


# Chapter 2

# Machine Learning in Healthcare

**Debasree Mitra**

 <https://orcid.org/0000-0003-3723-9499>  
*JIS College of Engineering, India*

**Apurba Paul**

*JIS College of Engineering, India*

**Sumanta Chatterjee**

*JIS College of Engineering, India*

## **ABSTRACT**

*Machine learning is a popular approach in the field of healthcare. Healthcare is an important industry that provides service to millions of people and as well as at the same time becoming top revenue earners in many countries. Machine learning in healthcare helps to analyze thousands of different data points and suggest outcomes, provide timely risk factors, optimize resource allocation. Machine learning is playing a critical role in patient care, billing processing to set the target to marketing and sales team, and medical records for patient monitoring and readmission, etc. Machine learning is allowing healthcare specialists to develop alternate staffing models, intellectual property management, and using the most effective way to capitalize on developed intellectual property assets. Machine learning approaches provide smart healthcare and reduce administrative and supply costs. Today healthcare industry is committed to deliver quality, value, and satisfactory outcomes.*

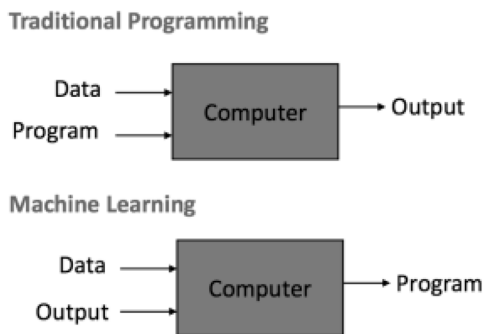
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## INTRODUCTION

### What Is Machine Learning?

Machine learning (ML) explores algorithms that learn from data, builds models data and that model used for prediction, decision making or solving task. A computer program is to learn from experience E with respect to some class of task T and performance P. There are two components in ML i.e. learning module and reasoning module. Learner module takes input as experienced data and background knowledge and builds model. Models are used by reasoning module and reasoning module comes up with solution to the task and performance measure. Machine Learning algorithms can generate a mathematical model based on experience data known as training data to predict or decisions.

Figure 1. Traditional Programming vs Machine Learning



Machine learning algorithms are used in diagnose disease, banking system, healthcare, email filtering, and computer vision, data mining, robot control, Natural Language Processing, Speech Recognition, Machine Translation, Business Intelligence, Fraud Detection, Consumer sentiment etc where it is very helpful to develop an algorithm of specific instructions for performing the task. Machine learning is related to statistics and probability, which focuses on making predictions using computers.

### What Is Healthcare?

**Healthcare** is the upgradation of health via technology for people. Health care is delivered by health professionals in allied health fields. Physicians and physician associates are a part of these health professionals. Dentistry, pharmacy, midwifery,

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