

Fuzzy Logic and Fuzzy Systems Coursework Description

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September 26th, 2013.**

<https://www.cs.tcd.ie/Khurshid.Ahmad/Teaching.html>

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FUZZY LOGIC & FUZZY SYSTEMS

The continuous assessment comprises 20% marks of the Course;

You have to find a fuzzy logic product or service;

Find documentation related to the product or service
product/service description – marketing literature;
learned papers relating to the product service – papers
in learned journals (*IEEE Transactions on Fuzzy
Systems* -

<http://ieeexplore.ieee.org/xpl/RecentIssue.jsp?punumber=91>, *Journal of Fuzzy & Intelligent Systems* -

<http://www.iospress.nl/loadtop/load.php?isbn=10641246> -, and many other publications listed on

<http://www.abo.fi/~rfuller/fuzs.html>

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FUZZY LOGIC & FUZZY SYSTEMS

The continuous assessment comprises 20% marks of the Course;

- Find out the fuzzy sets, linguistic variables and terms, and membership functions used in the construction of the product or service;
- Build a simulation using MATLAB, for example, of your chosen product service;

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Write a 4 page report (c. 1000 words) describing your experience perhaps along the following structure:

1. Introduction;
2. Description of product/service;
3. Outline fuzzification, composition, inference, de-fuzzification used in the product/service.
4. Describe your simulation
5. Conclusion: Was the use of fuzzy logic justified;

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The Report is due by 9th January 2014

***For some submissions there may be a 15 minute Presentations of the Report to take place during week beginning 2nd April 2014.**

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Hints for Coursework:

Risk Assessment for Chemical Plants

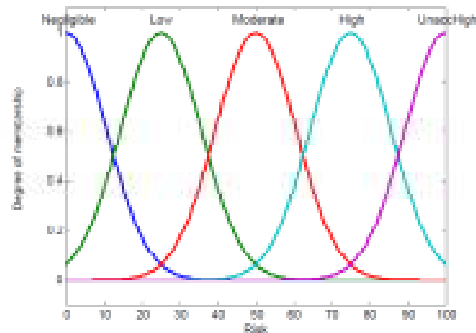
Narendra Mahant (2004). Risk Assessment is Fuzzy Business—Fuzzy Logic Provides the Way to Assess Off-site Risk from Industrial Installations

<http://www.bechtel.com/assets/files/PDF/BIP/34936.pdf>

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Risk assessment is an “assessment” of something hypothetical defined as “risk”, which must then be interpreted as “high”, or “low”, or “tolerable”. Such assessment, whether qualitative or quantified, requires analyst’s judgement, expert human knowledge and experience. Quantification of risk in scalar values is subject to uncertainties for many reasons including difficulties in defining the likelihood and consequence severity and the mathematics of combining them.



<http://www.bechtel.com/assets/files/PDF/BIP/34936.pdf>

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Hints for Coursework:

Insurance and Uncertainty

Jean LeMaire (1990). Fuzzy Insurance.

ASTIN Bulletin – The Journal of the International Actuarial Association

Volume 20, No. 1 – April 1990. pp 33-55.

<http://www.casact.org/library/astin/vol20no1/33.pdf>

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Insurance and Uncertainty

Let X be a set of prospective policyholders,

$$x = x(T1, T2, T3, T4).$$

Assume that the requirements for the status of "preferred policyholder" will be based on the values taken by 4 variables

T1: the total level of cholesterol in the blood, in mg/dl,

T2: the systolic blood pressure, in mm of Hg

T3: the ratio (in %) of the effective weight to the recommended weight, as a function of height and build

T4: the average consumption of cigarettes per day

<http://www.casact.org/library/astin/vol20no1/33.pdf>

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In the USA, The recommend a level of less than 200 mg of cholesterol per deciliter of blood levels between 200 and 240 mg/dl are considered to be borderline high. The fuzzy set A of the people with a low level of cholesterol can then be written as U

$$U_A(x|t_1) = \begin{cases} 1 & t_1 \leq 200 \\ 1 - 2 \left(\frac{t_1 - 200}{40} \right)^2 & 200 \leq t_1 \leq 220 \\ 2 \left(\frac{240 - t_1}{40} \right)^2 & 220 \leq t_1 \leq 240 \\ 0 & 240 \leq t_1 \end{cases}$$

<http://www.casact.org/library/astin/vol20no1/33.pdf>

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Hints for Coursework:

Fuzzy Syrup Mixing:

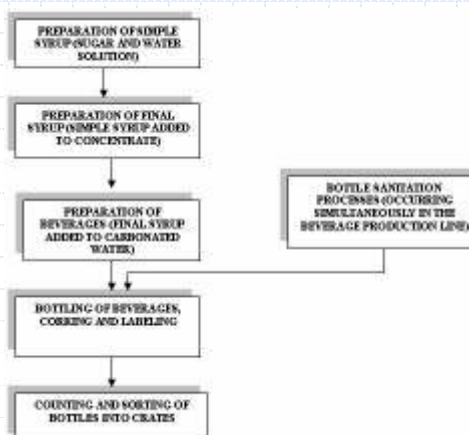
Philip Babatunde OSOFISAN . Fuzzy Logic Control of the Syrup Mixing Process in Beverage Production

http://ijis.academicdirect.org/A11/093_108.htm

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Syrup Mixing Process in Beverage Production

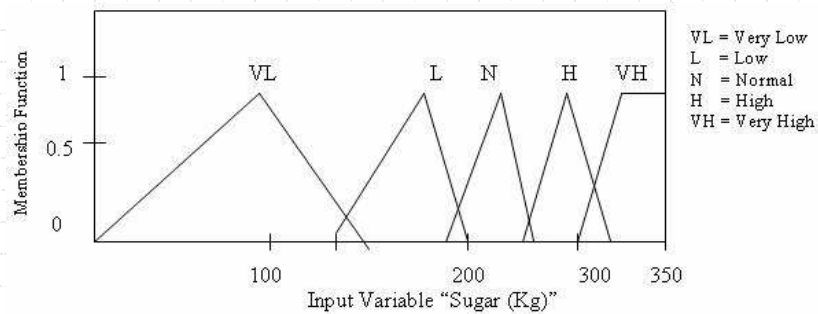


http://ijis.academicdirect.org/A11/093_108.htm

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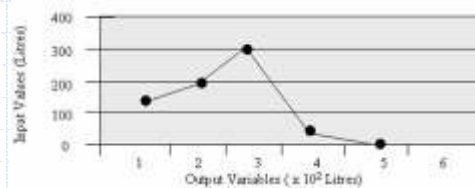
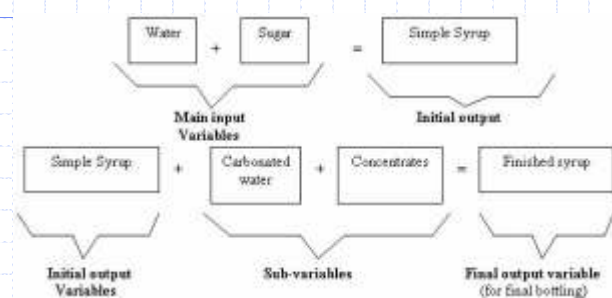
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How sweet is sweet?



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