



# MOTILAL NEHRU COLLEGE UNIVERSITY OF DELHI



## DEPARTMENT OF MATHEMATICS

### PATTERN RECOGNITION

A PRESENTATION TOPIC BELONGS TO LATEX

October 27, 2018

## GROUP MEMBERS DETAILS



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▶ HARIOM

▶ MTH17097

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- ▷ HARIOM
- ▷ ANSHUL
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- ▷ MTH17095

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# INTRODUCTION

- \* Pattern Recognition is a branch of Artificial Intelligence.
- \* Humans can recognize the faces without worrying about the varying illuminations. When implementing such recognition artificially, it becomes a very complex task.
- \* The field of Artificial Intelligence has made this complex task possible.



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Figure: DNA sequence

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# Evolution of Pattern Recognition

Looking at the history, pattern recognition system has come a long way. Earlier it was confined to theoretical research in the field of statistics for deriving various models out of the large amount of data. With the advent in computer technology, number of practical applications is increased in manifold which lead to further theoretical development.

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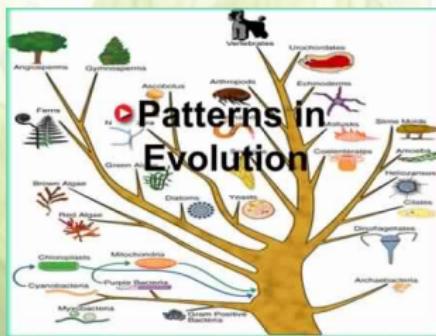
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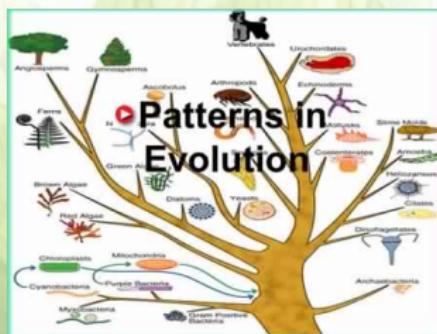
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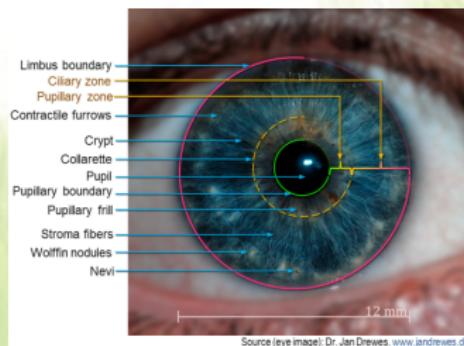


Figure: Eye PRS

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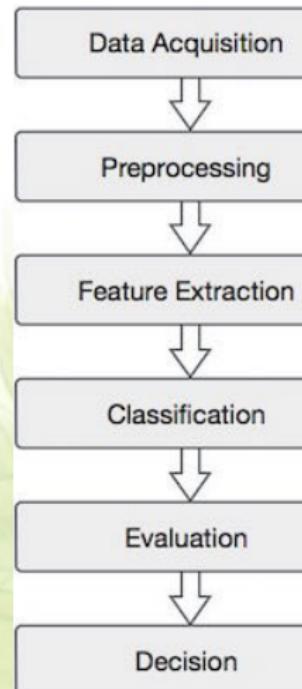
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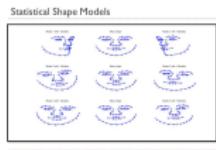


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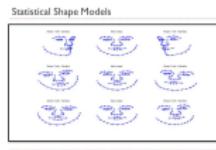
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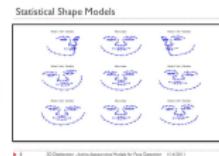
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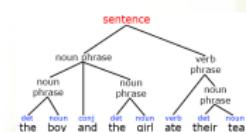
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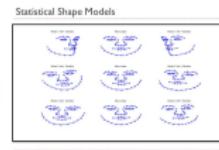
10.1.2 Statistical Shape Models

