

A Comprehensive Study on Making Food Using Rice Cooker with Fuzzy Logic Technique

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Abstract:-The Rice Cooker features with advanced logic technology, which allows it to think for itself and make adjustments to the temperature and timing of batch of rice totally on the cooking. A spherical inner cooking pan and heating system distributes heat evenly so the rice at the bottom is the same consistency.

Index terms: Time, automatic temperature, fuzzy logic control system.

INTRODUCTION:

It'll do brown rice, white rice, even oatmeal. For nights you need not want to wait, a quick cook program will make white rice in just 15 minutes, exactly the amount of time it'll take you to make a stir fry out of all those vegetables in your crisper and that leftover rotisserie chicken.

In this cooker as we set the time for cooking the cooker itself set the temperature automatically. Fuzzy logic is a form of knowledge representation suitable for notions that cannot be defined precisely, but which depend upon their contexts. Fuzzy control is based on fuzzy logic a logical system which is closer in spirit to human thinking and natural language than traditional logical systems.

Objectives:

The visualization of the selection process of the crisp output value, from the output fuzzy set, as a result of the inference operation.

Proposed:

The goal is to create a fuzzy logic controller for a rice cooker, as we give the time that it will compute the appropriate cooking time and it automatically sets the temperature.

Product Specifications:

Ultra-intelligent rice cooker thinks for itself ,makes adjustments to temperature and cooking time ,Makes white rice, brown rice, sushi rice, even oatmeal, spherical inner cooking pan distributes heat evenly ,automatically keeps rice warm after cooking is done

RELATED WORK:

Fuzzy control is based on fuzzy logic a logical system which is closer in spirit to human thinking and natural language than traditional logical systems. Fuzzy logic control system is based on fuzzy logic provides means of linguistic control

strategy based on expert knowledge into an automatic control strategy.

Crisp set is defined in such a way that all individuals in a given universe can be partitioned into tow classes that those who belong to the set and those who do not belong to the set.

The input variables in a fuzzy control system are in general mapped by sets of membership functions similar to this, known as "fuzzy sets". The process of converting a crisp input value to a fuzzy value is called "fuzzification".

Currently Used Fuzzy Controllers:

Flight control System,
Camcorder stabilization

Why Should We Use Fuzzy Controllers?

Very robust
Can be easily modified
Can use multiple inputs and output sources
Very quick and cheaper to implement

Creating the fuzzy logic control system for the control of rice cooker:

The goal is to create a fuzzy logic controller for a rice cooker, as we give the time that it will compute the appropriate cooking time and it automatically sets the temperature, based on certain information about the rice and water that are to be cook. A schematic view of this system is deployed in the figure below:

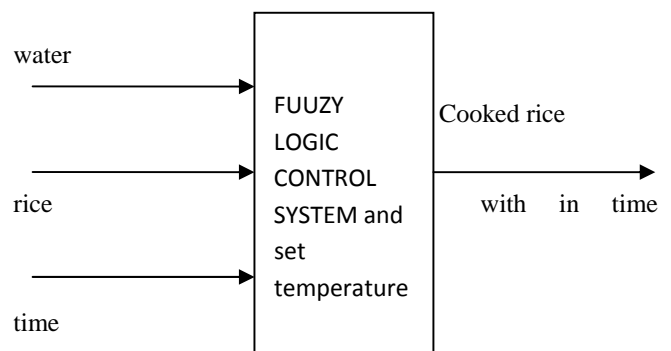


Fig: Fuzzy logic control system

PROCEDURE:

1. Start.
2. Add the rice and water to the cooker.
3. Set the time **tim** for cooking and it automatically set the temperature **temp** from the fuzzy sets.
4. Sensor system collects the data and sends them to the controller.
5. Fuzzy logic control system controls the controller system
6. Output: cooking is over and automatically keeps rice warm after cooking is done.
7. End.

ALGORITHM:

Input:

Water ,rice, time.

Process:

If(**tim==15 min**) then
 Select **temp=100 degrees**

Else if(**tim==30 min**) then
 Select **temp=75 degrees**

Else if(**tim==45 min**) then
 Select **temp=50 degrees**

else(**tim==1 hrs**) then
 Select **temp=30 degrees**

Output:

Cooked rice with in time

Interrupt occurs:

If power off then
 Start from the resume time.

If voltage is low we can use stabilizers.

For example: if we set the time at 15min it takes the temperature as 100 degrees. Cooking starts, if after 5min if power off, and after power comes it resumes from the 5minutes (remaining 10min) at temp 100degrees.

Disadvantage: Failure to use for the fried items.

Process control using Fuzzy logic control system:

Building a rice cooker with automatic temperature determination means building the following two subsystems:

- *the sensor system* - collects data and send them to the controller
- *the controller system* - sets the cooking time, based on the information received from the sensor system sets the temperature. Given the fact that there is no mathematical relation between the inputs and output, a "**fuzzy logic controller**" will be used.

In this we use five fuzzy sets:

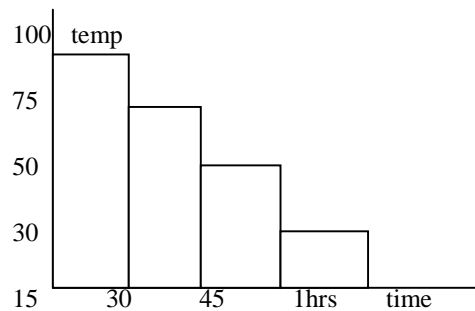
They are **very low, low, medium, high, and very high**. As we set the time it automatically selects the temperature from the given fuzzy sets.

Unfortunately, a precise mathematical relation between the inputs and the output cannot be defined. Thus, the cooking time is manually set by the user, as the user sets the time the controller system automatically selects the temperature.

For example as we give the time as one hour, it takes the temperature as very low. If not as we give the time as 45 min, it takes the temperature as low, if not as we give the time as 30 min, it takes the temperature as medium, if not as we give the time as 20 min, it takes the temperature as high, if not as we give the time as 15 min hour, it takes the temperature as very high.

Parameters of the fuzzy sets

- Very low [0 to 20 temp]
- Low [21 to 30 temp]
- Medium [31 to 50 temp]
- High [51 to 75 temp]
- Very high [76 to 100 temp]



The operations of the fuzzy logic control system are fuzzification - turns the crisp input into a singleton fuzzy set
 defuzzification - centroid (COA - center of area)

CONCLUSION:

Rice cooker with Fuzzy Logic technology will be better than the other rice cookers that it saves the user's time, and the work will be done in time.

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