1135-55-1282 **Nima Rasekh*** (`rasekh2@illinois.edu`), Department of Mathematics, Altgeld Hall, 1409 W Green Street, Urbana, IL 61801, and **Ruth Davidson**, **Rosemary Guzman**, **Chuan (Sophie) Du**, **Adarsh Manawa**, **Christopher Szul** and **Titan Wibowo**. *Analyzing RGB Images using Topology: How to use discrete Morse theory to study crime data.*

Being able to understand and compare images is as of yet a very computationally demanding task. A group at Australian National University recently developed an open source code that can detect fundamental topological features of a grayscale image in a computationally feasible manner. This is made possible by the fact that a computer stores a grayscale image as a cubical cellular complex, which can be studied using the techniques of discrete Morse theory. We expand the functionality of this code by analyzing images encoded in red, green and blue rather than just grayscale via specifically designed surjective functions that allow us to extract the desired key information via informative persistence diagrams. This system allows us to perform data analysis directly on RGB images that encode meaningful data, such as water scarcity maps or crime data maps. (Received September 20, 2017)

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