Resolution transfer in cancer classification based on amplification patterns

images/tree04.jpg
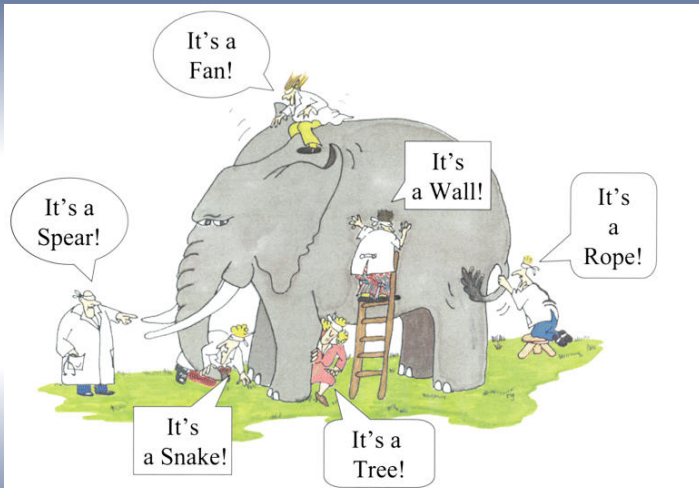
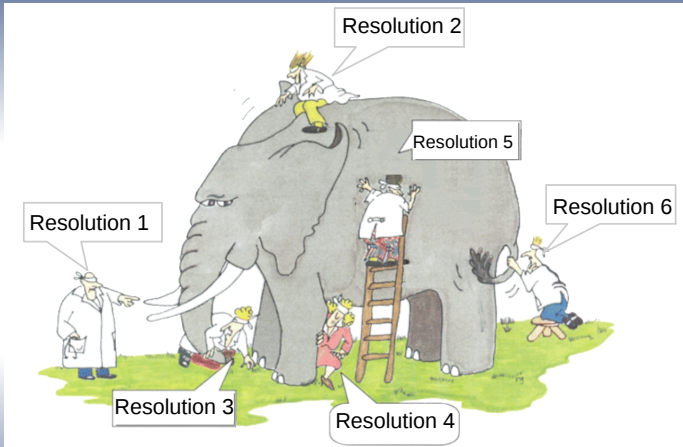**Prem Raj Adhikari**[1,2]   **Jaakko Hollmén**[1]

September, 2015

[1] Department Computer Science, Aalto University

[2] Department of Physiology, University of Turku

Elephant and the blind men

In Biology

Resolution 2

Resolution 5
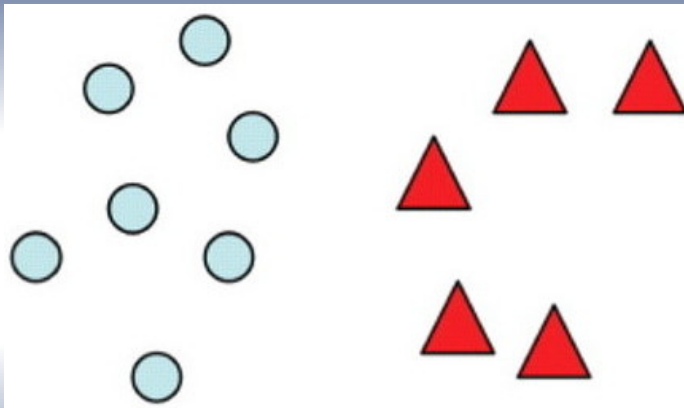
Resolution 1

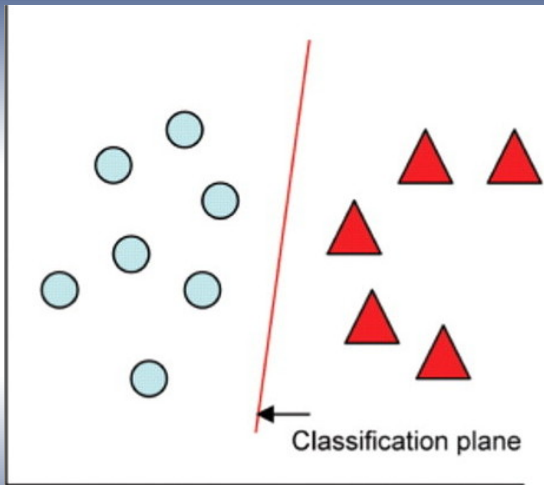Resolution 6

Resolution 3

Resolution 4

Adapted from Y. Moreau, University of Leuven, Belgium
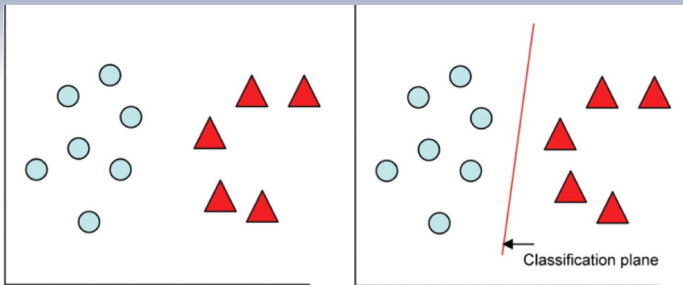
Labelled Data

Adapted from Anuj R. Shah, et. al., Bioinformatics (2008)

