An interactive methodology for selecting a suitable window design

Elaheh Jalilzadehazhari
September 2016
Outline

The aim of the study
Background
What are the significant impacts of windows?
Problem area
Step 1 in developing the interactive framework
Step 2 in developing the interactive framework
Benefits and difficulties
The of this study

Developing an interactive methodology for selecting a suitable window design

Windows in buildings
- Psychological effects
- Physiological effect
Background

Ref: Windows, History and advices for renovating windows
(In Swedish: Fönster, historik och råd vid renovering), 1988

Ref: www.elitfonster.se, 2016 september
Window design impacts

- Windows
  - Energy performance
    - Heating demand
    - Cooling demand
    - Electricity for lighting
  - Life cycle cost
    - Investment
    - Consumption
    - Maintenance
  - Comfort
    - Light quality
    - Thermal comfort
    - Acoustic

Linnaeus University
Problem area

Linear regression model

\[ \text{Ln- daylight} = 0.011 \text{ Window size} - 0.096 \text{ Glazing system} - 0.089 \text{ Design model} + 5.632 \]

\[ \text{Ln- energy consumption} = 0.015 \text{ Window size} + 0.038 \text{ Glazing system} - 0.004 \text{ Design model} - 0.129 \text{ Orientation} + 2.802 \]
Benefits and difficulties

Benefits
• Considering the all window design impacts
• Analyzing a large number of window design configurations
• Considering occupants preferences
• Finding a trade-off solution

Difficulties
• Time consuming process
• Requires in depth knowledge in optimization and decision making
Thank you