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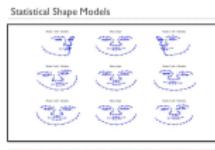
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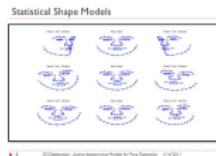


12.1.1.1 Statistical Shape Models for Face Detection

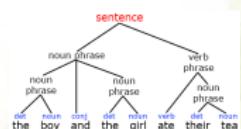


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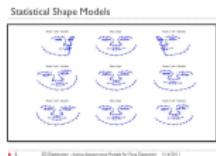
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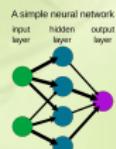
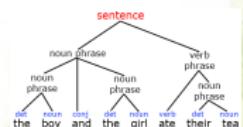
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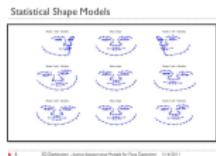


12 Dimples - Active Appearance Models for Face Detection 11/4/2011

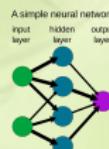
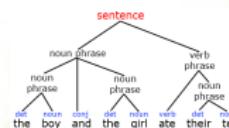


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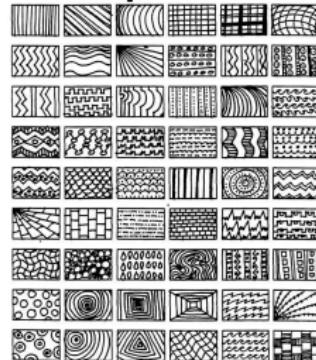
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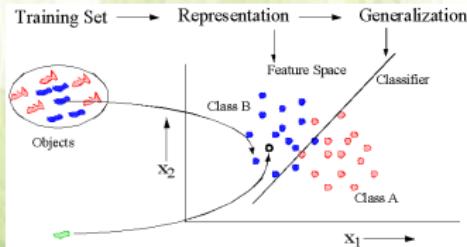
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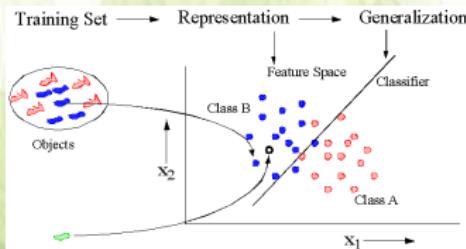


Figure: SR

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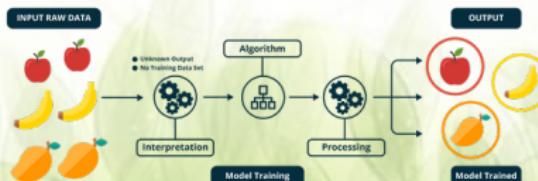


Figure: Supervised Learning

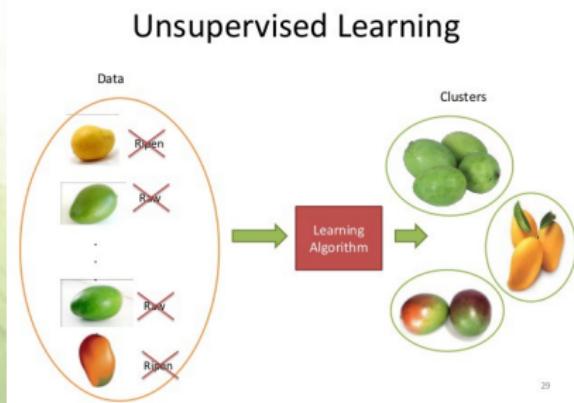
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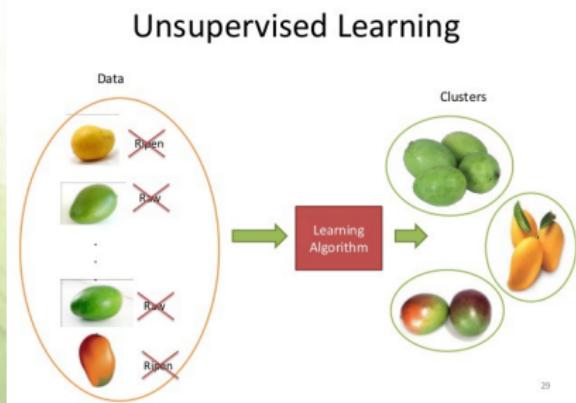
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**Figure:** Fingerprint



