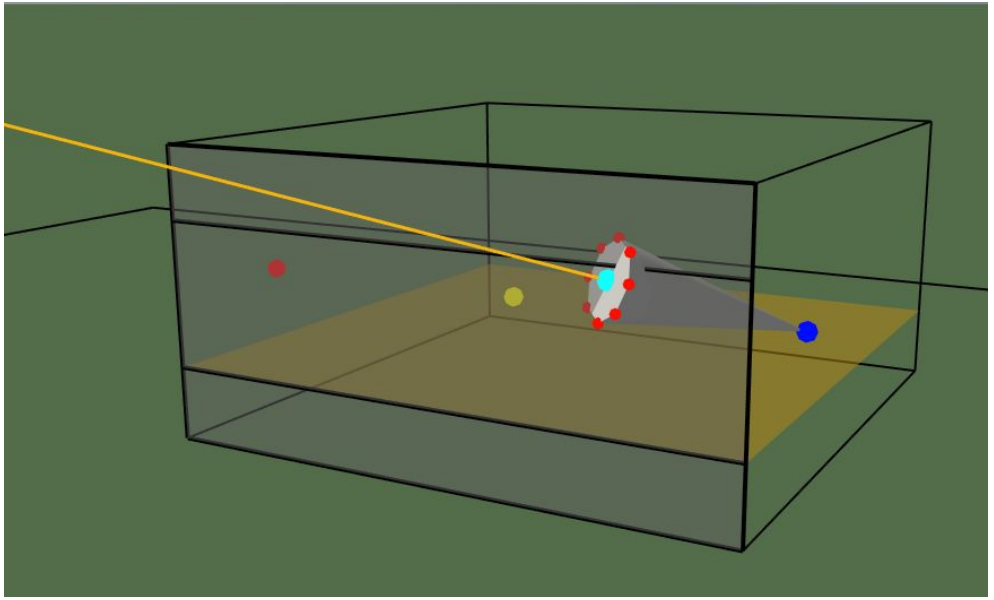
Easier and More Accurate

Grasshopper



1 Glare Test Point + Line Analysis

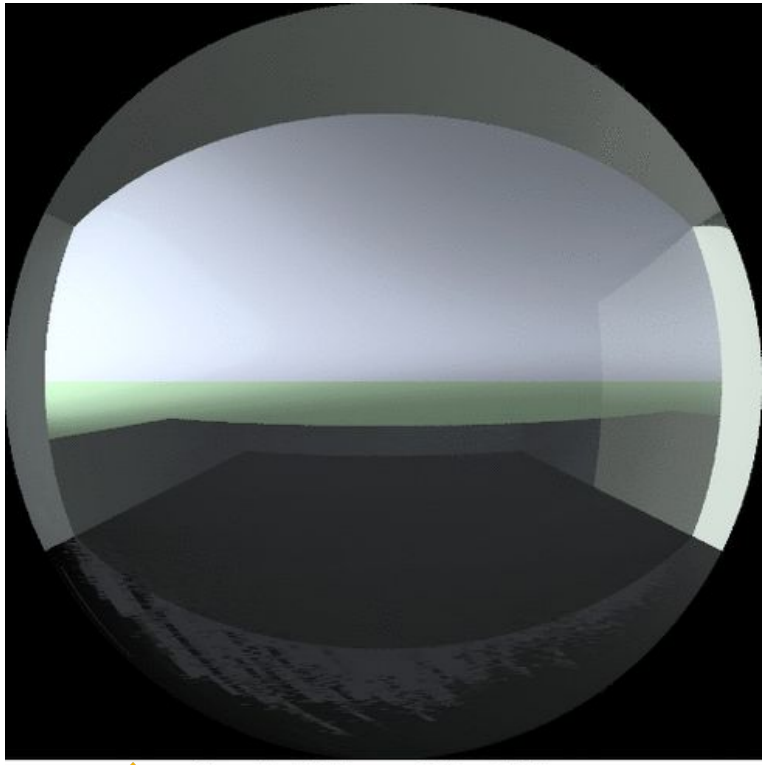
LightStanza



3 Glare Test Points + Cone Analysis

Multi-Zone Optimization Made Easy

Grasshopper



