

A Fuzzy Control Design Flow for the Temperature Inside an Enclosure

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Abstract— The fuzzy control design flow is assigned as being much faster than other conventional control strategies. However, many procedures and steps of classical algorithms could greatly improve the results in term of wide robustness of the fuzzy solution. Therefore, in this study are followed not only the standard features of the fuzzy control but are also considered some identification, modeling and simulation elements. From this stage to the programming tools of the control systems, several intermediate steps allow a partial checking and monitoring of the solutions and of the tools put into operation. The design results are verified by a virtual environment closed to the real conditions for the hardware platform. Then, the real-time results obtained with the experimental hardware system certify the quality of the design stage. For a fast and efficient design, most of the acquisition, control and peripheral boards are taken from a modular, ready to use family. In order to exploit all the software and hardware facilities support some extra board, locally designed, were added. The enclosure uses a thermoelectric element that is able to realize the heating or the cooling by means of a special power supply. The functionality aspects and the quality results are proved also by several on-line recordings. The study and the solutions allow a fast implementation of different kind of control algorithms, both in a professional and in a pedagogical environment.