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Determination of the Thermally Comfortable Air Temperature with Consideration of Individual Clothing and Activity as Preparation for a New Smart Home Heating System

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Abstract : The aim of this paper is to determine a thermally comfortable air temperature in an automated living room. This calculated temperature should serve as input for a user-specific and dynamic heating control in such a living space. In addition to the usual physical factors (air temperature, humidity, air velocity, and radiation temperature), individual clothing and activity should be taken into account. The calculation of such a temperature is based on different methods and indices which are usually used for the evaluation of the thermal comfort. The thermal insulation of the worn clothing is determined with a Radio Frequency Identification system. The activity performed is only taken into account indirectly through the generated heart rate. All these methods are ultimately very well suited for use in temperature regulation in an automated home, but still require further research and extensive evaluation.

Keywords : smart home, thermal comfort, predicted mean vote, radio frequency identification
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