# Induced Extended Fuzzy Clustering Method (IEFCLM) for Uncertainty

**Srimathi V, Bennilo Fernandes J**

***Abstract:*** ***The Act 1995 seriously started taking policy decisions to rehabilitate the PWDs by allotting funds and implementing programs, though not to the full satisfaction of PWDs. The rural PWDs are yet to be sensitized on their rights as per the Act. Assuring by a NGO in Melmalayanur District found over eighty percent of PWDs not having the basic Natural ID card, require for availing and rehabilitation measures. In this paper the difficulties faced by the rural deprived PWDs were analyzed using Induced Extended Fuzzy Clustering Model (IEFCLM). There are four sections. Section one describes the PWDs, giving the historical background. Section two gives the methodology of hidden pattern of Induced Extended Fuzzy Clustering method. Section three discussesthe study using IEFCLM. Fourth section givesthe result of the study.***

***Keywords: Fuzzification, Induced FCM, Extended FCM, algorithm, Persons with disabiblites***

## I. INTRODUCTION

Attitudes to disability were mixed and ever changing. There were periods when the disabled were thought of persons who suffer for the sin committed in the past. To help them is going against the will of God and Law of karma. Manu, the greatest law giver, in his sanidhi, treated the disabled on par with dog. They were denied right to take decisions, right to ancestral property, right to life, right to marriage etc. According to Roman law, if a child is born disabled, it could be killed after proving the neighbor, the child was disabled. The children born disabled were taken to hill tops and thrown to death.

But belief systems changed over the passage of time due to intervention by divine personalities such as Lord Buddha, Jesus Christ. Due to advancement in science and technology now the people are slowly getting sensitized on the real causes for disability. Disability occurs even before the child is conceived, after conception in the womb, during the delivery of the child and after birth. The world wars have witnessed good number of able bodied soldiers losing their limbs. The Millennium development goals of U.N are specifically designed to address the needs of the world's poorest citizens and the world's most marginalized populations. While persons with disabled make up ten percent of world's population, disability is associated with twenty percent of the global poverty according to the findings of the World Bank. Naturally, the policy makers at the International and National level should include the Rights of the PWDs in implementing MOG.

This thought process had given rise to various countries focusing on the rights and rehabilitation of the PWDs. India has enacted Persons with Disability Act 1995 and has been focusing on their rights by observing Asian Decades of Disability 1992-2002, 2000-2012,20 and so on.

## II. METHOD OF HIDDEN PATTERN

**Step1:** The nodes for the study were collected from the expert's.
**Step2:** By passing the instantaneous state vector in ON state, the vector with maximum number of one's was considered as the resulting vector.
**Step3:** Every node of the resulting vector is then passed to get the resultant vector of it.
**Step4:** The maximum number one's is considered as the resultant vector and this process is carried over until the fixed point occurs.
**Step5:** The nodes resulting in the vector with maximum number of one's were then categorized in three range of clusters and then the algorithm of extended Fuzzy Clustering is then applied to obtain the dominant node among the most induced one.

## III. AN ANALYSIS ON THE PROBLEMS FACED BY DEPRIVED RURAL PWDs

The nodes of the problem are listed below:
$C_1$- Not considered in decision making process either at home or in the society
$C_2$- Unemployed/Unskilled to earn a living on their own
$C_3$- Marriage remains a question mark
$C_4$- Suffer from mental stress & trauma
$C_5$- Denied good food, clothing, sheltering, health care, etc.
$C_6$- Loss of Identity (ID)
$C_7$- Lack of mobility
$C_8$- Considered to be the result of "Cause of GOD"
$C_9$- No share in property
$C_{10}$- Not able to be independent and depend upon other foe their day-today activities
$C_{11}$- Poverty
$C_{12}$- Welfare measures seldom reach them
$C_{13}$- Discriminated marginalized
$C_{14}$- Lack political will and insufficient rehabilitation
$C_{15}$- No knowledge on welfare measures such on SSHC

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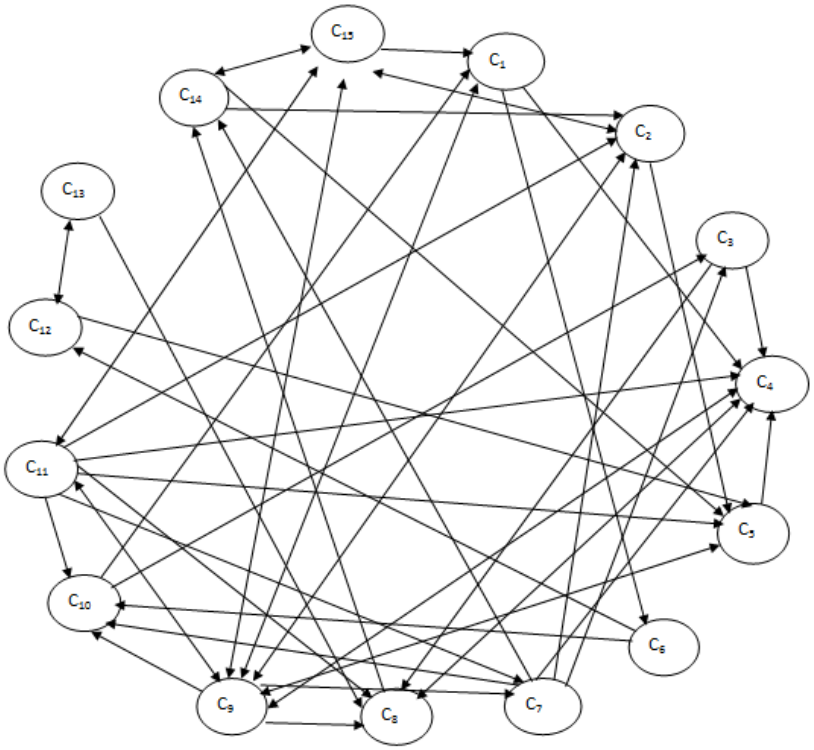


