Autor(en) des Beitrags: 
van Treeck, C.; Frisch, J.; Pfaffinger, M.; Rank, E.; Paulke, S.; Schweinfurth, I.; Schwab, R.; Hellwig, R.; Holm, A.

Titel des Beitrags: Integrated thermal comfort analysis using a parametric manikin model for interactive real-time simulation

Abstract: Following the work of Fiala we developed and tested a parametric multi-segment manikin model as the interface between Fiala's human thermoregulation model and other computational codes for studying transient and local effects of thermal sensation and comfort perception. The model allows for motion control by transforming body parts according to an armature model which relates topological dependencies. The position of joints and decomposition into segments is chosen in terms of the settings of Fiala's model. Several faceted geometric models are available such as the NASA MSIS Standard or predefined NASTRAN geometries. The developed thermoregulation interface provides means to computational steering, i.e. to interact with an ongoing simulation. The boundary conditions, the type of clothing, or the activity level can be modified online, results are updated on a real time scale during the simulation. The visualization on the artificial skin of the manikin includes the surface/skintemperatures and the local thermal sensation votes (LTSV); likewise the predicted mean vote (PMV) and the dynamic thermal sensation (DTS) are output. The LTSV data are based on experimental data which were obtained in a test chamber involving 24 test subjects for three levels of clothing insulation and a light level of activity.

Zeitschriftentitel:
Journal for Building Performance Simulation

Jahr: 2009

Band: in press

Occurences:

- Einrichtungen > Fakultäten > Ingenieurfakultät Bau Geo Umwelt > Lehrstühle > Leonhard Obermeyer Center > Lehrstuhl für Computation in Engineering (Prof. Rank) > Artikel

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