**Figure:** Fingerprint Recognition

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Figure: Example(Optical Character Recognition)

# APPLICATION OF PATTERN RECOGNITION

## CHARACTER RECOGNITION

- Character recognition is useful in banking, postal applications, automated mail sorting, automatic license plate recognition, optical character recognition.



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**Figure:** Speech-To-Text

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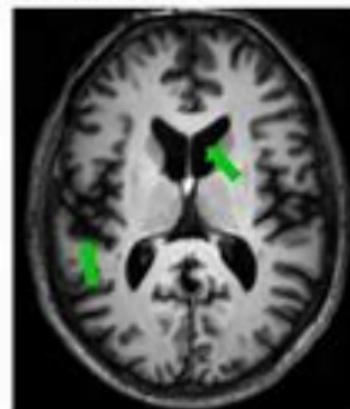
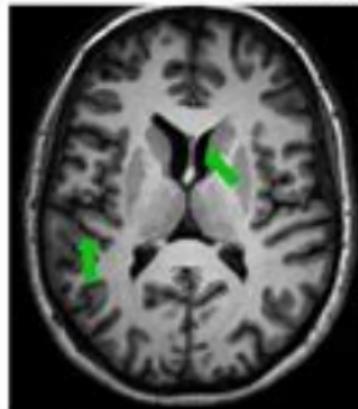
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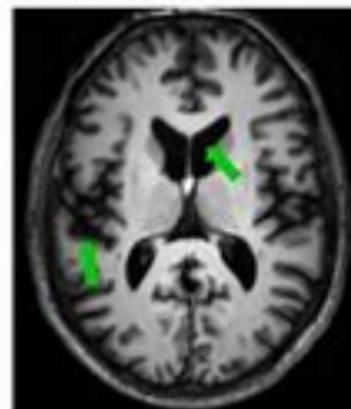
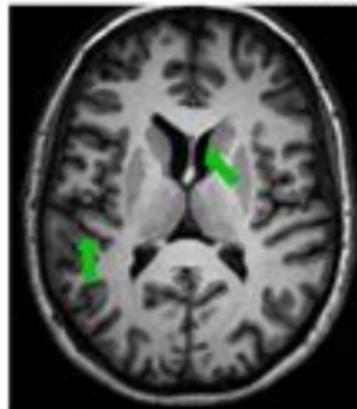
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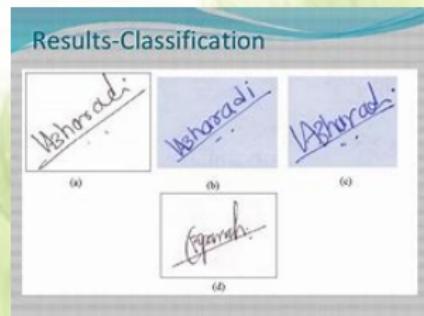


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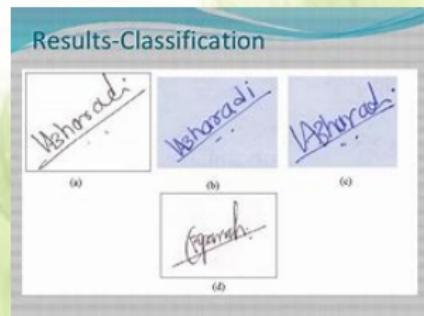


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## ◆ Optical Music Recognition Architecture