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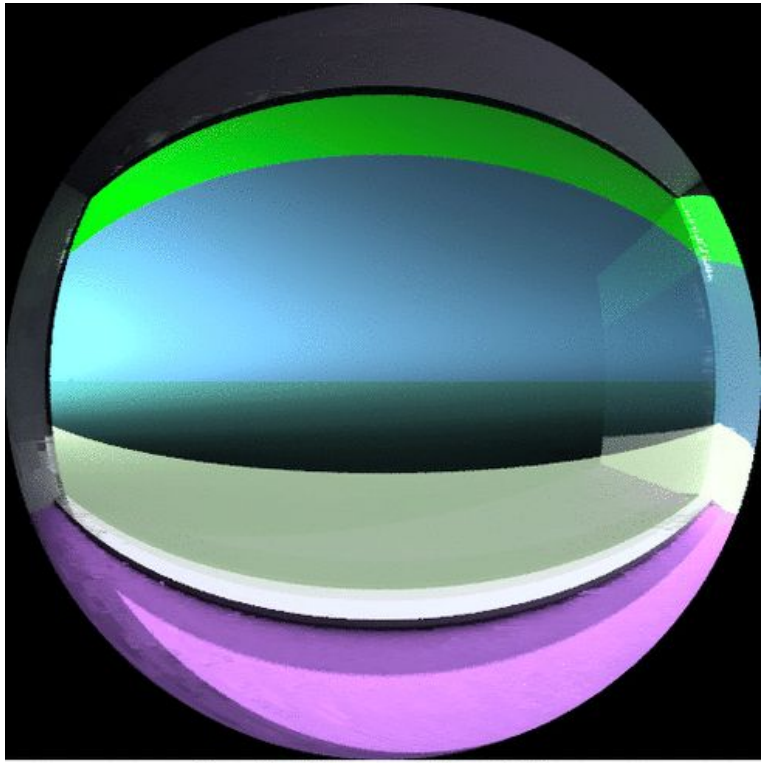


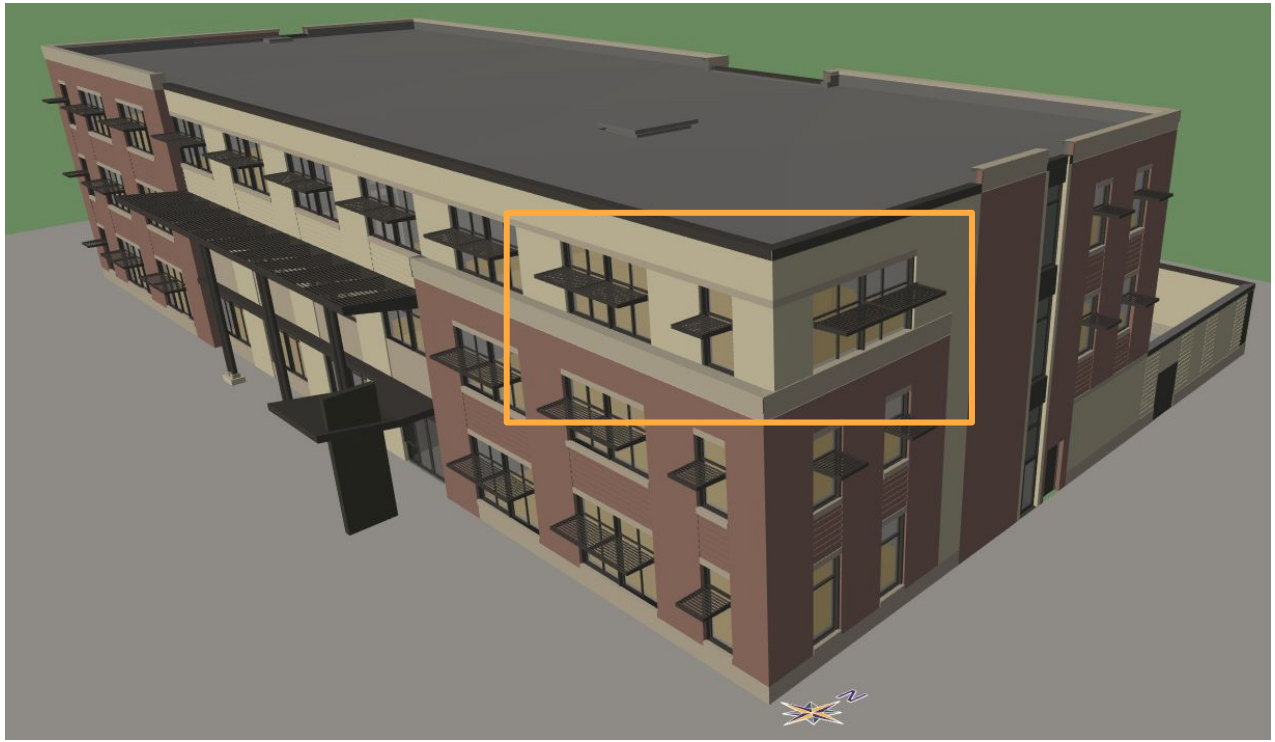
Glare Analysis Example:
Ft. Collins Administration Building, Stantec

Overhangs

USGBC Mountain West Green Building of the Year (2018)

