

Presentation to the NSF Pattern Recognition Workshop in Ann Arbor,
March 15-17

I will outline what I see as the major challenges facing the field of pattern recognition. There are two sides to this problem:

- (i) Finding the right stochastic models for the most common 'patterns' found in images (or other signals such as language).
- (ii) Finding algorithms for doing Bayesian inference with them.

In the first category, I see 2 big challenges: finding the right ways to define stochastic context-sensitive grammars, e.g. for expressing the Gestalt laws and finding the right stochastic models for 'shape'. In the second category, I think understanding the limits of particle filtering and Bayesian belief propagation and integrating these two ideas are the most important challenges.