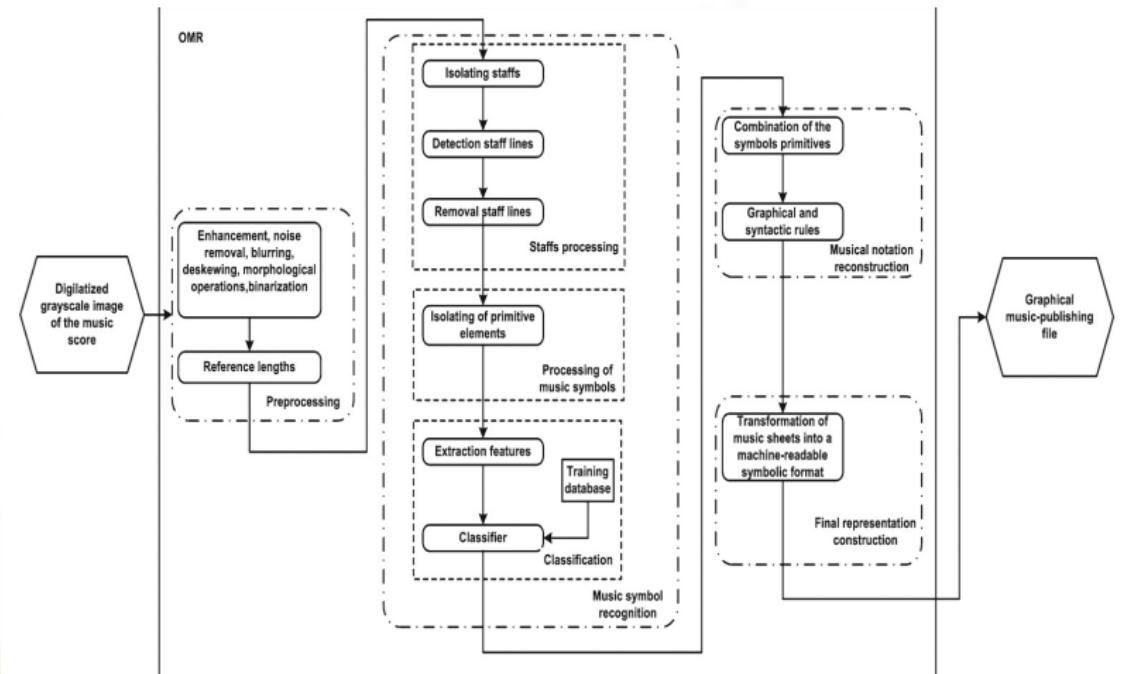


Figure: Typical architecture of an OMR processing system

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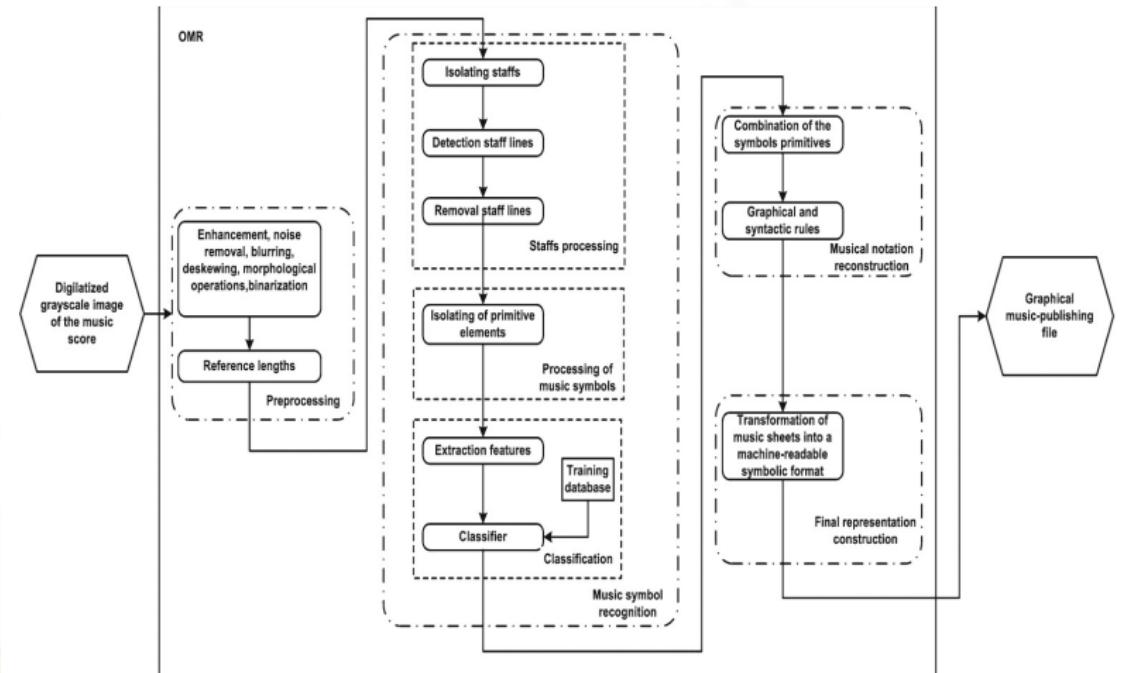


