Modeling Wildland Fire with DIRSIG

Abstract:

The purpose of this presentation is to describe a physics based fire model in DIRSIG. The main objective is to utilize research on radiative emissions from fire to create a 3D rendering of a scene to generate a synthetic multispectral or hyperspectral image of wildfire. These synthetic images can be used to evaluate detection algorithms and sensor platforms.

To produce realistic flame structures and realistic spectral emission across the visible and infrared spectrum, we first need to produce 3D time-dependent data describing the fire evolution and its interaction with the environment. Here we utilize an existing coupled atmosphere-fire model to represent the finescale dynamics of convective processes in a wildland fire. Then the grid-based output from the fire propagation model can be used in DIRSIG along with the spectral emission representative of a wildland fire to run the ray-tracing model to create the synthetic scene.

The technical approach is based on a solid understanding of user requirements for format and distribution of the information provided by a high spatial resolution remote sensing system.

Bio:

Zhen Wang received a Bachelor's degree in Optical and Electrical Engineering, then in 2000 she entered the Center for Imaging Science to pursue a Ph.D. degree in area of Digital Imaging Processing and Remote Sensing. She has published two papers:
1. Modeling Wildland Fire with DIRSIG (submitted to SPIE 2004)
2. Modeling Synthetic Remote Sensing Scenes Containing Wildland Fire (submitted to RS2004)