**Fig. 1 The Directed graph**

E =

| | $C_1$ | $C_2$ | $C_3$ | $C_4$ | $C_5$ | $C_6$ | $C_7$ | $C_8$ | $C_9$ | $C_{10}$ | $C_{11}$ | $C_{12}$ | $C_{13}$ | $C_{14}$ | $C_{15}$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| $C_1$ | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| $C_2$ | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| $C_3$ | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| $C_4$ | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| $C_5$ | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| $C_6$ | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 |
| $C_7$ | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 |
| $C_8$ | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| $C_9$ | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 1 |
| $C_{10}$ | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| $C_{11}$ | 0 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 1 |
| $C_{12}$ | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| $C_{13}$ | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| $C_{14}$ | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| $C_{15}$ | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 0 |

**Fig. 2 The Connection matrix**

Process: 1

Suppose the concept $C_{11}$ (i.e) Poverty is in the on state and another nodes are in the off sate.

Let $C_1$= (000000000010000)

$C_1E$ ↳ (010110111110001) = $C_1^1$

$C_1^1E$ = (010110111110001) x E

$C_1^1E$ ∞ (000000000010000) x E

↳ (010110111100001)

= (010000000000000) x E ↳ (000010001000001)

= (000100000000000) x E ↳ (000000011000000)

= (000010000000000) x E ↳ (000100001000000)

= (000000100000000) x E ↳(011100000100010)

= (000000010000000) x E ↳(000100000000000)

= (000000001000000) x E ↳ (110110110110011)

= (000000000100000) x E ↳ (101000000000000)

= (000000000000001) x E ↳ (110001101010010)



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Maximum number of 1's is $C_2$ (i.e) $C_2$= (110110110110011)

$C_2E$ ↳ (111111111111011) = $C_2^1$

$C_2^1E$ = (111111111111011) x E
= (100000000000000) x E ↳(000101001000000)
= (010000000000000) x E ↳(000010001000001)
= (001000000000000) x E ↳(000100010000000)
= (000100000000000) x E ↳(000000011000000)
= (000010000000000) x E ↳(011100000100010)
= (000001000000000) x E ↳(000000000101000)
= (000000100000000) x E ↳(011100000100010)
= (000000010000000) x E ↳(000100000000000)
= (000000001000000) x E ↳(110110110110011)
= (000000000100000) x E ↳ (101000000000000)
= (000000000010000) x E ↳(010110111100001)
= (000000000001000) x E ↳(000010000000100)
= (000000000000010) x E ↳(010010000000001)
= (000000000000001) x E ↳ (110001101010010)

Maximum number of 1's is $C_3$ (i.e) (110110110110011)

Thus $C_2$= $C_3$

Hence the fixed point is (110110110110011). Carrying the similar process to all other nodes in on state, we obtain the same fixed point (110110110110011) as the dominant result.

**Table. 1 Range of Clusters**

| | Cluster 1 | Cluster 2 | Cluster 3 |
|---|---|---|---|
| **Range** | **2.0-5.0** | **3.0-8.0** | **7.0-10** |
| **Mid Value** | **3.5** | **5.5** | **8.5** |
| **Classification** | **LOW** | **MEDIUM** | **HIGH** |

**Table. 2 Degree of Membership of the attributes – PWDs**

| Attributes | Mean | Low | Moderate | High | ↳ | Low | Moderate | High |
|---|---|---|---|---|---|---|---|---|
| $C_1$ | 4.2 | 0.4 | 0.6 | 0 | ↳ | 0 | 1 | 0 |
| $C_2$ | 7.6 | 0 | 0.4 | 0.6 | ↳ | 0 | 0 | 1 |
| $C_4$ | 2.8 | 1 | 0 | 0 | ↳ | 1 | 0 | 0 |
| $C_5$ | 4.6 | 0.8 | 0.2 | 0 | ↳ | 1 | 0 | 0 |
| $C_7$ | 6.7 | 0 | 1 | 0 | ↳ | 0 | 1 | 0 |
| $C_8$ | 4.4 | 0.3 | 0.7 | 0 | ↳ | 0 | 1 | 0 |
| $C_{10}$ | 7.5 | 0 | 0.5 | 0.5 | ↳ | 0 | 0 | 1 |
| $C_{11}$ | 7.7 | 0 | 0.3 | 0.7 | ↳ | 0 | 0 | 1 |
| $C_{14}$ | 4.2 | 0.4 | 0.6 | 0 | ↳ | 0 | 1 | 0 |
| $C_{15}$ | 2.5 | 1 | 0 | 0 | ↳ | 1 | 0 | 0 |

## IV. CONCLUSION AND SUGGESTIONS

Thus, the Induced Extended Fuzzy Clustering analysis highlighted that among six attributes taken for analysis by the opinion from PWDs we arrived the attributes 2, 10 and 11 (i.e)

$C_2$-Unemployed/Unskilled to earn a living on their own

$C_{10}$- Not able to be independent and depend upon other foe their day-today activities

$C_{11}$- Poverty are the dominant problems of Rural Deprived persons with disabilities. These attributes resulted in on state after thresholding and updating in the high level of classification.

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