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Music notation is a kind of alphabet, shaped by a general consensus of opinion, used to express ways of interpreting a musical passage. It is the visual manifestation of pitch, dynamics, time, and timbre. Symbols indicating the choice of tones, their duration, and the way they are performed are important.

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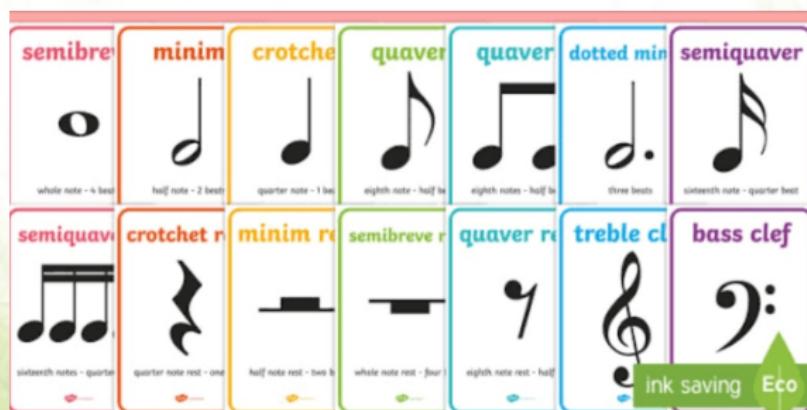


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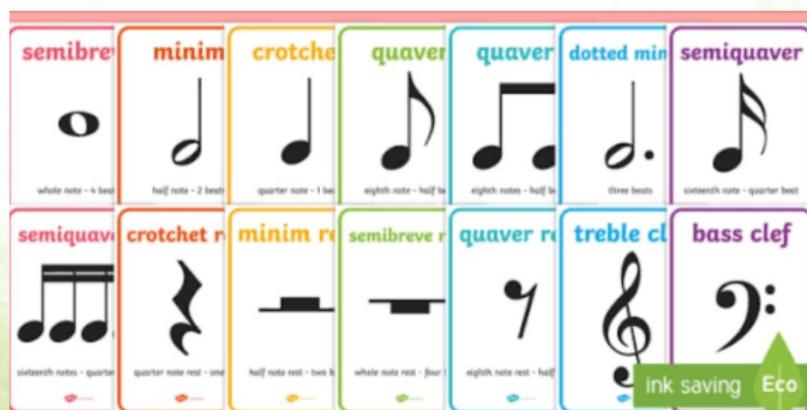


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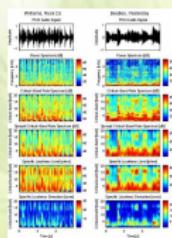


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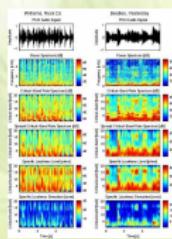


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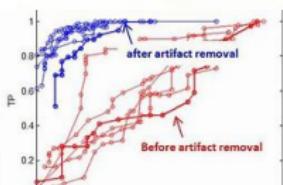


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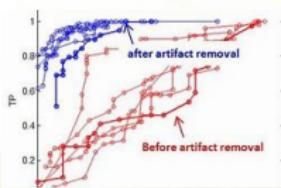