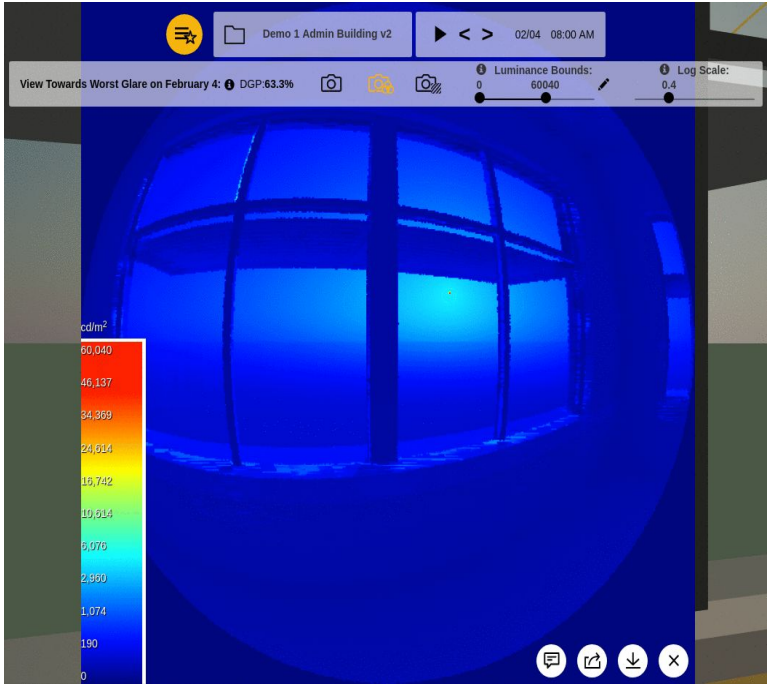
LightStanza

Tracking Winter Glare in a South Facing Office

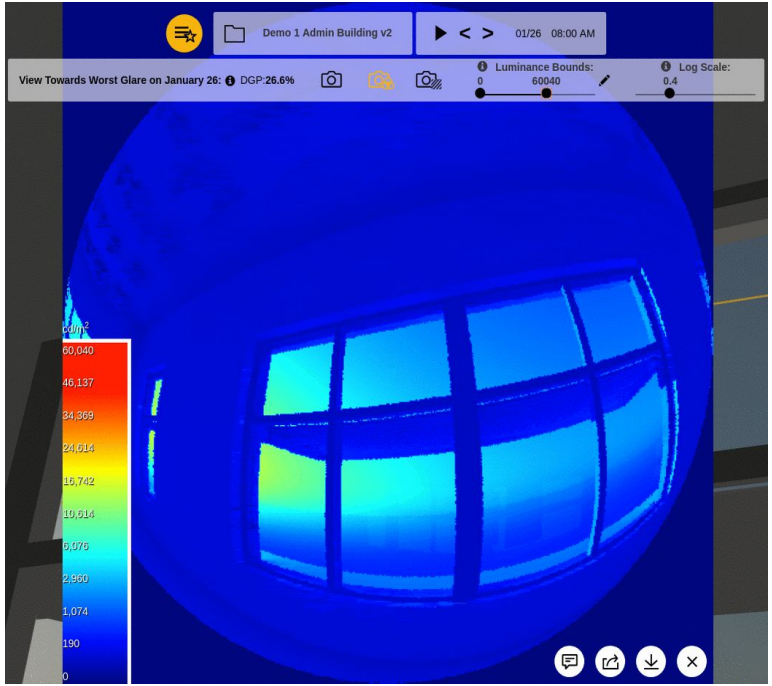


LightStanza

Tracking Winter Glare in a South Facing Office



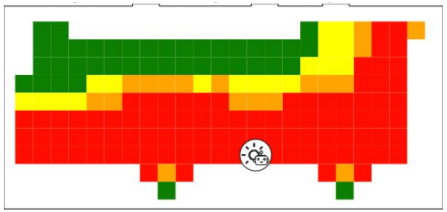
Standard Glass



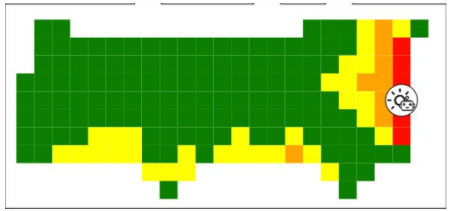
Dynamic Glass

LightStanza

Glare Management Strategies

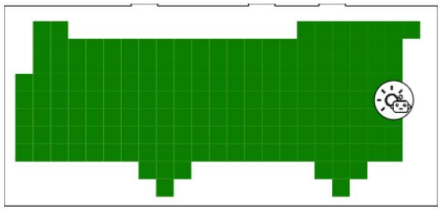


Overhang only

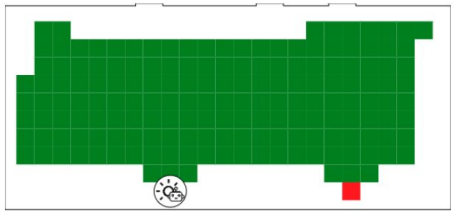


Overhang and
Redirect film

Glare Type	
	Imperceptible
	Perceptible
	Disturbing
	Intolerable



Dynamic Glass



Automated Shades

- Full Year Analysis
- 26 view directions from each grid point

LightStanza

Live Links

Regular glass 3D view: http://app.lightstanza.com/gKw1VJJzq

EC Glass 3D view: http://app.lightstanza.com/dqBX9Nwur

Compare mode: http://app.lightstanza.com/GvAoa849S

Quickly go to model, analysis & simulation parameters, even without a LightStanza account

