

Vasavi College of Engineering

Ibrahimbagh, Hyderabad-31

Department of Computer Science & Engineering

A Report on Guest Lecture on “**Markov Random Fields for Machine Learning-Applications in Image Segmentation**” delivered by Dr. Suryaprakash Kompalli
Conducted on Oct 21st, 2013.

A Guest Lecture on “Markov Random Fields for Machine Learning-Applications in Image Segmentation ” was delivered by Dr. Suryaprakash Kompalli , Applied Researcher, Microsoft, Hyderabad, India for the students audience of M-Tech (CSE) 1st and 2nd year on Oct 21st ,2013.

The objectives of the session were to discuss the following:

- Introduction to Machine learning in Image Processing Applications
- The Classification Problem
- Segmentation Problem
- Markov Random Fields
- Applications



The speaker started off the session with brief discussion on introduction to **Image Processing Applications** and how different image processing applications are categorized based on the type of input given and output produced by real time applications, the following are the categories

1) Input is image and output is also an image - Image Enhancement, Image Compression.

2) Input image and output is text - License plate recognition, Handwriting Recognition and optical character Recognition, Biometrics- face, Iris and fingerprint recognition.

3) Input is image + touch and output is 3DGraphics - Medical diagnosis, Virtual Surgery.

The Speaker has taken forward the session with the discussion application of machine learning in two important problems of image processing: classification and segmentation.

Classification: separates objects into groups. example: Industry application to separate red apples and green apples.

Classification consists of two steps:

- 1) Correct modeling of data.
- 2) Inferring class label from model.

Speaker has conveyed the various difficulties faced during classification of images, like many conditions arises while analyzing multiple features, more complex lines are needed for difficult problems.

Segmentation: This problem was explained taking the medical imaging problem - segmentation of organ from CT image.

The Markov Random Field (MRF) algorithm to perform segmentation and few applications of MRF with practical considerations using parallel processing was discussed during the session.

The speaker has concluded lecture by narrating the Applications - document processing, barcode, and medical imaging solutions that are useful in day to day life and their practical considerations.