

1032-62-41

James Theiler* (jt@lanl.gov), MS-B244, Space and Remote Sensing Sciences, Los Alamos National Laboratory, Los Alamos, NM 87545. *Modified Machine Learning Framework for Anomalous Change Detection.*

Imagine two (or more) images taken of the same scene, but at different times and under different viewing conditions, possibly even with different cameras. Given these images, the aim is to find “interesting” changes that occurred in the scene during the time between when the images were taken.

There will be some differences in the images that are pervasive: perhaps due to overall contrast, brightness or focus differences, or maybe due to atmospheric or even seasonal changes. But there may also be changes that occur in only a few pixels. These rare changes are potentially indicative of something truly changing in the scene, and the idea is to use anomaly detection to find them. But it is important to identify the *changes* that are unusual, without being confounded by unusual pixels that are, in some sense, “similarly unusual” in both images.

A machine learning framework for anomaly (aka novelty) detection will be discussed, and a modification of that framework will be described. The modification distinguishes between “straight” anomalies and anomalous changes, and can be implemented by recasting the problem as one of binary classification between the observed image data and a background class that is obtained from a resampling of that original data. (Received July 26, 2007)