Assignment 4

Due Date: 11/28/2017

Total Points: 50

In this exercise, you will implement a fuzzy inference system (FIS) with your project team members (or individually) using an existing fuzzy logic toolbox of your choice. The dataset choice can be based on your final project or something else but needs to be described. Please provide the following details about your implementation. You should come up with at least four measurable quantities (i.e. inputs and outputs), and at least six inference rules that would relate your outcomes to the fuzzy sets. An example of the fuzzy membership functions for the variable speed can be "slow", "medium" and "fast". For each question below, please provide snapshots of the FIS for each of the following questions

1. Membership functions:

    a. Define a set of membership functions for each input variable that seem applicable to your problem domain.

    b. Define a set of membership functions for each output variable that seem applicable to your problem domain.

2. Fuzzy Rules:

    a. Generate a set of rules that map the input and output membership functions.

3. Testing with Sample Data points:

    a. Test the FIS using at least 2-3 different inputs that explain the FIS performance.

    b. Test the FIS using the same inputs from 3a using a different membership function for the inputs i.e. if you used a Gaussian function, test with triangular function or something else. Does the performance change significantly?

    c. Test the FIS with the same inputs from 3a by changing the FIS with a different AND or an OR operator. As an example, you can change the "min" operator with the product or some other choice from the toolbox. Again compare the performance.

    d. Test the FIS using the same inputs from 3a with a different defuzzification operator. How does this change the output?

For each question in 3, the analysis should not be more than 2-3 sentences at most.

Please make sure to submit a zipped file containing the code and report (in pdf) in the Dropbox folder titled "Assignment 4"on Pilot.

Academic Integrity

Discussion of course contents with other students is an important part of the academic process and is encouraged. However, it is expected that course programming assignments, homework assignments, and other course assignments will be completed on an individual basis (unless specified otherwise). Students may discuss general concepts with one another, but may not, under any circumstances, work together on the actual implementation of any course assignment. If you work with other students on "general concepts" be certain to acknowledge the collaboration and its extent in the assignment. Unacknowledged collaboration will be considered dishonest. "Code sharing" (including code from previous quarters) is strictly disallowed. "Copying" or significant collaboration on any graded assignments will be considered a violation of the university guidelines for academic honesty.

If the same work is turned in by two or more students (outside the teams), all parties involved will be held equally accountable for violation of academic integrity. You are responsible for ensuring that other students do not have access to your work: do not give another student access to your account, do not leave printouts in the recycling bin, pick up your printouts promptly, do not leave your workstation unattended, etc. If you suspect that your work has been compromised notify me immediately. If you have any questions about collaboration or any other issues related to academic integrity, please see me immediately for clarification. In addition to the policy stated in this syllabus, students are expected to comply with the Wright State University Code of Student Conduct (http://www.wright.edu/students/judicial/conduct.html) and in particular the portions pertaining to Academic Integrity (http://www.wright.edu/students/judicial/integrity.html) at all times.