

# Industrial Project 2024: Plugin

Comprehensive Guide for Plugin Execution and Usage

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## 1 Introduction

The **Plugin** focuses on normalization of the hyperspectral images in Spectronon Software. This plugin enables the users to normalize hyperspectral images using two different methods.

## 2 Plugin Features

- **Normal:** Normal plugin applies standardization by scaling the data to have a zero mean ( $\mu$ ) and a unit standard deviation ( $\sigma$ ) using equation 1.

$$S_{\text{standardized}}(\lambda) = \frac{S_{\text{raw}}(\lambda) - \mu}{\sigma} \quad (1)$$

Where  $S_{\text{raw}}(\lambda)$  denotes raw spectral data at wavelength  $\lambda$ ,  $\mu$  represents mean of the raw spectra and  $\sigma$  is the standard deviation of the raw spectra.

- **Normalization using StandardScalar:** Applies standardization using **StandardScalar** from scikit learn library, which standardize features by removing the mean and scaling to unit variance.

## 3 Installation and Setup

### 3.1 Requirements

- Spectronon Software

### 3.2 Setup Instructions

1. Download the files (`Normal.py` and `Standard_Normalization.py`) from [Github](#).
2. Copy the files and place in Spectronon User Plugin Directory:

```
C:\Users\<UserName>\AppData\Local\SpectrononPro3\user_plugins\  
cube\user\
```

and select **”Reload Plugins”** from Spectronon’s file menu, Spectronon will add the custom analysis plugin to its menu system, as shown in Figure 1.

## 4 Plugin Usage

To use the plugins, load the datacube (hyperspectral image) and follow these steps:

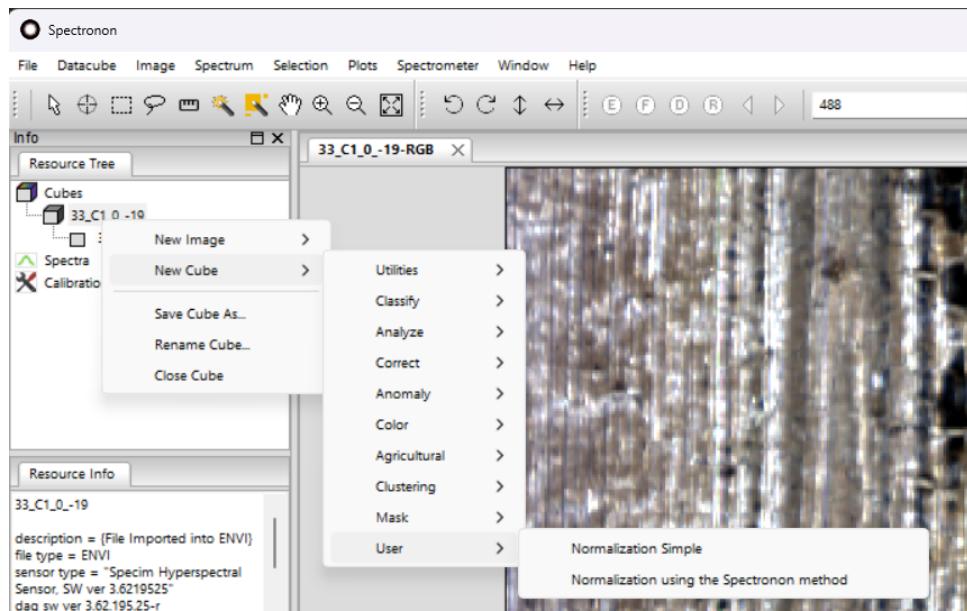


Figure 1: Plugin loaded in Spectronon software.