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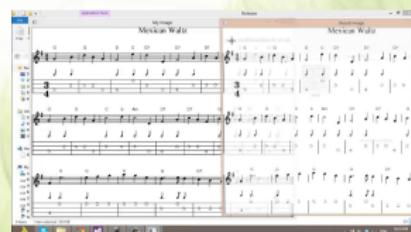


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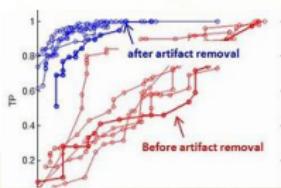


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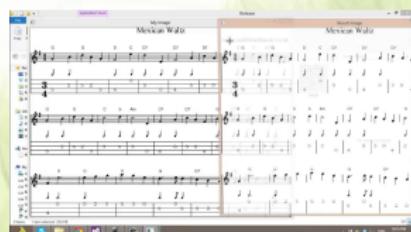


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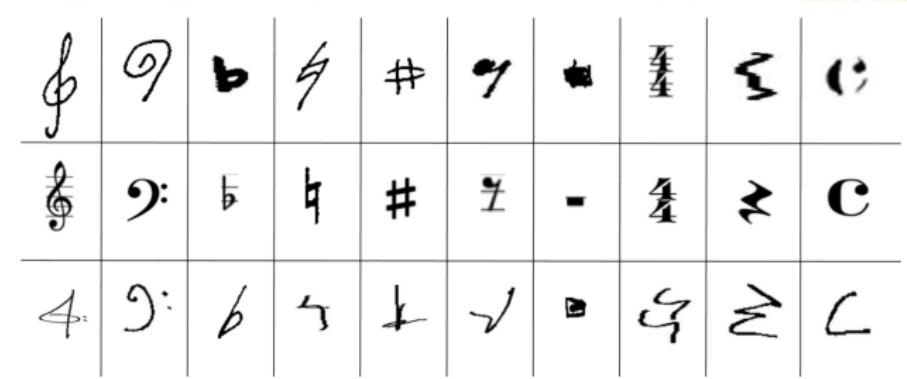


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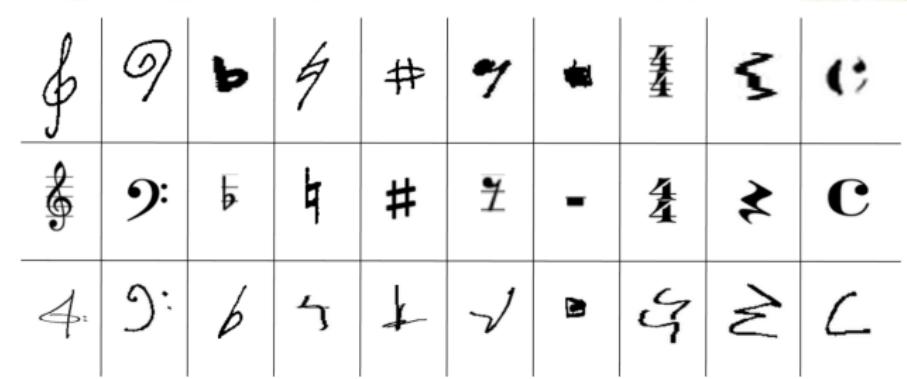
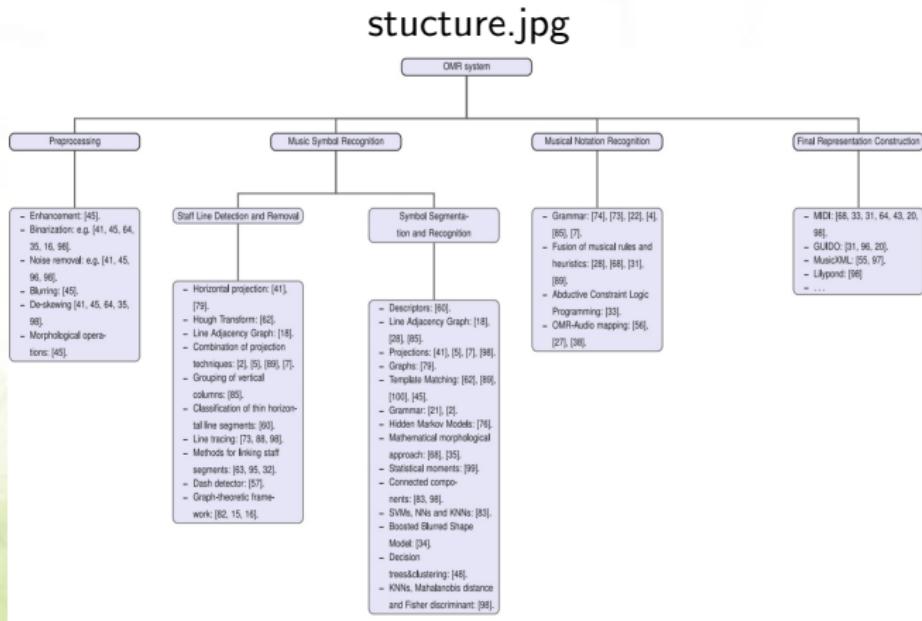


