Daylight Simulation Program

Elements needed for a daylight simulation*

* Reinhart CF, Daylighting course lectures, MIT, 2012
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**Building Information Modeling (BIM):**

Building Information Modeling (BIM) is an intelligent 3D model-based process that equips architecture, engineering, and construction professionals with the insight and tools to more efficiently plan, design, construct, and manage buildings and infrastructure. (https://www.autodesk.com/solutions/bim)
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Advantages:

• No need to have an extra software to communicate between the modelling software and Radiance
• No need to specify scene geometry / optical material properties / space usage / geographical specifications / building orientation
• No need to manually explode and change each solid glass object to a one surface object

Such a tool can be helpful during each step in Architectural design process from the beginning to the end.

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Disadvantage/Weakness:

- At the moment, there is not any possibility to export Revit view specifications to Dynamo
Disadvantage/Weakness:

- No Revit view specifications in Dynamo
- At the moment, there is a problem with unwanted filling the hole in some **closed** Solid Sweep, Swept Blend or Extruded objects (mostly in more complex frames in doors and windows families) in Dynamo
  - Solution is to split them to two objects
Disadvantage/Weakness:

- No Revit view specifications in Dynamo
- Problem with closed Solid Sweep, Swept Blend or Extruded objects in Dynamo
- At the moment, Dynamo has some memory issues for complex models, so it crashes quite often.
  - Solution is to split the model and then export one by one
Disadvantage/Weakness:

- No Revit view specifications in Dynamo
- Problem with closed Solid Sweep, Swept Blend or Extruded objects in Dynamo
- Memory issues for complex models
- Dynamo is not very stable for complex models
- Section box in Revit is not working in Dynamo; hidden objects are also shown in Dynamo when we select the objects by Category, Type or Family Type
Disadvantage/Weakness:

- No Revit view specifications in Dynamo
- Problem with closed Solid Sweep, Swept Blend or Extruded objects in Dynamo
- Dynamo is not very stable for complex models
- Section box is not working in Dynamo; hidden objects are shown in Dynamo
- At the moment, Only one surface can be imported to Revit to be presented as analysis surface, but there is no limitation in Dynamo. However we cannot make a section view in Dynamo
Disadvantage/Weakness:

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- Problem with closed Solid Sweep, Swept Blend or Extruded objects in Dynamo
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However, we cannot make a section view in Dynamo to be able to see the falsecolor surface grid together with all other building elements such as walls, floors, windows, doors, etc.
Disadvantage/Weakness:

- No Revit view specifications in Dynamo
- Problem with closed Solid Sweep, Swept Blend or Extruded objects in Dynamo
- Dynamo is not very stable for complex models
- Section box is not working in Dynamo; hidden objects are shown in Dynamo
- Only one surface can be imported to Revit to be presented as analysis surface
- Analysis Surface grid cannot be offset against the selected Revit surface in Revit, so we cannot see how much the surface grid is above the selected floor in Revit.
For more information about the package and nodes, please go to http://aftabsoft.net/aftab-rad.html
Find Perforation Percentage

Acceptable Radiation = 300 kW/h^2
Maximum = 600 kW/h^2 \rightarrow \text{Minimum Perforation}
Minimum = 100 kW/h^2 \rightarrow \text{Maximum Perforation}

Perforation Range = 0\%-60\%
Glass area = 40\%, 50\%, 60\%
- Translate Revit model into Radiance object (*.rvt to *.rad file)
- Export geographical and orientation information from Revit to Radiance
- Sunlight hours analysis for the whole year
- Find the optimum perforation for each panel
Thank you so much