

計算錯覚学国際シンポジウム・サテライトセミナー

2015年3月10日（火）16時～18時、明治大学中野キャンパス603研究セミナー室

Satellite Event for the International Symposium on Psychological vs Mathematical Approaches to Optical Illusion

## Joint Seminar on Optical Illusion

Time: 16:00-18:00 on March 10

Place: Seminar Room 603, 6th Floor, Meiji University Nakano Campus

Organized by: MIMS Collaborative Research Project for Visual Illusion and Mathematical Sciences

The following three invited speakers will kindly give us their second talks.

### **(1) 16:00-16:40**

**Simone Gori** ((Developmental and Cognitive Neuroscience lab, Department of General Psychology, University of Padua, Italy)

#### **Motion and luminance misperception due to self-motion.**

Luminance and motion illusions are normally observed in static patterns seen by static observers but some interesting phenomena can be experienced when a static pattern is dynamically perceived by an observer that is approaching the stimulus. Some illusions of the described above kind will be discussed and also the possible neural substrates will be proposed.

### **(2) 16:40-17:20**

**Dejan Todorović** (Laboratory of Experimental Psychology, Department of Psychology, University of Belgrade, Serbia)

#### **How shape from contours affects shape from shading**

Shading is a powerful cue for perception of 3D shape (relief), used by artists for hundreds of years to produce salient depictions of spatially complex objects. However, the manner in which perception of 3D relief is generated by 2D shaded figures is still not well understood. There are a few reports in the literature that perceived relief depends not only on the structure of shading but also on the shape of the contour of the shaded figure. In this talk I will present many examples, and the results of an experiment, that show how the same simple shading pattern can evoke a variety of saliently different perceived 3D reliefs, when delineated by different contours. A feature of such patterns is that their luminance distribution is essentially 1D, which greatly simplifies the mathematical analysis of possible 3D shapes corresponding to them. I will discuss the nature of ambiguity of information about 3D relief contained by shadings in such stimuli. A popular strategy to reduce this ambiguity, used in algorithms that attempt shape-from-shading recovery, is to estimate the direction of illumination of the 3D relief. The presented research suggests that shapes of contours of shaded figures provide an alternative source of disambiguation.

**(3) 17:20-18:00**

**Brian Rogers** (Department of Experimental Psychology, University of Oxford, Oxford, UK.  
Department of Psychology, St Petersburg State University, St Petersburg, Russia)

### **The New Moon illusion and the perception of straight lines**

When the sun is near the horizon and the moon is visible and higher in the sky, there is a compelling illusion that the sun is not in a direction perpendicular to the light/dark boundary of the moon, as is physically the case (Rogers and Anstis, 2015). Our explanation is that we make systematic errors in judging the straightness of lines that extend over large distances when there is insufficient 3-D information. To test this hypothesis, observers were asked to judge the alignment of three artificial 'stars' distributed across the 'sky' in the Saint Petersburg Planetarium. The outer 'stars' were separated in horizontal azimuth by 60deg, 90deg or 120deg with elevations of 20deg or 40deg. Observers adjusted the elevation of the central 'star' until it appeared to lie on an imaginary straight line joining the outer stars. Systematic errors were made, setting the central star below the physically correct position. Errors increased with horizontal separation of the outer stars and were largest in the 20deg elevation conditions. The results support our hypothesis that observers are forced to use the changing angular separation between straight and parallel lines to judge straightness when there is insufficient 3-D information (Rogers and Rogers, 2009).