

Automated Classification of X-ray Sources in Stellar Clusters

Abstract

I am adapting and applying multivariate statistics and pattern recognition techniques for analysis of Chandra X-ray Observatory imaging spectroscopy of star formation regions. An automated classification technique is being developed to group pre-main sequence X-ray sources into clusters based on spectral attributes. The algorithm is being tested on deep ACIS images of the population of approximately 1000 X-ray emitting young stars in the Orion Nebula Cluster (ONC). Preliminary results from clustering on ONC sources demonstrate that an unsupervised method can be used to group X-ray sources into distinct classes, wherein members of a given class display similar spectral features. No a priori knowledge of the nature of each source was used to accomplish the clustering.

Bio

Susan M. Hojnacki received a BS in Electrical and Computer Engineering from Syracuse University, an MS in Computer Engineering and an MS in Imaging Science from the Rochester Institute of Technology (RIT). She is currently a doctoral candidate at the Center for Imaging Science at RIT. Since 1995, she has been a Research Scientist with the Eastman Kodak Company in Rochester, NY. While at Kodak, she developed several control systems for the Chandra X-ray Observatory and has worked on image processing algorithms for change detection, feature extraction, image segmentation, steganography, and compression of remotely sensed imagery.