ASSESSMENT REPORT ON

Title: Medical Treatment Negligence Analysis

Submitted

as part of **CSE3999-Technical Answers for Real World Problems**

by

16BCE0081
Abinash Satapathy

16BCI0158
Achintya S Rao

16BCE0447
Arunim Roy

To

Dr Vasantha W B

School of Computer Science and Engineering

VIT®
Vellore Institute of Technology
(Deemed to be University under section 3 of UGC Act, 1956)

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Chapter 1
IMPORTANCE OF IDEA & PROBLEM STATEMENT

IMPORTANCE OF IDEA:

Negligence is that violation of the responsibility to worry. A breach of such kind provides a patient with rights to initiate action against negligence.
Persons who provide medical recommendation and treatment implicitly state that they possess the ability and information to treat, that they need the ability to make your mind up whether or not to require a case, to make your mind up the treatment, and to administer that treatment. This is often referred to as associate "implied undertaking" on the part of a medical skilled. The Supreme Court has declared that each doctor "has a requirement to act with an inexpensive degree of care and skill".
Doctors don't seem to be answerable for their services on an individual basis or vicariously if they are not charging fees. So free treatment at a non-government hospital, governmental hospital, health centre, clinic or home wouldn't be thought of a "service" as outlined in Section two of the buyer Protection Act, 1986.
However, no soul is ideal and even the foremost noted specialist may build a slip-up in detective work or identification truth nature of a malady. A doctor may be control answerable for negligence providing one will prove that she/ he's guilty of a failure that no doctor with normal skills would be guilty of if acting with tutelage.
Doctors should exercise a normal degree of ability. However, they can't provide a pledge of the perfection of their ability or a guarantee of cure. If the doctor has adopted the proper course of treatment, if she/ he's accomplished and has worked with a technique and manner best suited to the patient, she/ he can't be deuced for negligence if the patient isn't completely cured.
Sometimes, even the hospital facilities are not good, which in turn, makes the doctor perform poorly on his treatment work. This is a form of negligence of the hospital authorities as a whole.

PROBLEM STATEMENT

To analyse the causes of medical negligence, which ultimately results in loss of life of people at times, by studying multiple real-life cases and obtaining inference from the same using mathematical model.

Keywords: Social, Medical, Mathematics

CHAPTER 2

OBJECTIVES

1 Develop a cognitive model for analysis of the issues where negligence of doctors and hospitals has caused great distress to the affected families and people

2 Extract insights from the collected news reports of various cases related to negligence of doctors/hospital authorities

3 Minimise the numerous deaths/mishaps of innocent people

CHAPTER 3
LITERATURE REVIEW

PAPER TITLE	AUTHOR	IDEA	RESULTS
Clinical errors and medical negligence	Femi Oyebode	The paper[1] discusses the relationship between clinical errors and medical negligence as well as characteristics of lawsuits and events that are sources of lawsuits. The pattern of malpractice claims have been examined. Among the hospitalized worldwide, 3-16% sufer injury as a result of medical intervention, usually due to adverse drug effects. This frequency appears higher in intensive care units and emergency departments.	The paper concludes that 1 in 7 adverse events in medicine result in malpractice claim and the factors that predict that a patient will resort to lawsuit depends on the poor relationship between clinician and the patient and the feeling that the patient was not kept informed. Methods for preventing clinical errors are still in their infancy. The most promising include new technologies such as electronic prescribing systems, diagnostic and clinical decision-making aids and error-resistant systems.
Closed medical negligence claims can drive patient safety and reduce litigation.	Pegalis, S. E., & Bal, B. S.	Malpractice claims were studied and leading causes of surgical error and their ways to prevention was also researched. 444 closed malpractice claims were studied from 4 liability insurers, in which patients alleged a surgical error. [2] Surgeon-reviewers	Reviewers identified surgical errors that resulted in patient injury in 258 of the 444 (58%) claims. Sixty-five percent of these cases involved significant or major injury; 23% involved death. In most cases (75%), errors occurred in intraoperative care; 25% in preoperative