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## ❖ Musical Notation Construction and Final Representation:-

**Musical Notation Construction and Final Representation:-** It is the final stage that extract the musical semantics from the graphically recognized shapes and store them in a musical data structure.



**Figure: Summary Of Optical Music Recognition**

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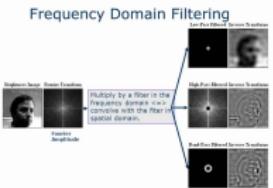


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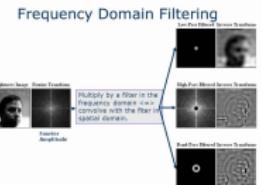
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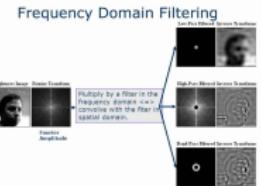
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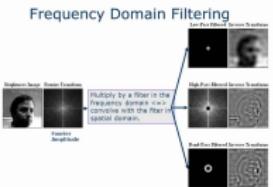
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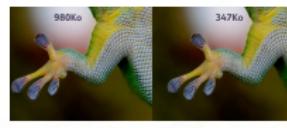
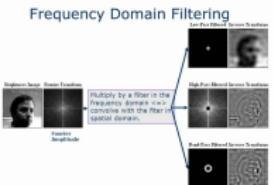