Daylight Design FAIL:

All blinds are drawn in the middle of the day

LightStanza

Shade Modeling

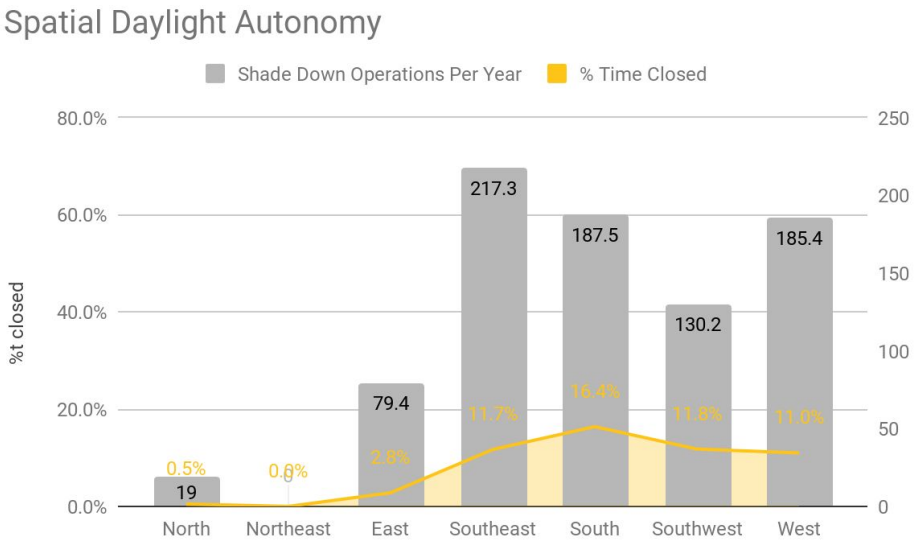
Shades are Automatically Applied to Every Window*