		examined the litigation file and medical record to determine whether an injury attributable to surgical error had occurred and, if so, what factors contributed.	care; 35% in postoperative care. Thirty-one percent of the cases had errors occurring during multiple phases of care; in 62%, more than 1 clinician played a contributory role. Systems factors contributed to error in 82% of cases. The leading system factors were inexperience/lack of technical competence (41%) and communication breakdown (24%). All this data is pertaining to medical care at the US.
Craniofacial surgery and adverse outcomes: an inquiry into medical negligence.	Svider, P. F., Eloy, J. A., Folbe, A. J., Carron, M. A., Zuliani, G. F., & Shkoukani, M. A.	The study[3] aimed to evaluate factors contributing to medical negligence relevant to craniofacial surgery. The methods employed were Retrospective analysis of verdict and settlement reports on the Westlaw legal database for outcome, awards, physician defendants, and other specific factors raised in malpractice litigation.	Of 42 verdicts and settlement reports included, 52.4% were resolved with either an out-of-court settlement or plaintiff verdict, with aggregate payments totaling $50.1M (in 2013 dollars). Median settlements and jury-awarded damages were $988 000 and $555 000, respectively. Payments in pediatric cases ($1.2M) were significantly higher. Plastic surgeons, oral surgeons, and otolaryngologists were the most commonly named defendants. The most common alleged

			factors included intraoperative negligence (69.0%), permanent deficits (54.8%), requiring additional surgery (52.4%), missed/delayed diagnosis of a complication (42.9%), disfigurement/scarring (28.6%), postoperative negligence (28.6%), and inadequate informed consent (20.6% of surgical cases). Failure to diagnose a fracture (19.0%) and cleft-reparative procedures (14.3%) were the most frequently litigated entities.
Knowledge and Awareness among interns and residents about medical law and negligence in a medical college in Vadodara–A Questionnaire Study.	Rai, J. J., Acharya, R. V., & Dave, D.	In India, a study in Bilaspur was conducted [4], comprising of 123 doctors, 68 males and 55 females from varying departments to gauge the frequency of doctors having knowledge of medical law and consequences of negligence. A questionnaire was developed to assess the awareness of consumer protection art and whether they were following medico legal aspects.	It showed that 79.2% of the doctors were aware about the code of medical ethics. Male doctors showed more knowledge compared to female doctors. Department wise general surgeons were slightly more aware than gynaecologists. Along lines of experience also the knowledge differed.

Medical liability of the physician in training.	Wegman, B., Stannard, J. P., & Bal, B. S.	Medical liability of a physician in training has been studied [5], whether the proper standard governing resident physician conduct should be that of a reasonably competent generalist physician, that of a specialty physician, or whether the standard should be some subjective determination that addresses the resident level of training. Westlaw™ and LexisNexis®, two major legal databases used by law professionals, were searched to identify. existing case law and law review articles related to the standard of care that applies to physicians in training. Of 57 sources initially identified, 15 legal cases and 10 law review papers addressed the standard of care pertaining to physicians in training.	Results have shown that the standard by which the professional conduct of a physician in training is measured has varied; most recent legal cases have applied a specialty physician standard. Relevant court rulings have tried to strike a balance between patient interests versus the societal need to train physicians. But conclusively it is the responsibility of the doctor who supervises the professional conduct of the resident.

CHAPTER 4

REQUIREMENTS

Software requirements:

