The Fuzzy Logic Modeling of Performance Driver Seat's Localised Cooling and Heating in Standard Car Air Conditioning System

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Abstract : In this study, performance of the driver seat's localized cooling and heating in a standard car air conditioning system was experimentally investigated and modeled with Rule-Based Mamdani-Type Fuzzy (RBMTF) modeling technique. Climate function at automobile is an important variable for thermal comfort. In the experimental study localized heating and cooling performances have been examined with the aid of a mechanism established to a vehicle. The equipment's used in the experimental setup/mechanism have been provided and assembled. During the measurement, the status of the performance level has been determined. Input parameters revolutions per minute and time; output parameters car seat cooling temperature, car back cooling temperature, car seat heating temperature, car back heating temperature were described by RBMTF if-the rules. Numerical parameters of input and output variables were fuzzificated as linguistic variables: Very Very Low (L1), Very Low (L2), Low (L3), Negative Medium (L4), Medium (L5), High (L7), Very High (L8) and Very Very High (L9) linguistic classes. The comparison between experimental data and RBMTF is done by using statistical methods like absolute fraction of variance (R^2). The actual values and RBMTF results indicated that RBMTF could be successfully used in standard car air conditioning system.

Keywords : air conditioning system, cooling-heating, RMBTF modelling, car seat