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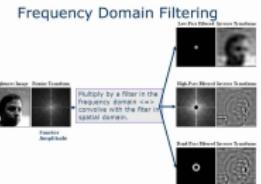
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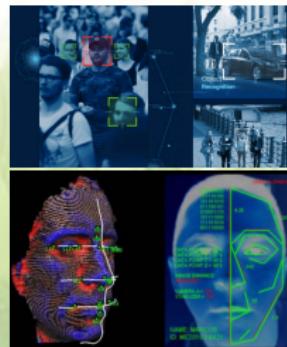
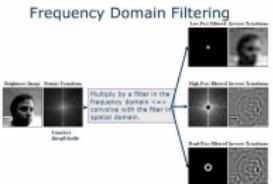
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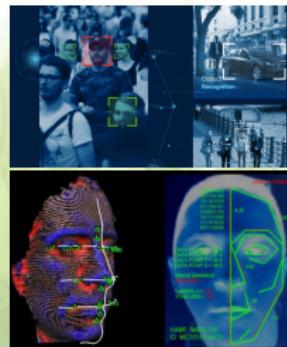
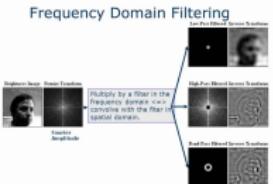
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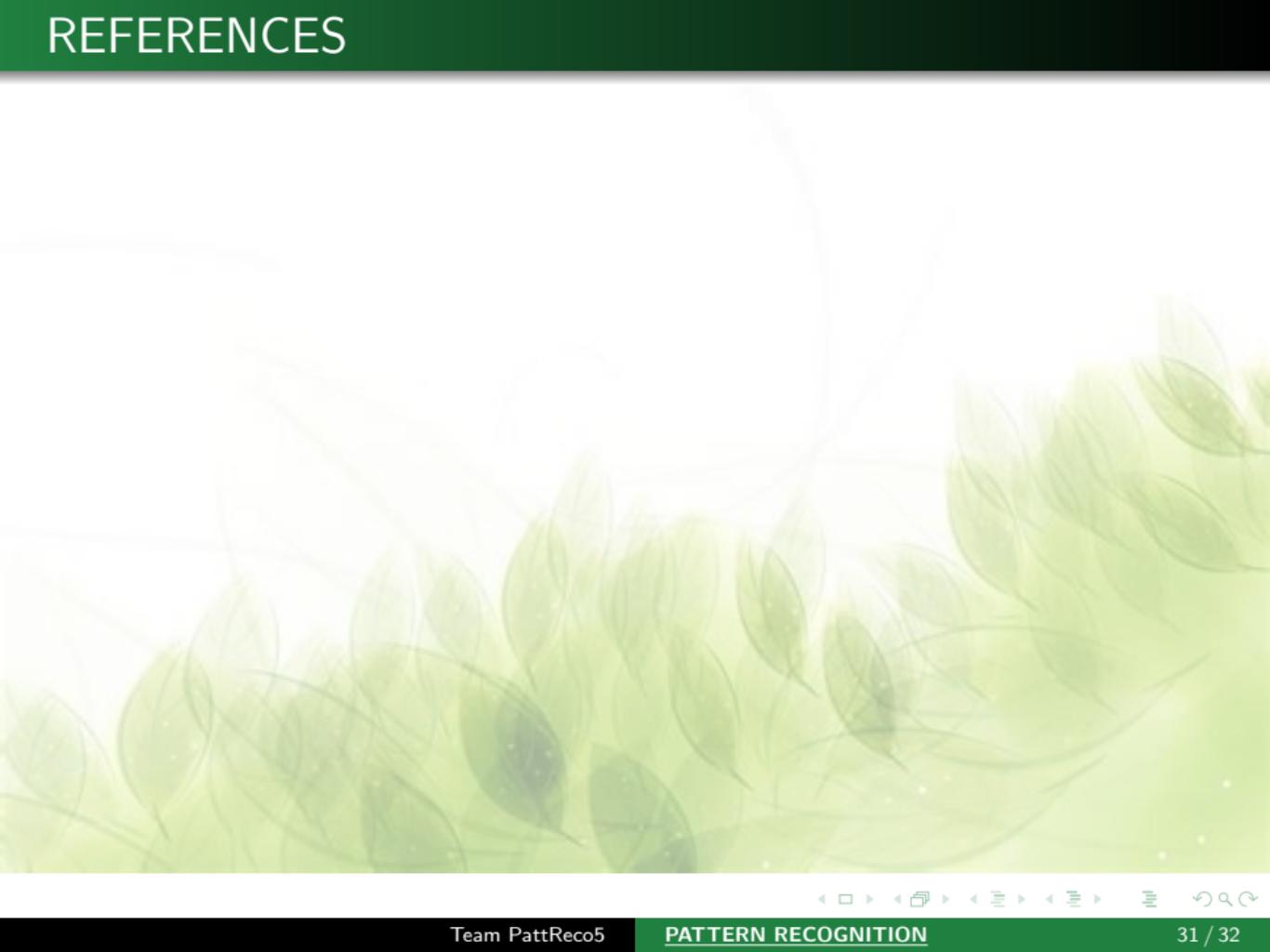


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-  Azriel Rosenfeld<sup>1</sup>, Harry Wechsler<sup>2</sup>, Received 19 December 1999, revised 30 March 2000, Center for Automation Research, University of Maryland, College Park, MD 20742-3275, Email: ar@cfar.umd.edu Department of Computer Science, George Mason University, Fairfax, VA 22030-4444, Email: wechsler@cs.gmu.edu

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Thank  
You