

In This Issue. . .

- **Reader's Space:** Linear discrete system model to construct a classifier.
- **On-going research work:** Current research works done in pattern recognition and computational intelligence laboratory.

Dear friends! **COMPSIG NITT** is a monthly newsletter to share the research work done in the Pattern recognition and computational intelligence laboratory, Department of Electronics and Communication Engineering, National Institute of Technology Trichy.

Concepts, Ideas pertaining to Computational intelligence, Pattern recognition and Signal processing are also included in this newsletter.

We expect the feedback, comments and articles from you all.
Issue 2-8: August 2016

Team members

1. **Dr.E.S.Gopi, Co-ordinator**
2. **G.JayaBrindha, Ph.D. Scholar.**
3. **Neema.M, Ph.D. Scholar.**
4. **Rajasekharreddy Poreddy, Ph.D Scholar**
5. **Florintina.C, M.Tech, Communication systems.**
6. **Ankur Satpute, M.Tech, Communication systems.**

READER'S SPACE

In standard pattern recognition techniques, digital signal processing techniques are used only to extract features. The immense benefits of DSP are left unexploited. This project proposes to use classic DSP techniques in the process of constructing a classifier.

The classifier constructed here is a simple linear discrete system, to which the data as such is given as input, without any feature extraction. The output of the LTI system is exploited by the decision making device to classify the input. This system when put to test with the aid of toy clusters is able to produce a 60% success for hard doughnut cluster. When the kernel function is used, a 100% is obtained even for the hard doughnut cluster. This method of designing a classifier having the indispensable advantage of requiring very less storage space, might prove to be very useful in Big Data analysis.



Image courtesy: PIX4D-Drone Mapping Software, NIR dataset for Agriculture

In the process of testing the LTI system's credibility to act as an efficient classifier, NRI images of corn fields taken from satellites are being used currently. Out of the 520 images available, 10 images are randomly chosen. From each image, five 100×100 pixel blocks of the desired region (corn cultivated region) are randomly chosen and collected together and the process is repeated for the undesired region (barren land). The two classes of inputs thus collected are given as input to the LTI system in the form of vectors in order to train it. Once the training is complete, the other images are given as inputs to the trained system. The output is used to demarcate the corn cultivated field from the barren land.

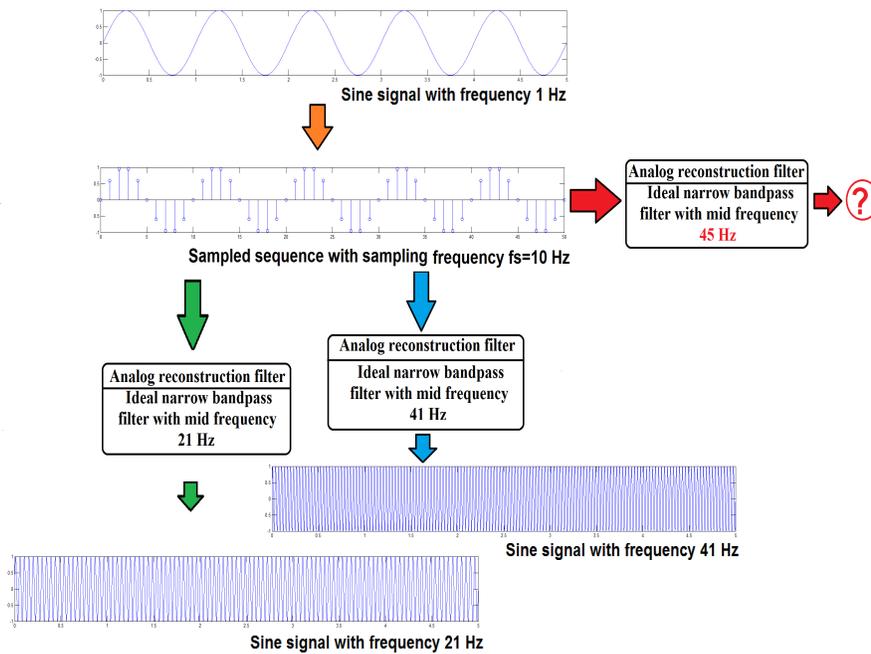
For further discussions contact: Ms. Florintina. C, M.Tech Communication Systems. Mail Id: florintinachaarlas@gmail.com

Link to the dataset: <https://Example Datasets Available for Download Agriculture>

[Back to Contents](#)

PUZZLE

Can you find the frequency of the output signal from the reconstruction filter with mid frequency 45 Hz?



ZOOM ZOOM



[Back to Contents](#)

Quotes

"Be more dedicated to making solid achievements than in running after swift but synthetic happiness." — Dr. A.P.J. Abdul Kalam

On going research work

- **Linear discrete system model to construct classifier for pattern recognition** The usage of classical DSP techniques are explored to construct a classifier and tested with the toy clusters. When the kernel function is used, a 100% is obtained even for the hard doughnut cluster.
- **Discrimination of plants and weeds from RGB images** The objective is to identify and locate the position of the intended plant from the images that are captured by robot and perform discrimination of plants and weeds. A classifier is constructed to classify leaves based on their texture.
- **Varietal identification of sunflower seeds** Various techniques for feature extraction such as boundary and fourier descriptors, dimensionality reduction through PCA, LDA and KLDA are experimented to find the most appropriate feature for varietal identification of sunflower seeds.

[Back to Contents](#)

Feedback

COMPSIG NITT invites articles and innovative ideas from readers for the [Reader's Space](#) column. We expect feedback and comments to monthly newsletter COMPSIG NITT. A facebook group, "[COMPSIGNITT](#)" is created for the readers to share their views. Those who are interested can send requests to the facebook group.

[Back to Contents](#)

Contact Information:

[Pattern Recognition and Computational Intelligence Laboratory](#),
Department of Electronics and Communication Engineering,
National Institute of Technology Trichy - 620015
E-mail: esgopi@nitt.edu