The Role of Uncertainty in Perceptual Organization

Submission ID   3000253

Submission Type Poster

Topic   Cognitive Science

Status   Submitted

Submitter   Yanli Zhou

Affiliation   New York University

SUBMISSION DETAILS

Presentation Type Either Poster or Oral Presentation

Presentation Abstract Summary Perceptual organization is the process of grouping scene elements into meaningful whole entities, for example line segments into contours. Some classic Gestalt principles of perceptual organization have been reframed in terms of Bayesian models, in which the observer computes the probability that the whole entity is present. These studies, however, leave open the possibility that people apply a fixed, learned stimulus-response mapping that mimics Bayesian inference. The alternative requires people to actually compute with probability distributions, i.e. flexibly take sensory uncertainty into account even when it varies from trial to trial. We distinguish between these hypotheses in a simple form of perceptual organization, namely judging whether two line segments separated by an occluder are collinear. We manipulate sensory uncertainty by varying retinal eccentricity. Probabilistic computation would imply that the observer takes the level of sensory uncertainty into account in deciding whether a measured offset between the line segments is due to non-collinearity or to sensory noise. We find that people indeed do so, providing the first evidence for probabilistic computation in perceptual organization.

Paper Upload (PDF) CCN abstract - Yanli,Luigi.pdf

Co-author Information

* Presenting Author

First Name	Last Name	Affiliation	E-mail
Yanli *	Zhou *	New York University	yanlizhou@nyu.edu
Luigi	Acerbi	Center for Neural Science, NYU	luigi.acerbi@nyu.edu
Wei Ji	Ma	New York University	weijima@nyu.edu

Keywords

Keywords

Perceptual organization
Bayesian inference
Bayesian modeling
Psychophysics
Perceptual decision making