1. Jet Brains PyCharm Community Edition
2. YEd Editor

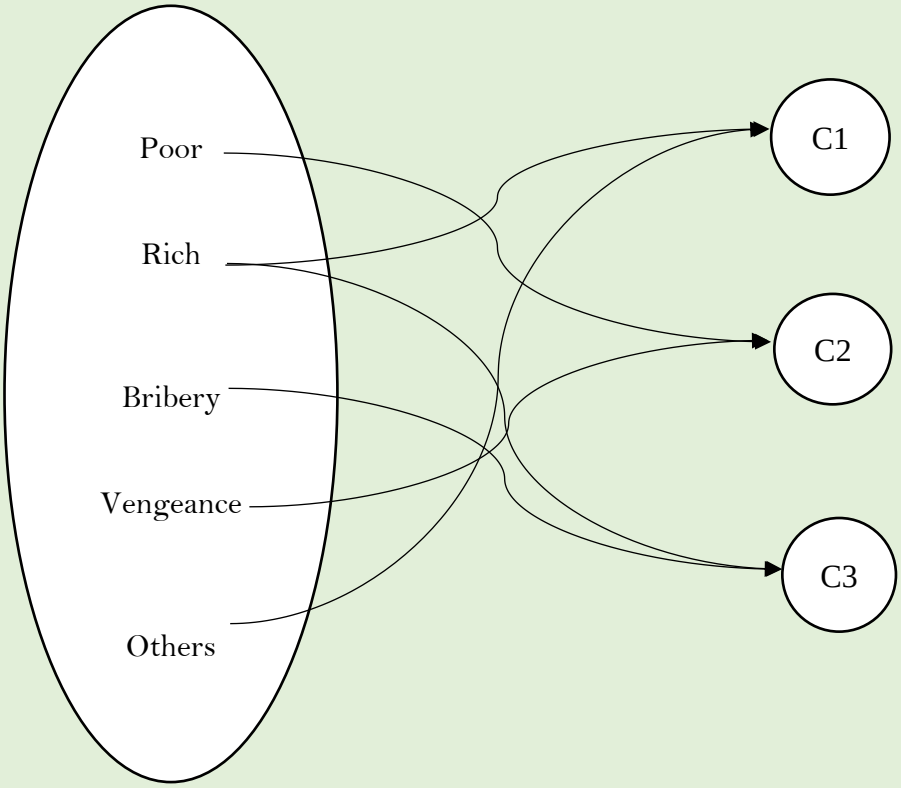
The development costs are **nill** because:

- No hardware component is used
- The software used are freely available without any need for payment

CHAPTER 5
Architecture

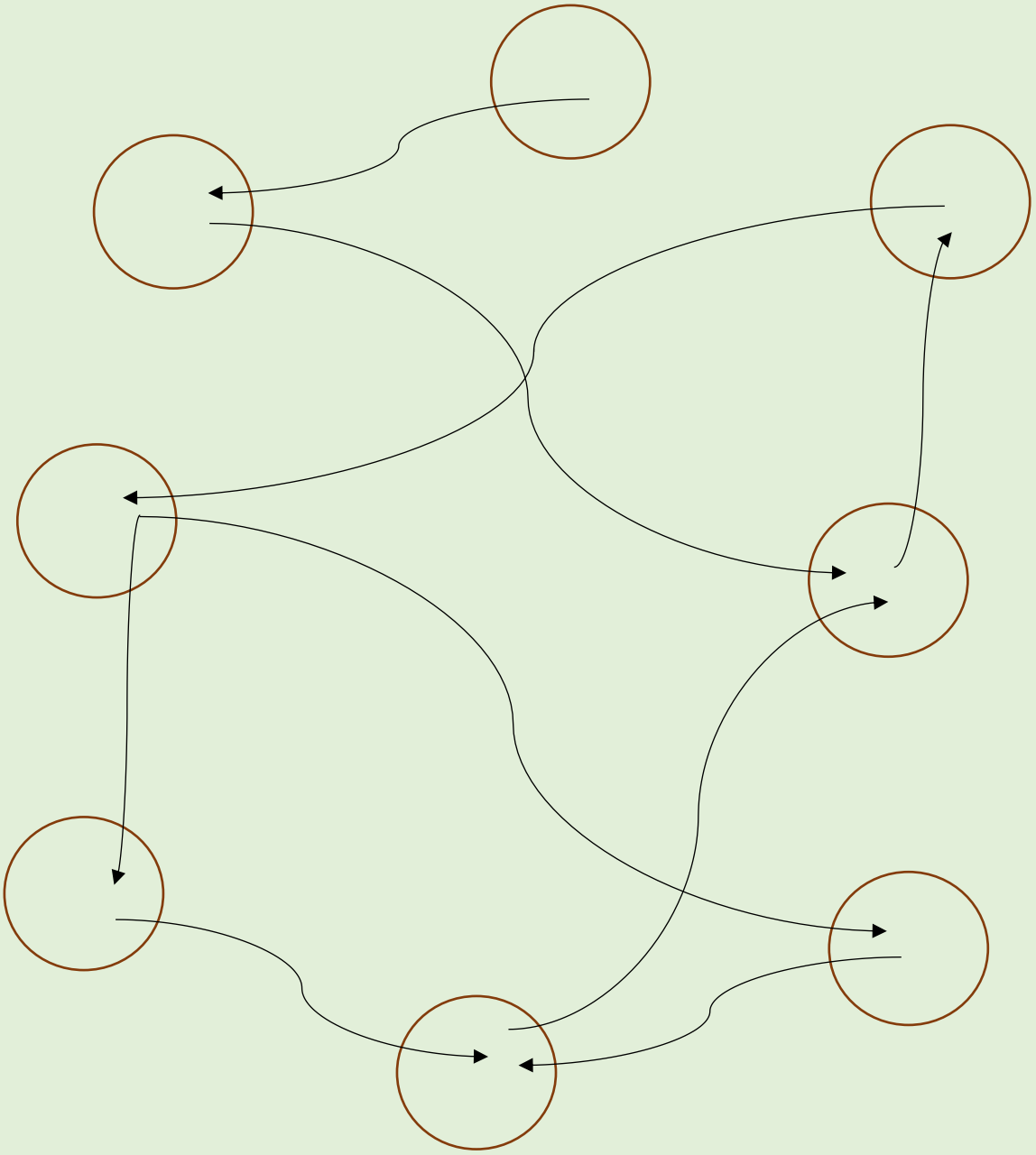
Fuzzy Cognitive Maps are used for modelling of the samples.

