

1162-05-201

Ivan Contreras and **Andrew Tawfeek*** (atawfeek21@amherst.edu), 0401 Keefe Campus Center, Amherst College, Amherst, MA 01002. *Enumeration of Forman Equivalence Classes on Graphs.*

Discrete Morse theory has been developed over the past few decades, since its original formulation by Forman in 1998. We provide a novel approach to enumerating the Forman equivalence classes of discrete Morse functions on finite simple graphs and explicitly show that their generating function is given by the characteristic polynomial of the graph Laplacian Δ – and illustrate what this connection says about acyclic matching occurring on the Hasse diagram of the graph. Furthermore, we provide a discussion of our current research on generalizing our results to Forman equivalence classes on higher-dimensional simplicial complexes – and what can be said about the generating function in larger dimensions. (Received August 31, 2020)