LightStanza

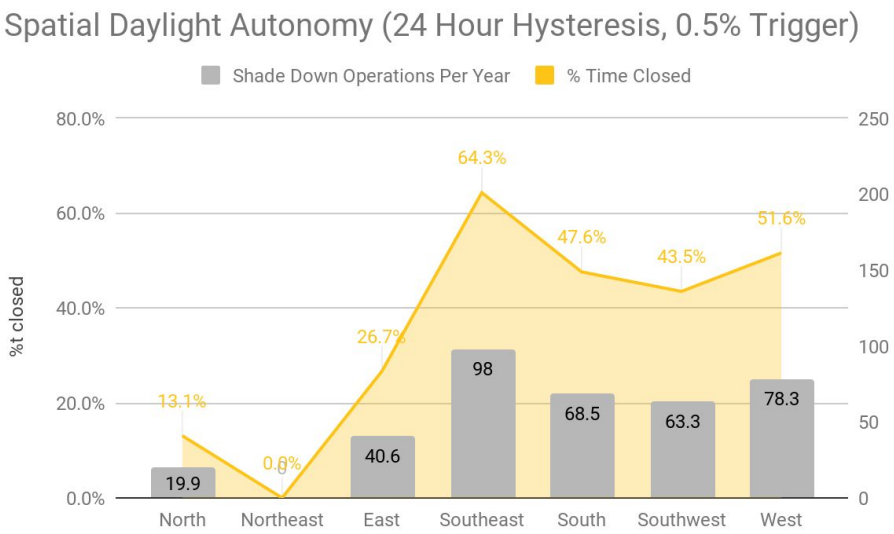
* Can be turned off and adjusted

Active versus Passive Occupant use of Shades

Active



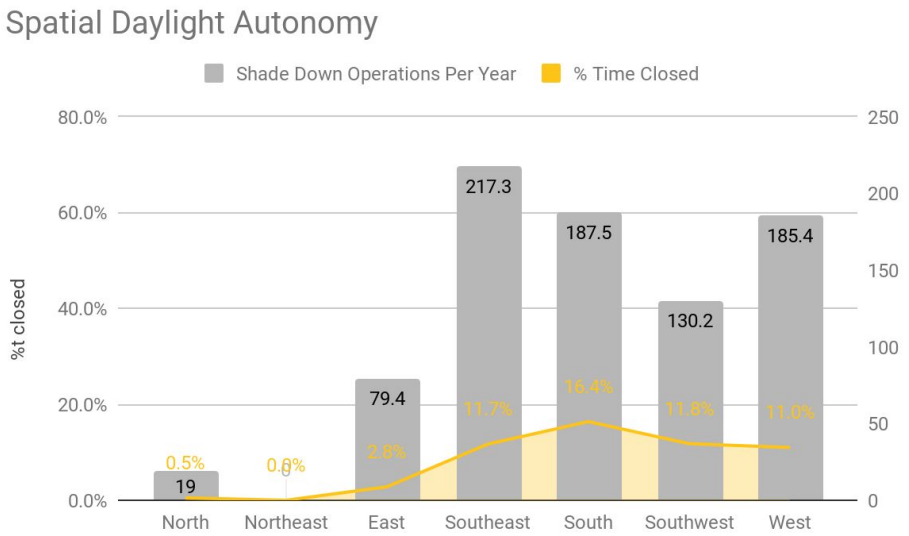
Passive



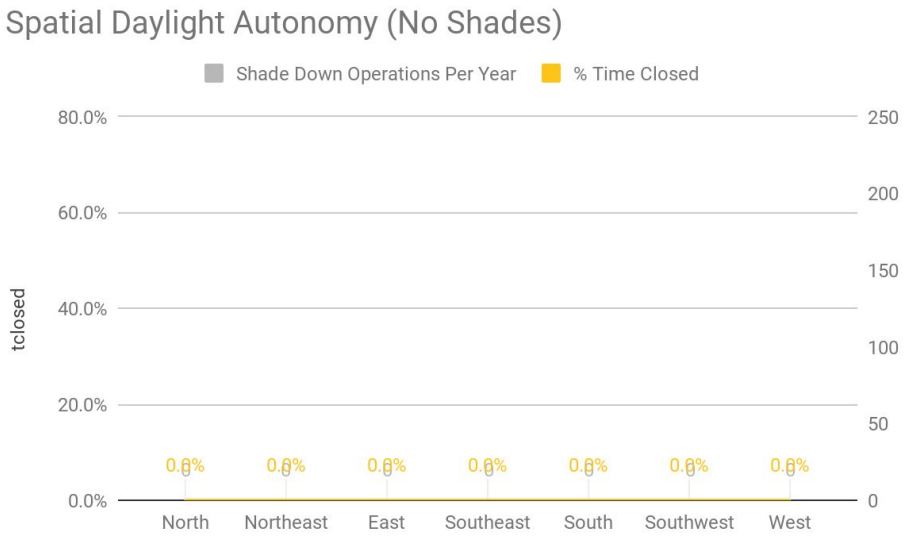
LightStanza

LightStanza Facilitates a Transition to the Standard

Shade IESNA LM-83 Standard



Designing without Shades



LightStanza

LightStanza Provides Raw Report Data

Blinds:

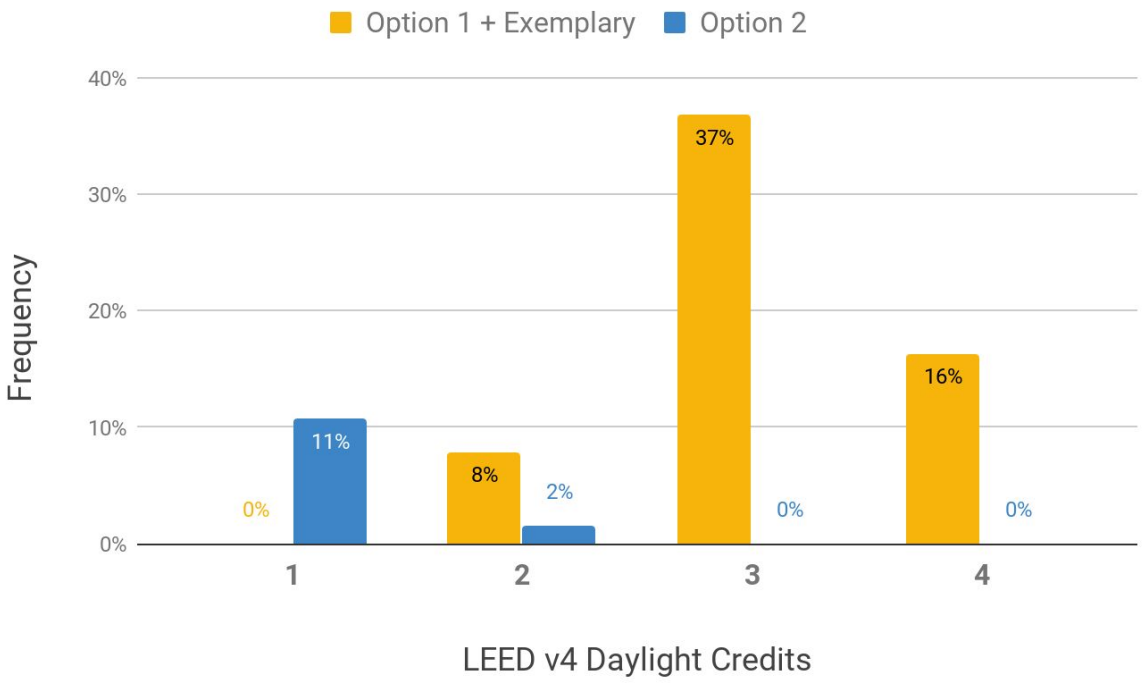
5% Shade White (Dynamic; Offset 1.00 in.; 0.5% Area Trigger; 1,000 lux Direct Sun Trigger)

