

# Pancreatic Cancer Detection and Diagnosis Expert System using Artificial Neural Networks and Fuzzy Logic Techniques

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**Abstract** - Cancer is a class of diseases characterized by out-of control cell growth and pancreatic cancer (PC) occurs when this uncontrolled cell growth begins in the pancreas. If it is malignant and not detected at early stages, it may cause death. The aim of this research work is to present artificial neural network and fuzzy logic in pancreatic disease diagnosis based on a set of symptoms. The real procedure of medical diagnosis which usually is employed by physicians was analysed and converted to a machine implementable format. This paper presents an approach to detect the various stages of pancreatic cancer affected patients. Outcome suggests the effectiveness of using neural network over manual detection procedure.

**Keywords** - *Neural Networks , Pancreatic Cancer , Fuzzy Logic.*

## 1. Introduction

Lung infection is the sporadic improvement of cells in one or both lungs, and usually happens in cells that are impeding air exchange. Atypical cells won't make strong conventional tissues; they will segment rapidly and structure tumors. Area of lung development in early stages is out and out vital in treatment. In America, 1 of every 14 men, and 1 of every 16 women are having lung threat. The measure of risk for smoking people is significantly more. Most of the patients of the lung sickness is dissected at 60 years of age. There are 2 unmistakable sorts of lung development, of this too, little cell lung danger is more intense, it suggests that in the early stages it can spread snappier to exchange organs of the body.

There are 4 classes for sorting out the lung tumor, regardless; altogether, masterminding is segregated into 3 general periods of the ailment:

Stage 1: the reach is pretty much nothing and constrained to the lung and 85 to 90 percent of the time it's treatment with surgery is adequate.

Stage 2: territory is nearly nothing, and it fuses the lungs and lymph center points and treatment is chemotherapy or chemotherapy merged with radiation treatment and surgery.

Stage 3: territory is greater and despite lungs and lymph center points, it has spread to various organs and treatment is chemotherapy and sometimes chemotherapy solidified with radiation treatment

Pancreatic cancer is the fourth most common cause of cancer related deaths in the United States and the eighth worldwide. Pancreatic cancer is of malignant type neoplasm originates from transformed cells arising in tissues form the pancreas. Pancreas is a 6-inch long spongy organ located behind the stomach in the back of the abdomen. The pancreas contains exocrine and endocrine glands that create pancreatic juices, hormones, and insulin. Pancreatic juices, or enzymes, made by the exocrine glands are released into the intestines by way of a series of ducts in order to help digest fat, proteins, and carbohydrates. The endocrine cells are arranged in small clusters called islets of Langerhans, which release insulin

and glucagon into the bloodstream. These two hormones manage levels of sugar in the blood. When they are not working properly, the result is often diabetes. The abnormal pancreas tissues continue dividing and form lumps or masses of tissue called tumors. Tumors then interfere with the main functions of the pancreas.

## 2. About the Research Work

### 2.1 Existing System

There is no proper automated tool use for the purpose of Pancreatic Cancer Detection diagnostic system. Patients are concern to the doctor then doctor analyze about the patient condition and implements to the process of cure for disease.

### 2.2 Proposed Research Work

In the proposed system presented a neural network based approach for pancreatic cancer diagnosis. Pancreatic cancer detection in its early stage is the key of its cure. The automatic diagnosis of pancreatic cancer is an important, real-world medical problem. In this paper it has shown how neural networks are used in actual clinical diagnosis of pancreatic cancer. Neural network model, a diagnostic system that performs at an accuracy level is constructed here. The designed system uses a set of fuzzy values incorporated into neural network system is more precise than the normal system. Each output neuron is further processed by using transfer function to provide more accuracy as compared to existing systems.

The main aim of the research work discussed in this paper is to show that neural networks can make an accurate individualized prognosis of a patient given his or her particular condition. The need of designing a system that would help to diagnose of pancreatic cancer cannot be over emphasized. This paper demonstrates the practical application of human intelligence in the health sector. In diagnosis of pancreatic cancer using neural network provides a self-learning intelligent system that is capable of tackling uncertainties in the diagnosis process. This paper provides the information of the patients whether they have pancreatic cancer or not. This diagnosis is functioning depending on some symptoms which has been taken from their previous medical records and physician and train these symptoms through neural network to detect which patient is suffering from pancreatic cancer or he/she might be suffering from pancreatic cancer or may not suffer at all. The neural network using fuzzified symptoms values is applied in this approach to diagnosis pancreatic cancer properly.

