

1046-57-1950      **Jason E Miller\*** (millerj@truman.edu), 100 E Normal St, Kirksville, MO 63501. *Relative Critical Sets: structure and application.*

Originally motivated by wanting to extend the concept of Blum’s medial axis to greyscale images in the hope of creating a method for describing shapes in medical images, the  $d$  dimensional relative critical set of a smooth function of  $n$  variables generalizes the critical set to a locus of codimension  $n - d$ . One might expect this locus of points to have a highly “irregular” structure, but it can be shown that except for at a set of codimension  $n - 2$ , relative critical sets of dimension  $d$  are smooth manifolds. The proof of this relies on techniques from singularity theory and knowledge of the geometry of the stratification of the space of real symmetric matrices. The structure theorem will be stated, some comments on its proof made, and some open questions posed and discussed. (Received September 16, 2008)