Blinds Hysteresis: 24 hours

Blinds Summary

	N_{groups}	t_{closed}	N_{down}	N_{up}
North	16	13.1%	19.9	19.9
Northeast	5	0.0%	0.0	0.0
East	14	26.7%	40.6	40.4
Southeast	4	64.3%	98.0	97.0
South	10	47.6%	68.5	67.7
Southwest	13	43.5%	63.3	62.6
West	7	51.6%	78.3	78.0
All	69	32.5%	48.3	48.0

What are Anonymous Usage Analytics?



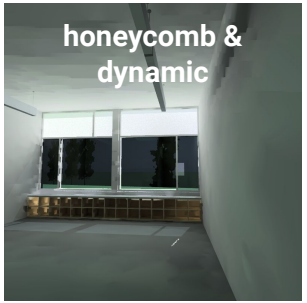
Presented at Greenbuild 2018

LightStanza

Daylight Design Success:
Minimal shade usage by solar control

LightStanza

Comparing Multiple Design Options



LightStanza

Bulk Simulation Results

AVG=2147 lux
DA=93%
ASE=50%
GLARE=56%

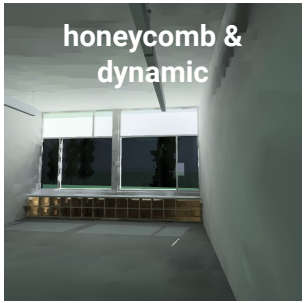
AVG=2145 lux
DA=91%
ASE=14%
GLARE=14%

AVG=2156 lux
DA=73%
ASE=25%
GLARE=0%

Excessive glare

AVG=2557 lux
DA=93%
ASE=27%
GLARE=41%

AVG=3079 lux
DA=94%
ASE=27%
GLARE=62%



AVG=2430 lux
DA=90%
ASE=17%
GLARE=30%

LightStanza

Design Selection

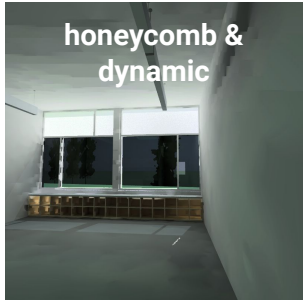
AVG=2147 lux
DA=93%
ASE=50%
GLARE=56%

AVG=2145 lux
DA=91%
ASE=14%
GLARE=14%

AVG=2156 lux
DA=73%
ASE=25%
GLARE=0%

AVG=2557 lux
DA=93%
ASE=27%
GLARE=41%

AVG=3079 lux
DA=94%
ASE=27%
GLARE=62%



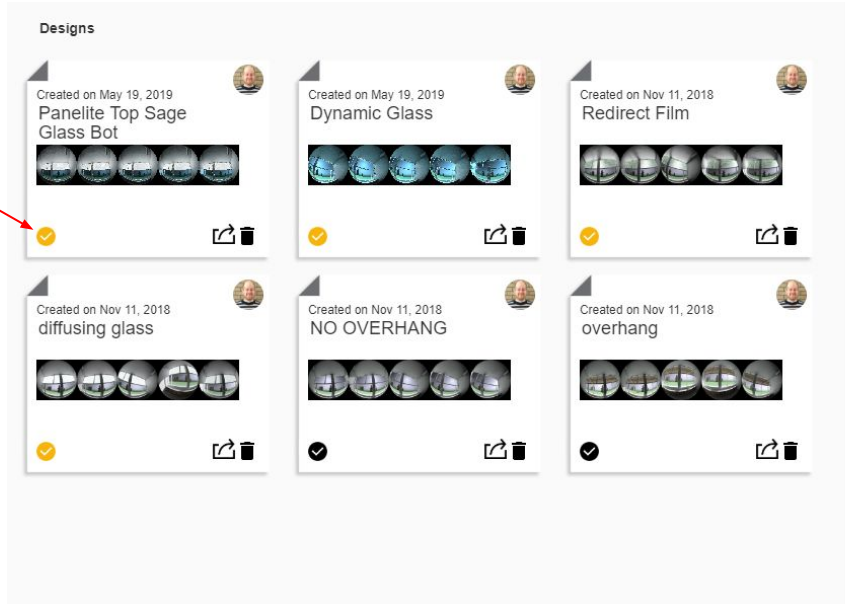
