عنوان مقاله:

A fuzzy inference expert system for detecting and controlling the rice weeds

محل انتشار:

هفتمین کنگره بین المللی مهندسی برق، کامپیوتر و مکانیک (سال: 1401)

تعداد صفحات اصل مقاله: 29

نویسندگان:

Najmeh Fatahi Nafchi - *MA student in E-commerce, Safahan Institute of Higher Education, Isfahan, Iran*

Adeleh Asemi - *Department of Software Engineering Faculty of Computer Science and Information Technology, University of Malaya, KL, Malaysia*

Asefeh Asemi - *Doctoral School of Economics, Business, & Informatics, Corvinus University of Budapest, Fovam ter ۸., ۱۰۹۳, Budapest, Hungary*

خلاصه مقاله:

The purpose of the present study was to design a fuzzy expert system for detecting and controlling the rice weed. The statistical population of the respondents was elites and experts with regard to the science, experience and field of activity in the field (the faculty members of the department of the agriculture and agricultural engineers). In this study, ۱۵ experts were selected as the sample. In this study, two questionnaire forms were used to design a fuzzy expert system for the detection and controlling the weeds: A) Fuzzy Delphi Technique Weed detection Questionnaire, B) Delphi Technique Weed Control Questionnaire. The design of the desired expert system was done with MATLAB software and the fuzzy logic tool box of this software. That is, after obtaining an appropriate range of factors, through attributing the fuzzy trapezoidal membership functions to these ranges and generating the input functions, designing the rule base of this system and combining the output results of each factor, a system is designed whose input is the weed factor and the output is the scores assigned to the weeds. The MATLAB guide is also used to design the graphical user interface. Then, for validation the designed system was tested. The answers of system and individual expert were then analyzed using paired t-test in SPSS software. Root Mean Square Error (RMSE) and Middle Absolute value Deviation (MAD) tests were used to calculate the system errors . The results were۰.۱۲, and ۰.۰۱, respectively. This indicates that the fuzzy expert system designed in this study has sufficientaccuracy in replacing an individual expert. Finally, given that all but two of the examined rules are the sameas the diagnosis of an individual expert, it can be concluded that in ۹۴% of the cases, the diagnosis of thesystem is the same as the diagnosis of an individual expert

کلمات کلیدی:

. Fuzzy Expert System, Diagnosis, Control, Rice Weed, Mamdani Inference