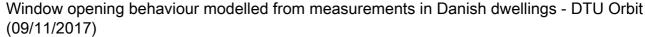
brought to you by



Window opening behaviour modelled from measurements in Danish dwellings

A method of defining occupants' window opening behaviour patterns in simulation programs, based on measurements is proposed.Occupants' window opening behaviour has a strong effect on indoor environment and the energy consumed to sustain it. Only few models of window opening behaviour exist and these are solely based on the thermal indoor/outdoor environment. Consequently, users of simulation software are often left with little or no guidance for the modelling of occupants' window opening behaviour, resulting in potentially large discrepancies between real and simulated energy consumption and indoor environment. Measurements of occupant's window opening behaviour were conducted in 15 dwellings in Denmark during eight months. Indoor and outdoor environmental conditions were monitored in an effort to relate the behaviour of the occupants to the environmental conditions. The dwellings were categorized in four groups according to ventilation type (natural/mechanical) and ownership (owner-occupied/rented) in order to investigate common patterns of behaviour. Logistic regression was used to infer the probability of opening and closing a window. The occupants' window opening behaviour was governed by different but distinct habits in each dwelling. However, common patterns were also identified in the analysis: Indoor CO2 concentration (used as indicator of indoor air quality) and outdoor temperature were the two single most important variables in determining the window opening and closing probability, respectively. The models could be implemented into most simulation programs, which would enable a better chance of mimicking the behaviour of the occupants in the building and thus simulating the indoor environment and energy consumption correctly. © 2013 Elsevier Ltd.

General information

State: Published

Organisations: Department of Civil Engineering, Section for Indoor Environment, Polytechnic University of Turin Authors: Andersen, R. K. (Intern), Fabi, V. (Ekstern), Toftum, J. (Intern), Corgnati, S. P. (Ekstern), Olesen, B. W. (Intern)

Pages: 101-113 Publication date: 2013

Main Research Area: Technical/natural sciences

Publication information

Journal: Building and Environment

Volume: 69

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, Building controls, Adaptation, Window opening, Building energy performance simulation, Air quality DOIs:

10.1016/j.buildenv.2013.07.005

Source: dtu

Source-ID: n::oai:DTIC-ART:compendex/391889242::31911

Publication: Research - peer-review > Journal article - Annual report year: 2013