Supervised Learning

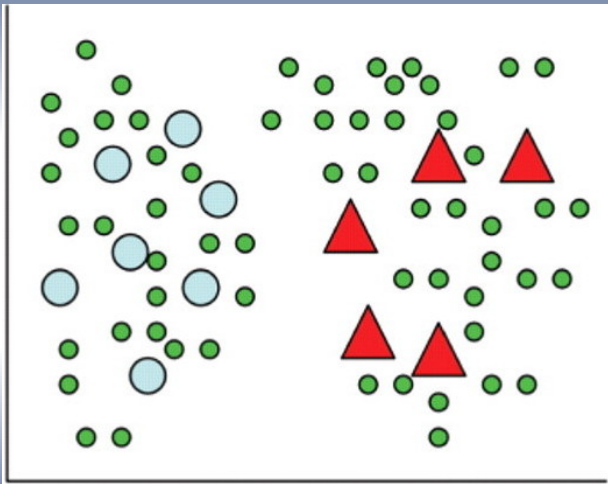Adapted from Anuj R. Shah, et. al., Bioinformatics (2008)

Supervised Learning

Classification plane

Adapted from Anuj R. Shah, et. al., Bioinformatics (2008)
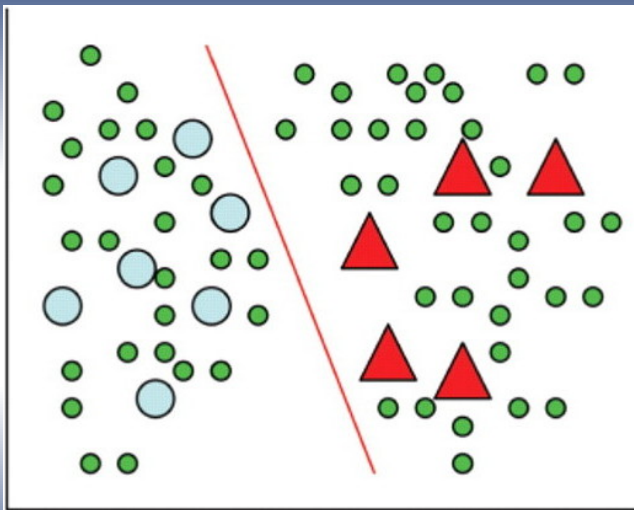
Unsupervised Learning

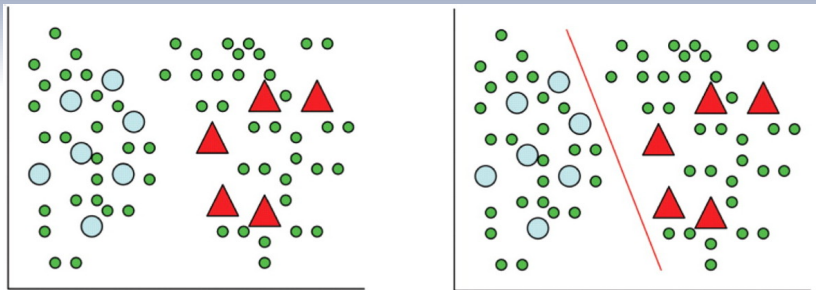Adapted from trendsofcode.net

Labelled and Unlabelled Data

Adapted from Anuj R. Shah, et. al., Bioinformatics (2008)

Semisupervised Learning

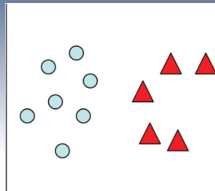Adapted from Anuj R. Shah, et. al., Bioinformatics (2008)

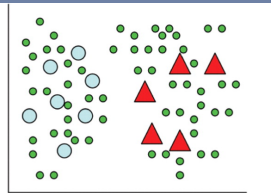# Semisupervised classification Paradigm

Adapted from Anuj R. Shah, et. al., Bioinformatics (2008)

Overall classification Paradigm

Labeled Data
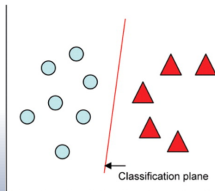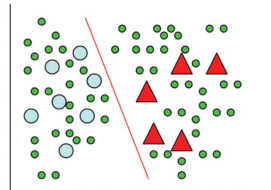(a)

Labeled and Unlabeled Data
(b)

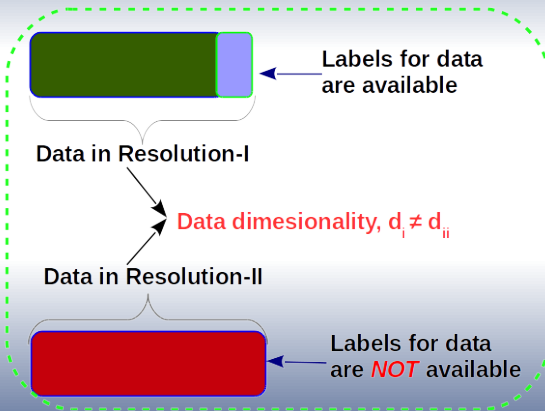Supervised Learning
(c)

Classification plane

Semi-Supervised Learning
(d)

Adapted from Anuj R. Shah, et. al., Bioinformatics (2008)

Challenge: Labelled and Unlabelled Datasets but Different Resolutions

How to classify data in different resolution given data and labels in some other resolution?

Labels for data are available

Data in Resolution-I

Data dimesionality, $d_i \neq d_{ii}$

Data in Resolution-II

Labels for data are *NOT* available

Solution: Probabilistic Modelling + Transformation