AVG=2430 lux
DA=90%
ASE=17%
GLARE=30%

LightStanza

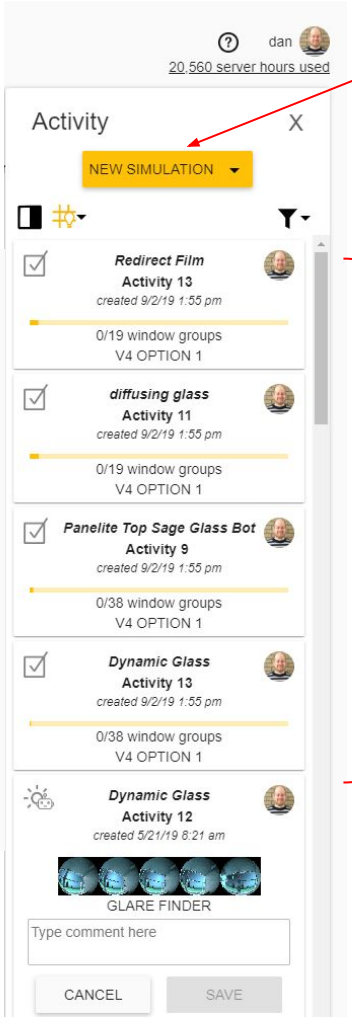
Bulk Simulation Process

1

Select designs



2 Choose simulation type

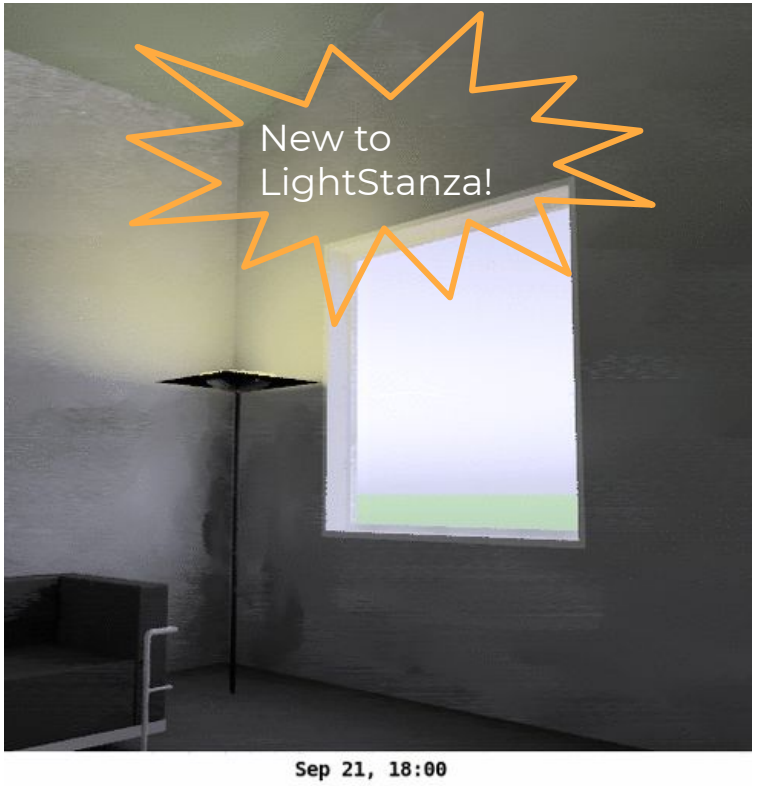


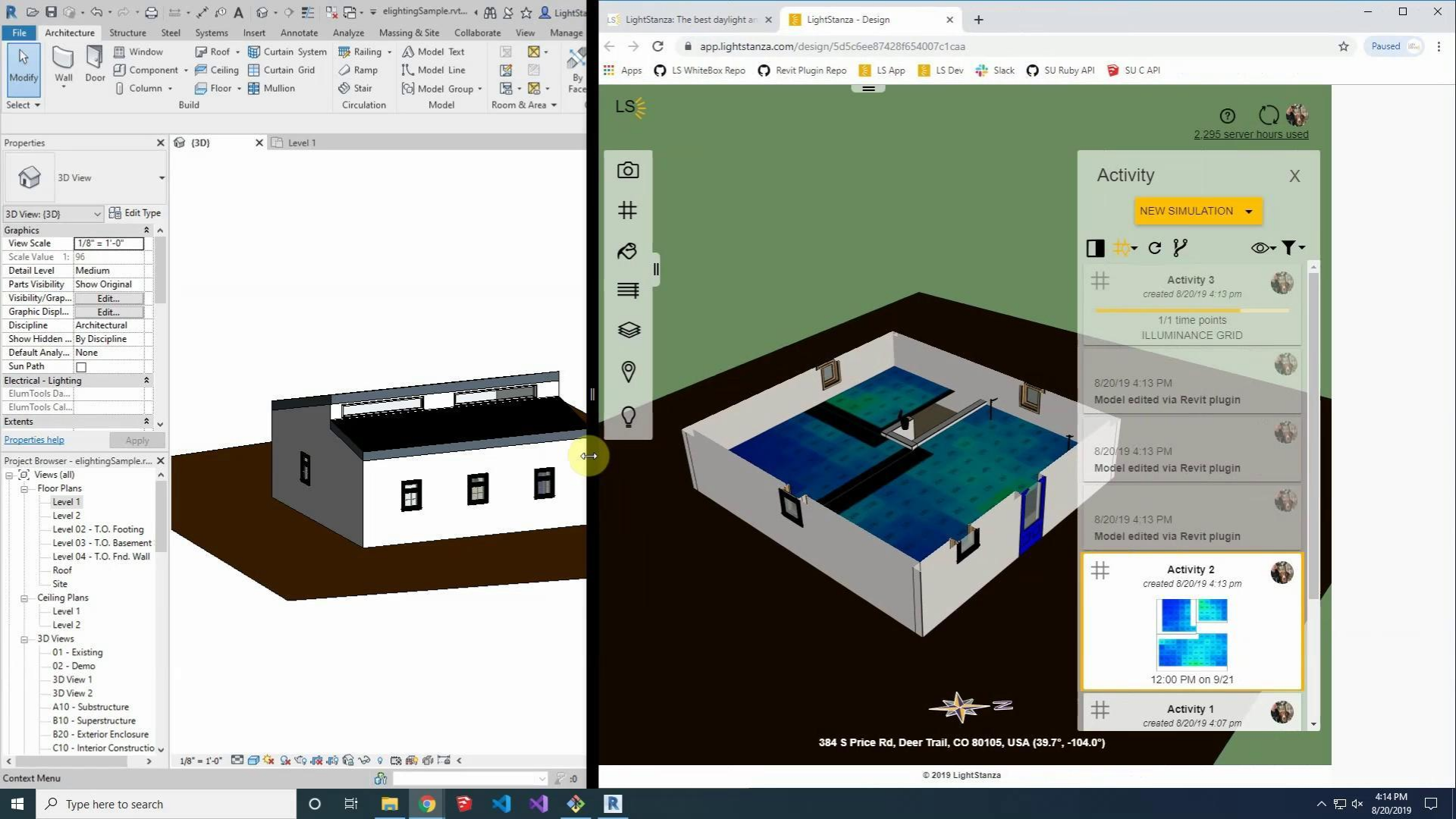
3 Simulations run simultaneously

LightStanza

Electric Light Modeling

- Works Directly with Revit Model
- Luminaries are specified in Revit
- Updates Automatically Synced between Revit → LightStanza
  - Geometry
  - Luminaires
  - Everything Else
- Calculations in LightStanza




File
Architecture
Structure
Steel
Systems
Insert
Annotate
Analyze
Massing & Site
Collaborate
View
Manage
Modify
Wall
Door
Window
Component
Column
Roof
Ceiling
Floor
Curtain System
Curtain Grid
Mullion
Railing
Ramp
Stair
Model Text
Model Line
Model Group
Build
Circulation
Model
Room & Area
Properties
3D View
3D View: {3D}
Edit Type
Graphics
View Scale
1/8" = 1'-0"
Scale Value 1: 96
Detail Level
Medium
Parts Visibility
Show Original
Visibility/Grap...
Edit...
Graphic Displ...
Edit...
Discipline
Architectural
Show Hidden ...
By Discipline
Default Analy...
None
Sun Path
Electrical - Lighting
ElumTools Da...
ElumTools Cal...
Extents
