CISC-490 and CISC-870

Winter 2017

Assignment

Due April 7, 2017

1. As a service to those who celebrate St. Valentine's Day, you are asked to create a set of fuzzy rules to evaluate any movie's membership in the fuzzy set "Intelligent and Romantic Movies". You should identify at least four measurable aspects of movies and fuzzy sets to which they can belong. You should come up with at least five rules.

   For example, two of your rules might be

   "If Number_Of_Explosions is not Low and Number_of_Quiet_Conversations is Low, then Intelligent_and_Romantic is Low"

   and

   "If Year_In_Which_Movie_Takes_Place is Historical and Number_of_Times_Main_Characters_Are_Separated is High, then Intelligent_and_Romantic is High"

   If you don't feel like rating romantic movies, please feel free to substitute a different genre of your choice.

2. Choose a t-norm **other than t(x,y) = min(x,y)**, and discuss a practical application from the literature in which this t-norm is used.

3. Discuss an example of a situation in your daily life where you (perhaps without realizing it at the time) have applied fuzzy logic to make decisions.

4. Let C be a closed simple curve in the plane (that is, C is the result of putting a pen on a sheet of paper, then drawing a line that ends where it started and never crosses itself).

   A perfect circle is easy to define: C consists of all points in the plane that are exactly the same distance d from some specific point (x,y).

   Define a fuzzy set "Circle" in which closed curves have membership ranging from 0 to 1. Decide what attributes of the curve you will measure, and how you will relate them to membership in "Circle". You can use knowledge of geometry, but you don't have to give detailed formulas for the measurable attributes you use. An example might be:

   1. Find the centre of area of C – call it p
   2. Find the distance from p to the closest point on C – call this d1
   3. Find the distance from p to the furthest point on C – call this d2
   4. Compute d1/d2 as the membership of C in "Circle"

   but I am sure you can come up with something better than that.