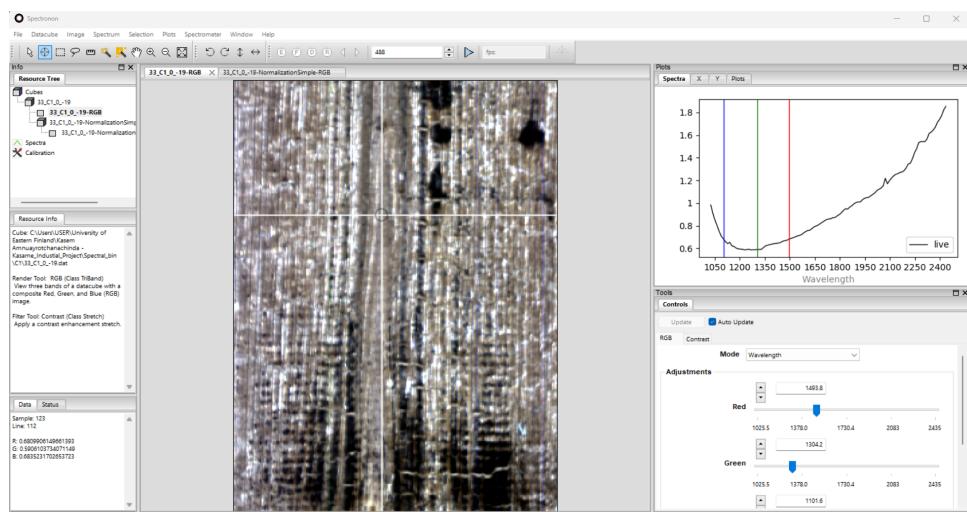


Figure 2: Original datacube.

## 4.1 Normal Normalization Plugin:

## 4.2 Spectronon Plugin:

## 5 Difference between Normal and Spectronon Plugin

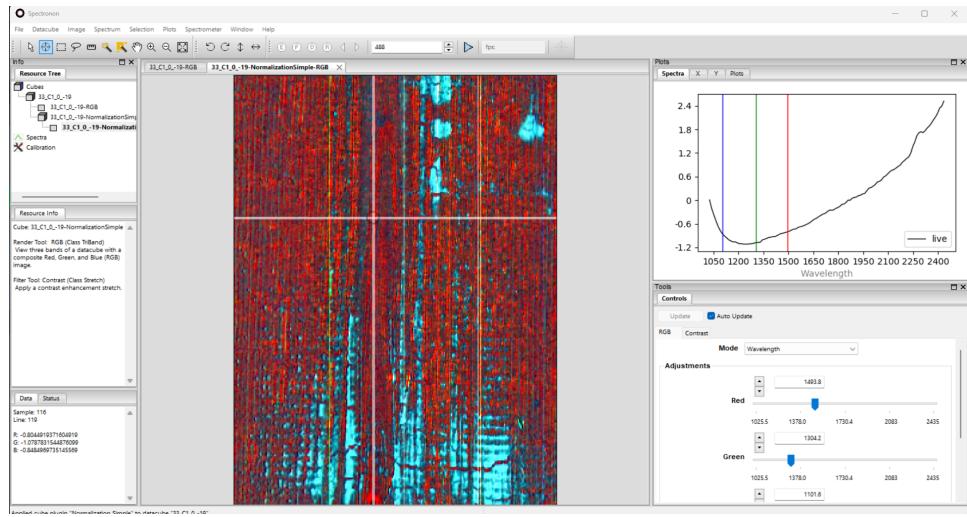


Figure 3: Datacube normalized using normal plugin.

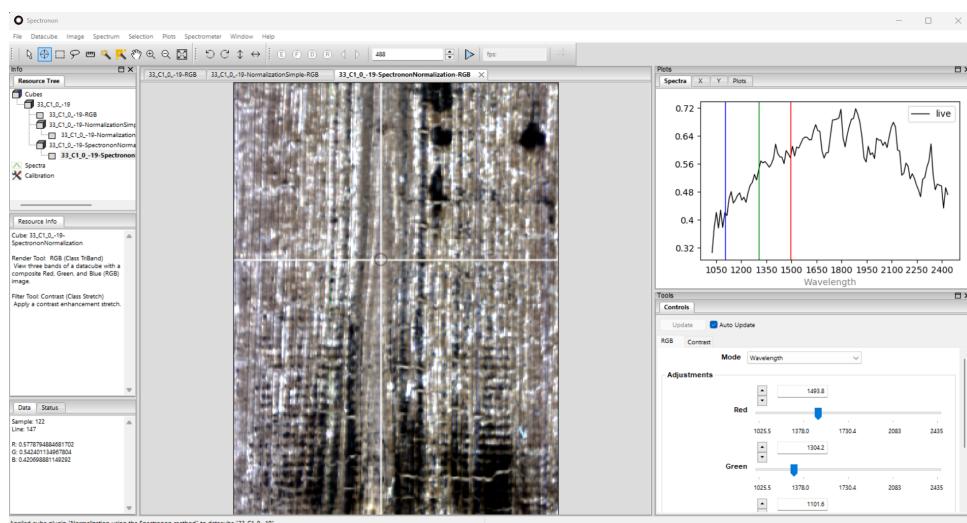


Figure 4: Datacube normalized using Spectronon plugin.