We'll have to classify the data into various categories. And then use them for FCM.

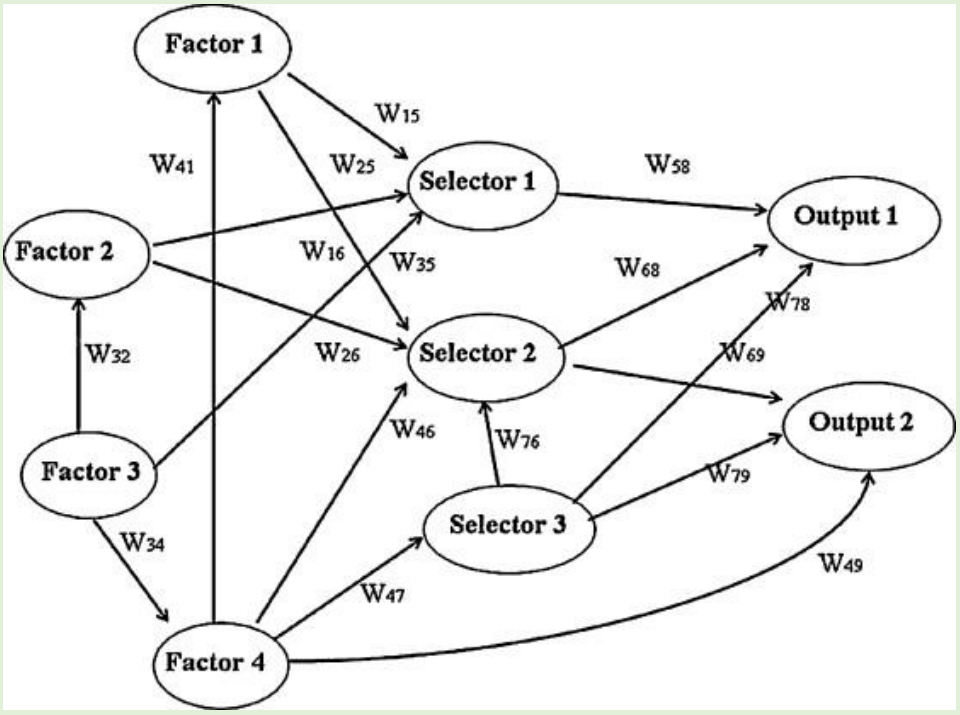


Overall layout of the Fuzzy Cognitive Map [6] with the circles representing various ***key terms*** obtained from the unstructured sample data, i.e. from the newspaper cuttings and online news.

Here, the ***weights*** will be decided later based on the interdependency of the terms with each other.



CHAPTER 6
DEVELOPMENT DETAILS



Keeping the example model in mind, we had to build the concept matrix along with activation vector.

The idea is to threshold the function until we get a limiting vector.

