ARTIFICIAL INTELLIGENCE CLASSIFIER TO IDENTIFY BANK FRAUDS IN DEMONETIZATION

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Introduction:

The newly introduced demonetization policy which aimed at curbing black money has led to new frauds. To indentify frauds and the need for further investigation, we here are implementing artificial intelligence using fuzzy logic. We are using Mamdani model with height method for defuzzification. Our antecedents are the amount issued by the RBI in the form of new currency, the maximum approximate number of customers who could be serviced in the limited time window, the discrepancy in the amount claimed to have been exchanged by the bank with realistic values, etc. Our output would be whether the particular bank branch should be investigated or not in this regard.

Literature survey:

Today, we are living in the world of automation. We are proposing an automated approach based on Fuzzy Logic to detect Bank Frauds. Fuzzy logic is an approach to computing based on "degrees of truth" rather than the usual "true or false" (1 or 0) Boolean logic on which the modern computer is based. The idea of Fuzzy Logic was first advanced by Dr. LotfiZadeh of the University of California at Berkeley in the 1960s. Fuzzy logic has been applied to many fields, from control theory to artificial intelligence. Here we apply fuzzy logic classifier based on the Mamdani model to detect bank frauds during demonetization [1].

Classical logic only permits conclusions which are either completely true or completely false. However, there are also situations with uncertain / nondeterministic answers, such as one might find when asking a group of people to identify a color. In such instances, the truth appears as the result of reasoning from inexact or partial knowledge in which the sampled answers are mapped on a spectrum. [2]

Both degrees of truth and probabilities range between 0 and 1 and hence may seem similar at first, but fuzzy logic uses degrees of truth as a mathematical model of vagueness, while probability is a mathematical model of ignorance.[3]

Fuzzy logic systems may be implemented by writing codes on MATLAB by the use of Fuzzy Logic tool box. Fuzzy Logic Toolbox provides functions, apps, and a Simulink block for analyzing, designing, and simulating systems based on fuzzy logic. The product guides you through the steps of designing fuzzy inference systems. Functions are provided for many common methods, including fuzzy clustering and adaptive Neuro-Fuzzy learning. The toolbox lets the user model complex system behaviors using simple logic rules, and then implements these rules in a fuzzy inference system. [4]

The problem we have taken up is unique and new, and there is no existing work on this domain. The reason for this is, after the advent of Fuzzy Logic, India is one of the first nations to go for De-monetization, and the related large scale problems arising out of it [7].
Other than classification of communications like emails and SMS messages, FL is also applied in various other domains. Some Fuzzy Engine approaches are discussed in [9] similarly; an application of FL to medical domain is discussed in [10]

Objectives:
1. Learn Fuzzy Logic And Fuzzy Logic Toolbox Of Matlab.
2. Collect Data /Generate Data.
3. Fuzzify All Input Values Into Fuzzy Membership Functions.
4. Execute All Applicable Rules In The Rule-Base To Compute The Fuzzy Output Functions.
5. De-Fuzzify The Fuzzy Output Functions To Get "Crisp" Output Values.
6. Design A System That Is Smart Enough To Let The User Know Whether The Particular Bank Branch Should Be Investigated Or Not.
7. To Develop Economically Feasible Methods.

Work plan and methodology:
- Here we consider a particular bank branch as a system and the antecedents to the system are (a) Amount exchanged (b) Amount Withdrawn (c) Number of customers Serviced (d) Number of Non Customers Serviced (e) Mismatch of Exchanged amount as reported by bank and feedback from customers (f) the number of customer who could be possibly serviced in the limited time window.
- We collect data from bank (from their report to RBI) to know how many people they have claimed to have serviced between Nov 8th to Dec 31st, and how much currency was exchanged.
- We then collect information from people (via google forms) to check whether it matches the data provided by the bank.
- If there is a mismatch between the peoples' data and the bank, depending on the severity of the mismatch the Fuzzy Classifier will classify the severity of the problem and a message would notify the government investigative agency whether the bank should be investigated or not, and the urgency of the suspicious transactions.
- This would be done by writing a code in Matlab software tool.
- We create a Fuzzy Inference Engine by writing the code.
- We then put the collected data into the engine whose output would be whether the bank should be investigated or not.

The block diagram below shows the system of the proposed work
Scope of the project:
Since there are a lot of known and unknown frauds happening in the banks currently, the RBI, Government of India and even the CBI can use this device to probe them all. The banks themselves can use it to check for frauds happening behind the curtains. It is also patentable and later we will try to patent it and sell.

Expected outcomes:
- To display the classified status on screen.
- To notify the investigating agency whether the Bank Should be Investigated or Not.
- To send SMS/Email messages to concerned agencies (as a prototype only) to report the situation.

Conclusion:
Thus on implementing such a technology the frauds done within the banks could be probed and identified for further investigation. All branches cannot be probed in depth but the fuzzy engine will allow us to make a decision about which ones need in depth study.