

1152-55-41

Gregory Lupton* (g.lupton@csuohio.edu). *Digital Homotopy Theory*.

I will report on joint work with John Oprea and Nick Scoville, which consists of developing notions and techniques from homotopy theory in the setting of digital images.

An n -dimensional digital image is a finite subset of the integer lattice $\mathbb{Z}^n \subseteq \mathbb{R}^n$, together with an adjacency relation. For instance, a 2-dimensional digital image is an abstraction of an actual digital image consisting of pixels in the plane.

Many authors have introduced concepts from topology into the study of digital images. But some of these notions do not seem satisfactory from a homotopy point of view. Indeed, some of the constructs most useful in homotopy theory, such as cofibrations and path spaces, are absent from the literature. Working in the digital setting, we develop some basic ideas of homotopy theory, including cofibrations and path fibrations, in a way that seems more suited to homotopy theory. I will indicate how our approach may be used, for example, to study topological complexity in a digital setting.

This talk will introduce some of the basics of topological notions in the setting of digital images, and will not require any specialized background. (Received August 09, 2019)