## 3. Results

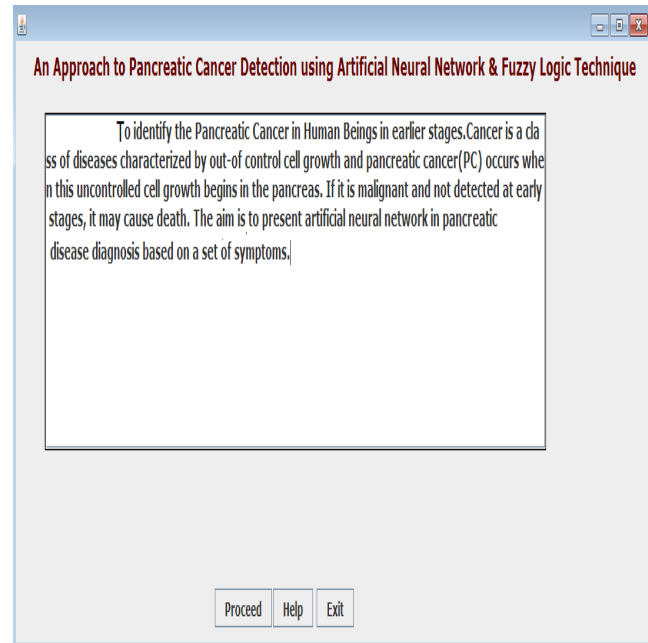


Fig 1. Pancreatic Cancer Detection Screen

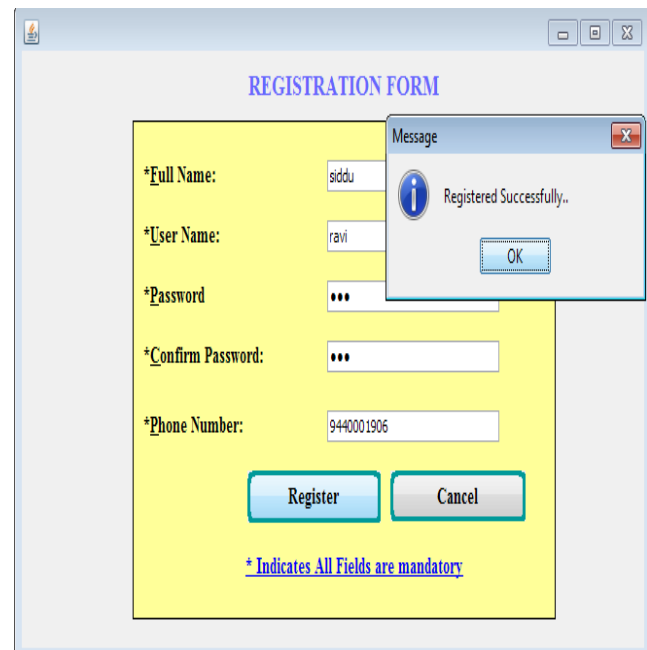


Fig 2. Registration Form

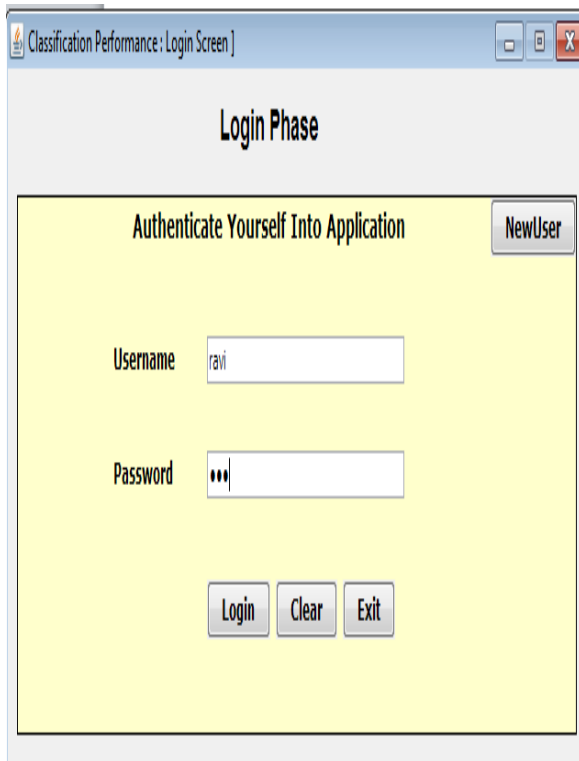


Fig.3 Login Phase

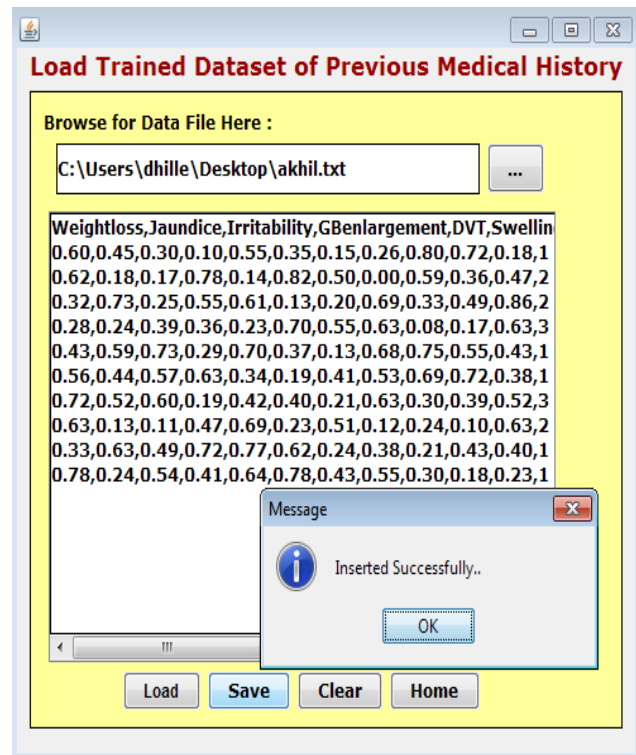


Fig.4 Training Data Set

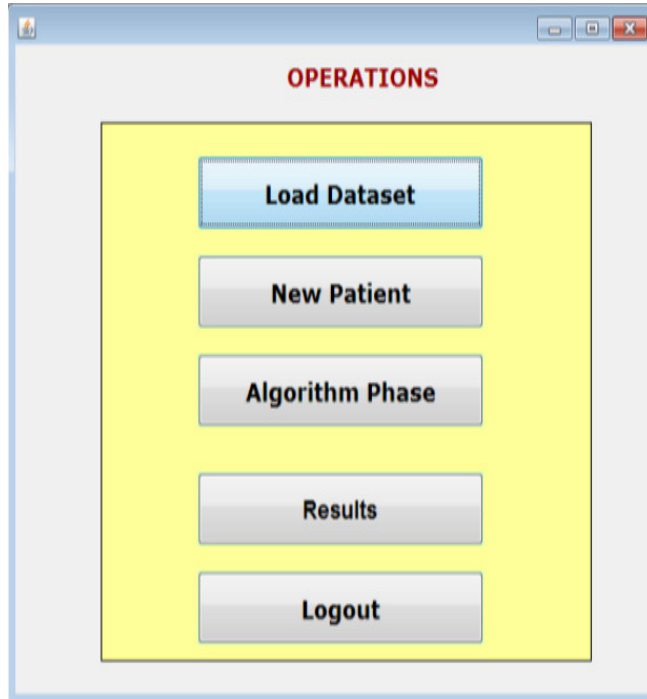


Fig 5. Operations on System

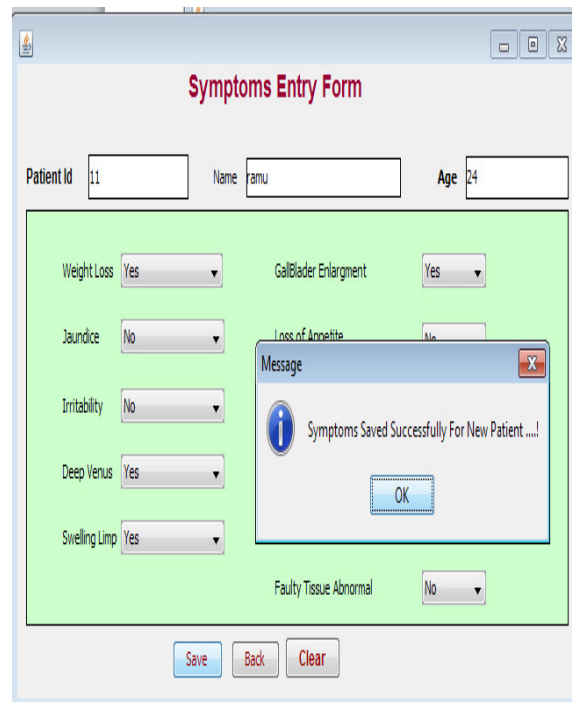


Fig 6. Symptoms Entry Form

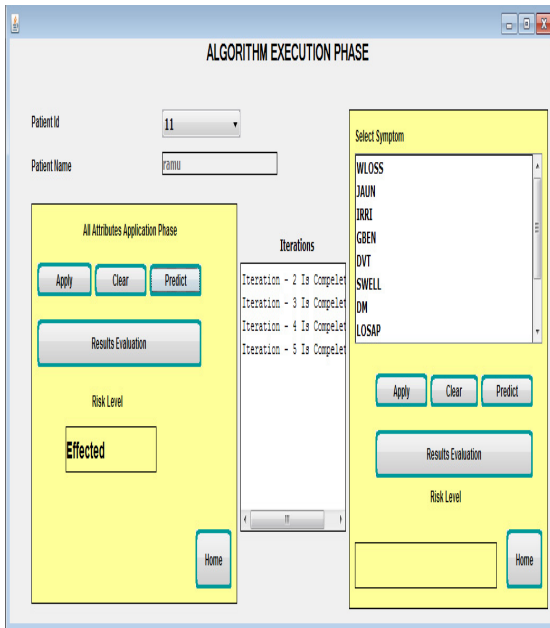


Fig.7 Executing Algorithm

PatientID	Symptoms	Result