CHAPTER 7
IMPLEMENTATION

Code:

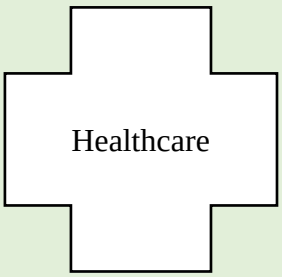
```
print('-----Welcome!-----')
print('This for finding if a concept map is a fixed point or limit cycle')
print('First we inititate the activation vector')
# Program to multiply two matrices using nested loops

X = [[1,0,0,1,1,0,1,0,1,1]] #This is the activation vector

Y = [[0,1,0,1,0,0,0,0,0,0],
    [0,0,0,0,1,1,-1,0,0,-1],
    [0,0,0,0,0,0,0,0,0,0],
    [0,-1,0,0,0,0,0,0,0,0],
    [0,0,0,0,1,0,0,0,0,0],
    [0,0,0,-1,0,0,0,0,1,0],
    [1,0,0,0,0,0,0,1,0,0],
    [0,-1,0,0,1,0,0,0,0,0],
    [0,0,0,1,0,0,0,0,0,0]]
    # This is the concept matrix

result = []
def solve(X, depth):
    #print('X', X)
    if depth == 100:
        print('It is a limit cycle.')
    else:
        result = [[0,0,0,0,0,0,0,0,0,0]]
        for i in range(len(X)):
            for j in range(len(Y[0])):
                for k in range(len(Y)):
                    result[i][j] += X[i][k] * Y[k][j]
        #cpy = result[:]
        for i in range(len(result)):
            for j in range(len(result[i])):
                if result[i][j] < 0:
                    result[i][j] = 0
                if result[i][j] > 0:
                    result[i][j] = 1
        #print('Thresholded: ',result)

        for i in range(len(result)):
            for j in range(len(result[0])):
                if result[i][j] == X[i][j]:
                    continue
                else:
                    result[i][j] = 1
        if result == X:
            print('It is a fixed point.')
            return result
```

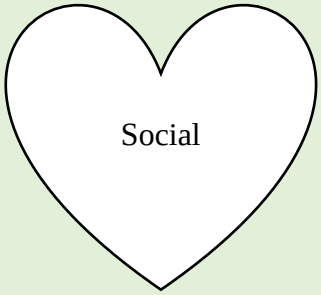
```
        else:
            return solve(result, depth+1)

result = solve(X, 1)

for r in result:
  print(r)
```

```
Achintyas-MacBook-Pro:desktop raoachintya$ python fcm_my_implemet.py
-----Welcome!-----
This for finding if a concept map is a fixed point or limit cycle
First we inititate the activation vector
It is a fixed point.
[1, 0, 0, 1, 1, 0, 1, 1, 1, 1]
Achintyas-MacBook-Pro:desktop raoachintya$
```

CHAPTER 8
Applicability category

Our project is related to two categories, from the mentioned categories of topic.





The issue originates from the healthcare sector and affects the society. Hence, it's an amalgam of two categories.

Reasons to be of Healthcare domain:

- Involves doctors and patients
- Involves hospital facilities
- Involves surgery reports and medical practices
- Sometimes involves euthanasia without consent

Reasons to be of Social domain:

- Involves the public
- Involves the issue of deaths of innocent people
- Causes uproar among the general public
- Affects individual or a certain community as whole

Chapter 9
CONCLUSIONS

- We inferred that medical negligence is not only caused due to the negligence of the doctors; rather it involves several other parameters like education status, bribery, hate, etc.

- Hospital authorities should improve the environment conditions of the patients. It is one of the major causes of mishaps pertaining to patients.

- Strong correlation exists between economy status and the mishaps happening due to negligence.

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BRIEF BIOGRAPHY OF EACH TEAM MEMBERS

Abinash Satapathy

Abinash Satapathy is pursuing his Bachelor Degree (B. Tech.) in Computer Science and Engineering at Vellore Institute of Technology, Vellore, India. Currently, he is in 3rd year. He is an active person in the field of Quantum Computing, Theoretical Physics and Mathematics. His interests lie in Quantum circuits and Quantum Cellular Automata. Currently, he is working on Quantum Optimisation algorithms besides focusing on Singularity.

Achintya S Rao

He is a technological enthusiast and has interest in Information security, machine learning and artificial intelligence who aims to grow in the same. He is currently pursuing his B Tech in Computer Science and Engineering with specialisation in Information Security.

Arunim Roy

He is from VIT university, currently pursuing his third year in B Tech Computer Science and Engineering. His interest lies in Machine learning and Mathematics. He is inquisitive about how the world operates and the numerous ways in which Computer science is benefitting mankind. My hobbies include reading and listening to music.