Properties help
Apply
Project Browser - elightingSample.r...
Views (all)
Floor Plans
Level 1
Level 2
Level 02 - T.O. Footing
Level 03 - T.O. Basement
Level 04 - T.O. Fnd. Wall
Roof
Site
Ceiling Plans
Level 1
Level 2
3D Views
01 - Existing
02 - Demo
3D View 1
3D View 2
A10 - Substructure
B10 - Superstructure
B20 - Exterior Enclosure
C10 - Interior Construction
{3D}
Level 1
1/8" = 1'-0"
Context Menu
LightStanza: The best daylight an
LightStanza - Design
app.lightstanza.com/design/5d5c6ee87428f654007c1caa
Paused
Apps
LS WhiteBox Repo
Revit Plugin Repo
LS App
LS Dev
Slack
SU Ruby API
SU C API
LS
2,295 server hours used
Activity
X
NEW SIMULATION
Activity 3
created 8/20/19 4:13 pm
1/1 time points
ILLUMINANCE GRID
8/20/19 4:13 PM
Model edited via Revit plugin
8/20/19 4:13 PM
Model edited via Revit plugin
8/20/19 4:13 PM
Model edited via Revit plugin
Activity 2
created 8/20/19 4:13 pm
12:00 PM on 9/21
Activity 1
created 8/20/19 4:07 pm
N
384 S Price Rd, Deer Trail, CO 80105, USA (39.7°, -104.0°)
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Type here to search
4:14 PM
8/20/2019

Discussion/Questions

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