p.414	WLOSS,JAUN,IRRI,GBEN,DVT,SWE...	Not Effected
876	WLOSS,JAUN,IRRI,GBEN,DVT,SWE...	Not Effected
3344	WLOSS,JAUN,IRRI,GBEN,DVT,SWE...	Not Effected
1213	WLOSS,JAUN,IRRI,GBEN,DVT,SWE...	Not Effected
456	JAUN,GBEN,SWELL	Not Effected
12345	WLOSS,JAUN,IRRI,GBEN,DVT,SWE...	Effected
121	WLOSS,JAUN,IRRI,GBEN,DVT,SWE...	Might Be Effected
455	WLOSS,JAUN,IRRI,GBEN,DVT,SWE...	Not Effected
566	IRRI,GBEN,DVT,SWELL,DM,LOSAP	Effected
13	WLOSS,JAUN,IRRI,GBEN,DVT,SWE...	Not Effected
11	WLOSS,JAUN,IRRI,GBEN,DVT,SWE...	Effected
555	JAUN,IRRI,DVT,SWELL,LOSAP	Not Effected

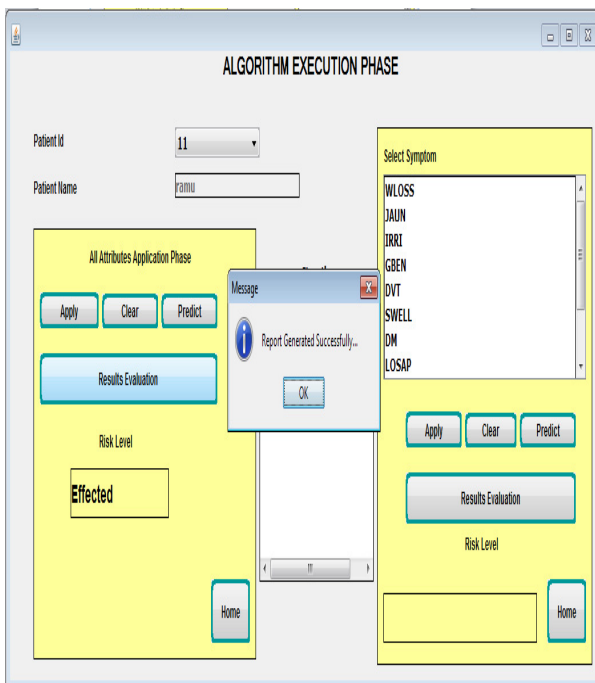


Fig 8. Algorithm Execution and Result

#### 4. Conclusion

This System presents a neural network based approach for pancreatic cancer diagnosis. Pancreatic cancer detection in its early stage is the key of its cure. The automatic diagnosis of pancreatic cancer is an important medical problem. This system uses a set of fuzzy values incorporated into neural network system is more effecter than the normal system.

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