Occupant behaviour and robustness of building design - DTU Orbit (08/11/2017)

Occupant behaviour and robustness of building design

Occupant behaviour can cause major discrepancies between the designed and the real total energy use in buildings. A possible solution to reduce the differences between predictions and actual performances is designing robust buildings, i.e. buildings whose performances show little variations with alternating occupant behaviour patterns. The aim of this work was to investigate how alternating occupant behaviour patterns impact the performance of different envelope design solutions in terms of building robustness. Probabilistic models of occupants' window opening and use of shading were implemented in a dynamic building energy simulation tool (IDA ICE). The analysis was carried out by simulating 15 building envelope designs in different thermal zones of an Office Reference Building in 3 climates: Stockholm, Frankfurt and Athens.In general, robustness towards changes in occupants' behaviour increased with increasing thermal mass and with decreasing transparent area of the envelope. The importance of the robustness' evaluation is highlighted in this paper, in order to obtain optimized buildings' designs for more accurate and realistic energy predictions.

General information

State: Published
Organisations: Department of Civil Engineering, Section for Indoor Climate and Building Physics, Politecnico di Torino
Authors: Buso, T. (Ekstern), Fabi, V. (Ekstern), Andersen, R. K. (Intern), Corgnati, S. P. (Ekstern)
Number of pages: 10
Pages: 694-703
Publication date: 2015
Main Research Area: Technical/natural sciences

Publication information

Journal: Building and Environment
Volume: 94
ISSN (Print): 0360-1323
Ratings:
BFI (2017): BFI-level 1
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 4.51 SJR 2.015 SNIP 2.198
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 2.093 SNIP 2.49 CiteScore 4.37
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 1.938 SNIP 2.797 CiteScore 4.14
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 1.581 SNIP 2.602 CiteScore 3.57
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 1.331 SNIP 2.875 CiteScore 3.06
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): SJR 1.144 SNIP 2.255 CiteScore 2.76
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 1.235 SNIP 2.001
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 1
Scopus rating (2009): SJR 1.028 SNIP 1.865
Web of Science (2009): Indexed yes
BFI (2008): BFI-level 1
Scopus rating (2008): SJR 0.924 SNIP 1.38

Web of Science (2008): Indexed yes
Scopus rating (2007): SJR 0.788 SNIP 1.778
Web of Science (2007): Indexed yes
Scopus rating (2006): SJR 1.03 SNIP 1.63
Scopus rating (2005): SJR 0.955 SNIP 1.225
Web of Science (2005): Indexed yes
Scopus rating (2004): SJR 0.548 SNIP 1.266
Scopus rating (2003): SJR 0.948 SNIP 0.921
Web of Science (2003): Indexed yes
Scopus rating (2002): SJR 0.998 SNIP 1.39
Web of Science (2002): Indexed yes
Scopus rating (2001): SJR 0.777 SNIP 1.098
Scopus rating (2000): SJR 0.526 SNIP 1.14
Scopus rating (1999): SJR 0.564 SNIP 1.175
Original language: English
Occupant behaviour, Buildings design, Robustness, Building energy performance, Probabilistic modelling
DOIs:
10.1016/j.buildenv.2015.11.003
Source: FindIt
Source-ID: 2287835123
Publication: Research - peer-review › Journal article – Annual report year: 2015