**Apoio**

UFPE
VIRTUS IMPAVIDA

UNIVERSITY OF COPENHAGEN

redeNIR

Rede Embrapa em Espectroscopia no Infravermelho
Próximo – Rede NIRS

PARA MAIS INFORMAÇÕES
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Embrapa   MINISTÉRIO DA
AGRICULTURA, PECUÁRIA
E ABASTECIMENTO   BRASIL
GOVERNO FEDERAL

Treinamento em análise de imagens hiperespectrais
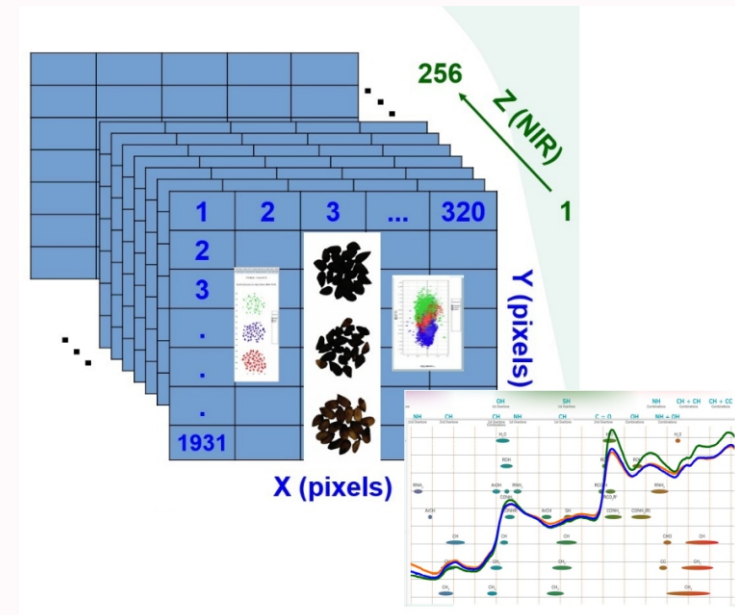
Período
20 a 24 de novembro de 2017

Carga horária
30 horas

Horário
8h às 11:30 h – 14h às 17:30 h

Local
Miniauditório da Embrapa Algodão

Objetivo

Capacitar profissionais em análise de imagens hiperespectrais utilizando o software HYPER-tools e promover parcerias institucionais.

Palestrante

Prof. Dr. José Manuel Amigo Rubio
Universidade de Copenhagen – Dinamarca

Programa

Hyperspectral Image Analysis

1. Hyperspectral Imaging. Introduction
 1.1. What is an image?
 1.2. RGB images and other color scales.
 1.3. Monochannel images. Gray scale images.
 1.4. Multispectral and Hyperspectral images.

2. Definition and Basic concepts
 2.2. VIS, NIR, MIR, Raman and other spectroscopies.
 2.2. General structure of a hyperspectral image.
 2.3. Commercial devices and types of measurements. Resolution issues.
 2.2. The need of Chemometrics.

3. Pre-processing
 3.1. Spectral preprocessing.
 3.2. Spatial preprocessing.
  3.2.1. Spatial Noise supresión
  3.2.2. Dead pixels, unwanted areas, etc.

4. Basic exploratory analysis
 4.1. Principal Component Analysis.
 4.2. Evolving Factor Analysis.

5. Screening techniques
 5.1. Correlations and autocorrelations.
 5.2. SIMPLISMA and other related methods.

6. Hyperspectral images resolution
 6.1. Multivariate Curve Resolution.
 6.2. Multi-image Curve Resolution.

7. Regression models
 7.1. Partial Least Squares.
 7.2. Classical Least Squares.
 7.3. Other related methods (SVM)

8. Segmentation
 8.1. Clustering techniques.
 8.1.1. K-means.
 8.1.2. Fuzzy clustering.

9. Classification
 8.2.1. SIMCA models
 8.2.2. PLS-DA

10. Image processing. Topology and features extraction
 9.1. Features of an image: Exectricity, particles couting, etc.
 9.2. Study of surface homogeneity.
 9.3. The concept of entropy.
 9.4. Fractals.
 9.5. Homogeneity Curves.

Important:
The course will be in ENGLISH
The students must bring their own laptops with Matlab 2014b or further version installed.
During the course, material will be given, and examples done by using HYPER-Tools