



Discrete Tomography: Ghostbusters and Beyond

Silvia Pagani

Università Cattolica del Sacro Cuore, Brescia

13.30 - 21/05/2019

Università di Milano-Bicocca
Building U5 - Room 3014

Tomography deals with the inverse problem of recovering the internal of an object (also called image in the two-dimensional case) from the knowledge of its projections. Discrete tomography, in particular, refers to the fact that the image is a finite collection of pixels and projections are taken along lattice directions.

One of the main goals of tomography is to ensure that the reconstructed image actually equals the original one. The uniqueness issue has a negative answer in general, being the tomographic problem illposed. Ambiguities in the reconstruction are related to the presence of the so-called switching components, which are pairs of sets of pixels having the same projections along the considered directions. Starting from switching components, one defines a ghost as a nonzero image with null projections along a given set of directions.

In this talk I will present several ways of approaching ghosts, focusing on the features each viewpoint underlines. I will show how such a wealth in perspectives enables us to construct links between discrete tomography and other topics.

Keywords:

**discrete tomography • ghost • lattice direction •
switching component • uniqueness of reconstruction**

"Obvious" is the most dangerous word in mathematics.
- Eric Temple Bell

