

Emerging problems in pattern recognition: lessons and challenges

Alfred Hero
University of Michigan

Many emerging applications of pattern recognition (PR) involve complicated high-dimensional pattern spaces, small amounts of data-per-dimension, low signal-to-noise ratio, poorly specified statistical distributions, and anomalous statistical outliers. In some cases these difficulties are compounded by distributed data collection requirements that impose constraints on data integration and decentralized decisionmaking. This creates both challenges and opportunities for pattern recognition research. I will illustrate some of these challenges and possible solutions in several applications areas including: automated target recognition (ATR), gene microarrays, medical image registration, and network security.