3D Rendering of Spectral Images

Color is the combination of many factors including spectral power distribution of the illumination, the spectral properties of the stimulus, and the spectral sensitivities of the observer. I have done the color calculation of each pixel on the basis of full spectral properties so this color calculation is more accurate than standard RGB model. I have reconstructed 3D objects with sufficient accuracy by using gray code projected patterns and rendered the calculated color in corresponding three dimensional points. Subsequently I have obtained Three Dimensional Spectral Rendering of the image by using extension of openGL in Visual C.

This method is useful in reverse engineering process and can be utilized in the industry for the inspection and quality control.

The following works I have done:
- Full measurement of spectral reflectance of objects using Imaging spectrograph.
- Shape Measurement and 3D reconstruction of the objects using gray code structured pattern. Data projector projects pattern and Imaging spectrograph captures the shape.
- Software developed for 3D rendering of Spectral Images using Visual C++ and openGL.

Basic features of software:
- Visualization of 3D reconstructed objects with or without spectral rendering.
- Rotation and scaling of the object.
- Plotting spectral reflectance of image just by pressing mouse on object surface.

-Position for 3D measurement. -Objects projected with pattern

Interface to the 3D Rendering of Spectral Images